

**MILITARY VALUE DATA CALL  
TECHNICAL CENTERS**

<b>Category</b>	<b>Data Call #5</b>
<b>Technical Center Site</b>	<b>NRL-DC, SSC, MRY</b>
<b>Location/Address</b>	

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**REQUESTS FOR CLARIFICATION**  
From the Base Structure Analysis Team (BSAT)

Control #: 001  
To: Fred Esposito  
Fax: (703)696-5383

Activity: CNR  
Voice: (703)696-4613

Date sent: 8 SEP 94


enc (2)

**CLARIFICATION/CORRECTION REQUESTED for Data Call #5 Question #23**

To clarify ambiguities in responses to the above question, please provide the **CRIME RATES** for your surrounding community or county/township/parrish/city in these three categories: **Violent Crime Rate**  
**Property Crime Rate**  
**Drug Crime Rate**

Disregard previous format in question #23.  
Specify the rate per 100,000 population.  
Crime rates are expected to be obtainable from appropriate law enforcement offices.  
Data is needed for the activities listed on page 2.

NAVAL RESEARCH LABORATORY, WASHINGTON DC UIC: 00173

  
LT Christina May  
(703) 681-6491

**NOTE:** This information is needed urgently. Request you respond with clarification comments (below) or corrected page(s) within 24 hours after receipt at the activity. FAX a preliminary response directly to the BSAT at (703) 756-2174. Then, send your official response, properly certified, through your chain of command for certification and further forwarding to the BSAT. Official documentation must be retained to support your response and be available for validation by the Naval Audit Service.

Reply: Violent Crime Rate: 2868  
Property Crime Rate: 8702  
Drug Crime Rate: 996  
Jan 93 to Dec 93  
Information provided by District of Columbia Police Department

William C. Edwards Jr.                      NRL 1226.2                      (202) 767-2505                      9 Sept 94  
Name    Code    Commercial Phone #                      Date

## NAVAL RESEARCH LABORATORY - DC

1993 VIOLENT CRIME RATE  
Per 100,000 Population

Homicide	77
Rape	55
Robbery	1207
Aggregated Assault	<u>1529</u>
Total	2868

## PROPERTY CRIME RATE

Burglary	1958
Larceny	5342
Auto Theft	1368
Arson	<u>34</u>
Total	8702

## DRUG CRIME RATE

Drugs	996
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NAVAL RESEARCH LABORATORY - DC

1992 VIOLENT CRIME RATE  
Per 100,000 Population

Homicide	74
Rape	36
Robbery	1247
Aggregated Assault	<u>1432</u>
Total	2789

PROPERTY CRIME RATE

Burglary	1792
Larceny	5120
Auto Theft	1525
Arson	<u>72</u>
Total	8479

DRUG CRIME RATE

Drugs	974
-------	-----

1991 VIOLENT CRIME RATE  
Per 100,00 Population

Homicide	81
Rape	36
Robbery	1215
Aggregated Assault	<u>1121</u>
Total	2453

PROPERTY CRIME RATE

Burglary	2074
Larceny`	4869
Auto Theft	1360
Arson	<u>39</u>
Total	8342

DRUG CRIME RATE

Drugs	1240
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BRAC-95 CERTIFICATION

Reference: SECNAV NOTE 11000 dtd 8 Dec 93

In accordance with policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in the BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon, a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purposes of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to this package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

Richard M. Cassidy, Jr.  
NAME (Please type of print)  
Commanding Officer  
Title  
Naval Research Laboratory  
Activity

R.M. Cassidy  
Signature  
9/13/94  
Date

DATA CALL

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

\_\_\_\_\_  
NAME (Please type or print)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

\_\_\_\_\_  
NAME (Please type or print)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

MARC PELAEZ

\_\_\_\_\_  
NAME (Please type or print)

\_\_\_\_\_  
Signature

CHIEF OF NAVAL RESEARCH

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

OFFICE OF NAVAL RESEARCH

\_\_\_\_\_  
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)  
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

W. A. EARNER

\_\_\_\_\_  
NAME (Please type or print)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

NRL-DC  
BSAT Request for Clarification  
Control No.: 001

## **MILITARY VALUE MEASURES**

### **MISSION**

1. **Mission Statement.** State the officially assigned mission of this activity and cite the reference document(s) that assigns the mission.

**NRL-DC, SSC, MRY:** The mission of the Naval Research Laboratory is to conduct a broadly based multidisciplinary program of scientific research and advanced technological development directed toward maritime applications of new and improved materials, techniques, equipment, systems and ocean, atmospheric, and space sciences, and related technologies. In fulfillment of this mission, the Naval Research Laboratory:

a. Initiates and conducts scientific research of a basic and long-range nature in scientific areas of special interest to the Navy.

b. Conducts exploratory and advanced technological development deriving from or appropriate to the scientific program areas.

c. Within areas of technological expertise, develops prototype systems applicable to specific projects.

d. Performs scientific research and development for other naval commands, and where specially qualified, for other agencies of the Department of Defense, and in defense-related efforts, for other Government agencies.

e. Upon request from appropriate naval commands, assumes responsibility as the Navy's principal R&D activity in areas of unique professional competence.

f. Serves as the principal activity for the Navy and its contractors in providing accurate calibration, test, evaluation and reference standards services on acoustic transducers and materials.

g. Serves as the lead Navy activity for mapping, charting, and geodesy (MC&G) research and development for the Defense Mapping Agency.

2. **Joint Service Missions.** State any officially assigned joint/lead service assignments missions and cite the document(s) that assigned them.

N/A



## TECHNICAL FUNCTIONS

**3. Technical Functions Resource Allocations.** Appendix A provides a list of numbered functional support areas that cover the spectrum of naval warfare and support operations. Additionally, Appendix A provides a list of numbered life-cycle work areas that cover the "cradle to grave" spectrum of Navy systems acquisition. Utilizing the two lists at Appendix A, each activity will break out its entire FY1993 technical program within any applicable intersections of these two defining schemes (for example, functional support area #5.2 - life cycle work area #3 will identify the activity's level of resources allocated to sensors and surveillance systems, radar systems in advanced development). Definitions for each functional support and life cycle work area are provided in Appendix B for reference.

a. Use the form at Tab A of this data call to provide data on work years and expenditures for FY1993 to support each applicable intersection of functional support areas and life cycle work areas. When necessary, estimate data to the best of your ability

b. Similarly, use the Tab A forms to report separately on your detachments or sites that have not received this data call directly. This data may be consolidated when the detachments or sites perform work in the same area. When necessary, estimate data to the best of your ability.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.1 Undersea
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.28 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1469.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 679.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.1 Undersea
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.64 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 132

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 208.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.1 Undersea
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.25 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 799.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1867

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.1 Undersea
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.82 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 143.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: **In-House Expenditures** - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

**Out-of-House Expenditures** - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.1 Undersea
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.27 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 35

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 35

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.1 Undersea
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. \_0.53\_ WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 78.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 44.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.2 Aircraft
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.21 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 33.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.2 Aircraft
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.89 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 155.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 40

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 192

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.2 Aircraft
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.55 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 83.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 116.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 150

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.2 Aircraft
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.11 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 30.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 28.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.3 Surface Ship
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.46 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 156.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 200

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.3 Surface Ship
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 6.86 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 937.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 41.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 190.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.3 Surface Ship
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.14 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 24.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.3 Surface Ship
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.23 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1241.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 269

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 562.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.4 Space Satellites
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 6.97 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1261.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 237.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.4 Space Satellites
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.8 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 153.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 79.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.4 Space Satellites
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 64.2 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 13550.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 4723.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 21961.9

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.4 Space Satellites
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.4 Space Satellites
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 74

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.4 Space Satellites
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 50

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	1.4 Space Satellites
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.45 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 624.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K)

1441.3

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c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K)

2415.6

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Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	2.1 Gen Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.94 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 164.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 98

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	2.2 Guided Missiles
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.35 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 252.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 25.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	2.6 Directed Energy Systems
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 10.9 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2120.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 84.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	2.6 Directed Energy Systems
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.74 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 593.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 61.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	2.6 Directed Energy Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.89 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 177.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 50

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	2.9 Fire Control
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.14 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 40.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	3.1 Subsurface
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.08 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 170.94

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1397.88

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	3.3 Surface
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.37 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 68.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 80

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	3.3 Surface
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.05 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 125.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 50

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	3.3 Surface
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.58 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 393.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 37

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	3.3 Surface
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.3 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 48.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	3.4 Multiplatform
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.25 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 38.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.1 Landing Force Equipment and Sys
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.02 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.1 Landing Force Equipment and Sys
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.5 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 75.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 27.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.2 Coastal/Special Warfare Support
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.35 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 248.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 9.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.2 Coastal/Special Warfare Support
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.1 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 361.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 67

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 50

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.2 Coastal/Special Warfare Support
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.01 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 321.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 43.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 50

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.2 Coastal/Special Warfare Support
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.09 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 12.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.2 Coastal/Special Warfare Support
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.66 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 91.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 14.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	4.2 Coastal/Special Warfare Support
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.21 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 26.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 657.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.1 Sonar Systems
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.69 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 106.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 14.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.1 Sonar Systems
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 31.49 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 5422.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1482.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 731

Note: **In-House Expenditures** - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

**Out-of-House Expenditures** - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.1 Sonar Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 22.19 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 3441.

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 299.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2613

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.1 Sonar Systems
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.72 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 418

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 100

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.1 Sonar Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.87 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 112.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 10.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2210.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.1 Sonar Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.05 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 192.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 19.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 859.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.2 Radar Systems
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.14 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 851.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 10.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.2 Radar Systems
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 33.5 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 6167

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 541

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 647.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.2 Radar Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 23.63 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 4153.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 436.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2595.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.2 Radar Systems
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 24.34 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 3998.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 501.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1141.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.2 Radar Systems
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.53 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 103

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 13.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1110

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.2 Radar Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.22 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 378.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 142.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 95

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.2 Radar Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 25.37 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 4253.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1015.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1093.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.3 Special Sensors
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.18 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 780.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 386.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.3 Special Sensors
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 13.76 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2391

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 448.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1430.9

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.3 Special Sensors
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.04 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 727.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 85.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 164.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.3 Special Sensors
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 12.2 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1924.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 999.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 600

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.3 Special Sensors
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.05 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 17

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.3 Special Sensors
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.17 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 199

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 78

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.3 Special Sensors
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.54 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 468.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 421.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 298

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.4 Space Sensor/Surveillance Systems
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 20.39 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 4369.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2598.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.4 Space Sensor/Surveillance Systems
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 8.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1492.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 767.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1922

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.4 Space Sensor/Surveillance Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 88.26 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 19463

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 7469.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 20382.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.4 Space Sensor/Surveillance Systems
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.69 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 116.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 115.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1245.6

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.4 Space Sensor/Surveillance Systems
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.07 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 215.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 21.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 55

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.4 Space Sensor/Surveillance Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.3 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 637.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 188.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.4 Space Sensor/Surveillance Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 28.52 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 6027.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1706.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 14889.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.5 Ocean Surveillance
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.74 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 298.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 60

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.5 Ocean Surveillance
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 12.96 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2119.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 662.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 80.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.5 Ocean Surveillance
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 11.86 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1841.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 688.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1950.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.5 Ocean Surveillance
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 6.97 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1584.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 40.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.5 Ocean Surveillance
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.74 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 322.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 110

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 195

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	5.5 Ocean Surveillance
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.12 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 191.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 62.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.2 Aircraft Navigation Systems
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.05 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 216.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.2 Aircraft Navigation Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.09 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 12

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.3 Surface Ship Navigation Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 18.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.4 Weapons Navigation Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.23 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 59.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.5 Satellite Navigation Systems
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.74 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 548.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 203.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.5 Satellite Navigation Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.6 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 281.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 31

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 36

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.5 Satellite Navigation Systems
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.55 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 202.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 37

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 234.9

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.5 Satellite Navigation Systems
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.23 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 32.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.5 Satellite Navigation Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 100

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	6.5 Satellite Navigation Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.63 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 470.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 19.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 395.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.2 Airborne
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 10

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.2 Airborne
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 6.4 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1779.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 202.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 4361.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.2 Airborne
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.02 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 918.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 939.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 7956.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.3 Shipboard
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.05 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 7.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.3 Shipboard
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.56 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 317.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 61.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.3 Shipboard
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 14.72 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2533.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 317.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1609.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.3 Shipboard
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.48 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 69.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 275

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.3 Shipboard
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 100

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.3 Shipboard
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.63 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 402.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 24

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 245

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.3 Shipboard
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 7.08 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1043.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 494.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 393.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.4 Land-Based
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.58 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 507.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 216.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2479.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.4 Land-Based
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.09 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 13.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 12

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.4 Land-Based
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.14 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 16.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.4 Land-Based
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.71 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 102.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1251.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.5 Space Communications Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 16.02 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 3084.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 742.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.5 Space Communications Systems
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.94 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 146.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.5 Space Communications Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.64 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 144.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.5 Space Communications Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 34.58 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 7275.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2353.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2269.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.6 Non-Tactical Data Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 175

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.8 Intelligence Information Systems
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.5 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 76.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 27

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.8 Intelligence Information Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 24.73 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 5068.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1013.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 608.8

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.8 Intelligence Information Systems
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.85 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 134.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 89.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.8 Intelligence Information Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.42 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 183.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 25.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 669.7

Note: **In-House Expenditures** - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

**Out-of-House Expenditures** - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.8 Intelligence Information Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.45 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 689

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 137.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 167.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.1 Ballistic Missile Defense
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 30

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.1 Ballistic Missile Defense
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.09 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 30.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 24.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.1 Ballistic Missile Defense
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 18.95 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 4740.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 4493

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 4871.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.1 Ballistic Missile Defense
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 32

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.2 Countermeasures (CM)
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.02 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 713.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 466

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.2 Countermeasures (CM)
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 35.29 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 5380

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 3650

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 955.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.2 Countermeasures (CM)
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 32.2 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 6139.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1756.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1330.9

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.2 Countermeasures (CM)
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 15.13 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2754.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 872.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 360

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.2 Countermeasures (CM)
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.17 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 177.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 130

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 56.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.2 Countermeasures (CM)
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 479.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 45

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.2 Countermeasures (CM)
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 14.01 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2308

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 744.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2500.8

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.3 Electronic Warfare (EW) Systems
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.31 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 519.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 58.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.3 Electronic Warfare (EW) Systems
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 47.15 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 7649.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1910.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 3906.6

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.3 Electronic Warfare (EW) Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 70.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 11559.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 4068

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 6668.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.3 Electronic Warfare (EW) Systems
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 61.57 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 12304.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 4195.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2781.6

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.3 Electronic Warfare (EW) Systems
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.25 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 34.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 25

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 67.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.3 Electronic Warfare (EW) Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.3 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 34.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 100

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 397

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	8.3 Electronic Warfare (EW) Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 21.66 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 4121.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1805.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 3904.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	9.1 Navy Strategic Systems
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.9 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1346.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. Do not include direct cite funding. \$(K) 2579.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	9.1 Navy Strategic Systems
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.14 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 21.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 15

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	9.1 Navy Strategic Systems
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.21 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 180.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	9.2 Nuclear Weapons and Effects
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.79 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 649.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 223.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	9.2 Nuclear Weapons and Effects
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 34.28 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 10978.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 4259.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1067.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.1.2 Aircraft-Related Training Systems
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.16 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 25.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.1.3 Surface Ship-Related Training Sys
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.68 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 671.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 26.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 120

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.1.5 Human Resources Research and Dev
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.11 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 14.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.3 Facilities Engineering
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.02 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 122

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.3 Facilities Engineering
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.55 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 160.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 59

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 250

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.3 Facilities Engineering
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.39 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 56

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 700

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.5 Environmental Descrip Pred& Eff
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 164.82 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 30075.16

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K)13402.92

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 50

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.5 Environmental Descrip Pred& Eff
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 89.29 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 13113.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 7440.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2256.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.5 Environmental Descrip Pred& Eff
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 90.07 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 16492.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 10144.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 5613.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.5 Environmental Descrip Pred& Eff
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 18.24 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2728

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1626.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1161

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.5 Environmental Descrip Pred& Eff
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.67 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 367.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 10

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 4.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.5 Environmental Descrip Pred& Eff
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 8.68 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1516.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 493

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 388

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.5 Environmental Descrip Pred& Eff
Life Cycle Work Area	ANALYSIS

**Note:** An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 8.16 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1462.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2215.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2599.8

**Note:** In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

**Out-of-House Expenditures** - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6 Crew Equipment and Life Support
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.94 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 187.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 175

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6.1 Submarine
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.09 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 19.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6.3 Surface Ship
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 50

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6.3 Surface Ship
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.9 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 541.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 435.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 184

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10. 6.3 Surface Ship
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 13.23 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1940.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 945.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 513.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6.3 Surface Ship
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.47 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 477.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 158.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 611.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6.3 Surface Ship
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. \_0.23\_ WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 39.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6.3 Surface Ship
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.13 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 363.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 30.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 57

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.6.4 Med Rsrch & Combat Casualty Care
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.41 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 103.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 74.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.8 Other Subsidiary Systems or Comp
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.07 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 7.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.8 Other Subsidiary Systems or Comp
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.02 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 3.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.8 Other Subsidiary Systems or Comp
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.34 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 96.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 20.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.9 Activity Mission and Function Sup
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.04 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 405.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 394.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.9 Activity Mission and Function Sup
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 186.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 68.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.9 Activity Mission and Function Sup
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.96 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1375.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 282.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 157

Note: **In-House Expenditures** - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

**Out-of-House Expenditures** - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.9 Activity Mission and Function Sup
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.44 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 193.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 71.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 50

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.9 Activity Mission and Function Sup
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.57 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1386.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 33.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	10.9 Activity Mission and Function Sup
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 30.6 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 8517.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 952.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1459.9

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.1 Computers
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.46 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 822.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2425.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1700

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.1 Computers
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 79.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2451.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.1 Computers
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 24.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 2982

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 453.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 679.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.1 Computers
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 612.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.1 Computers
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.94 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 300.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 17.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.1 Computers
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.71 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 102.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 8302

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.10 Other Technology Base Programs
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 23.95 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 10438.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 392.8

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 108.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.10 Other Technology Base Programs
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.76 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 3,001.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 5,163.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 773.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.10 Other Technology Base Programs
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 45.52 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 6241.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2614.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 3175.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.10 Other Technology Base Programs
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.17 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 356.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 47

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 60

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.10 Other Technology Base Programs
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.23 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 61

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 52

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 100

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.10 Other Technology Base Programs
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.1 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 349.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 266.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.2 Software
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 25.07 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 4049.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 189.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 49.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.2 Software
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 37.62 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 6278.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 2435.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1167.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.2 Software
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 14.99 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1977.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 646.4

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 3239.6

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.2 Software
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.78 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1442.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 260.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 729.5

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.2 Software
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.11 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 13.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 358.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.2 Software
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 9.87 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1524.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 422.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 395

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.2 Software
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 76

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 249.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 425.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.3 Communications Networking
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 6.63 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1011.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 189.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 75

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.3 Communications Networking
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.93 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 454.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 85.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 191.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.3 Communications Networking
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.3 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1199.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 489.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 963

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.3 Communications Networking
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 12.48 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1772.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 46

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.3 Communications Networking
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 7.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 1062.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 6.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 714.6

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.4 Electronic Devices
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 48.11 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 8436.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 192.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 22.7

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.4 Electronic Devices
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 42.9 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 8841.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1738.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 24819.6

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.4 Electronic Devices
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 31.67 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 4691.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 854.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 12157.3

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.4 Electronic Devices
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.32 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 64.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.4 Electronic Devices
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.27 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 39.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 67.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.4 Electronic Devices
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.64 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 130.3

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 15

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.4 Electronic Devices
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 4.36 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 799.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 228.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 775.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.5 Materials and Processes
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 190.44 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 35644.5

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1656.9

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 3220.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.5 Materials and Processes
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 62.05 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 11888.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 3740.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 9182.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.5 Materials and Processes
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 40.84 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 7077.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1843.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 5539.2

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.5 Materials and Processes
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.01 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 314.2

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 112.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 325

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.5 Materials and Processes
Life Cycle Work Area	6.5

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 52.4

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.5 Materials and Processes
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.04 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 567.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 125.7

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 567.9

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.5 Materials and Processes
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 5.9 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 983.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 117

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 245

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.6 Energy Storage
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.64 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 91.1

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 11.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.6 Energy Storage
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.12 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 180.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 178.3

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.6 Energy Storage
Life Cycle Work Area	ANALYSIS

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 89.7

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.7 Propulsion and Energy Conversion
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.43 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 672.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 137.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.7 Propulsion and Energy Conversion
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. \_0\_ WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 38.6

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 153.2

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 255.6

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.7 Propulsion and Energy Conversion
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.1 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 256.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 111.5

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.8 Design Automation
Life Cycle Work Area	6.1

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 3.7 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 879.4

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 65

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 0

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.



**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.8 Design Automation
Life Cycle Work Area	6.2

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 0

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 20

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 4196.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.8 Design Automation
Life Cycle Work Area	6.3

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 2.54 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 382.8

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1188.6

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 514.1

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.8 Design Automation
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.14 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 15

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 20

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 455

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	11.8 Design Automation
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 3.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 140

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.2 Airborne
Life Cycle Work Area	6.4

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 1.39 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 248.7

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 2205.7

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

**TECHNICAL FUNCTIONS  
FUNCTIONAL SUPPORT AREA/LIFE CYCLE WORK AREA FORM**

Technical Center Site	NRL-DC/SSC/MRY
Functional Support Area	7.2 Airborne
Life Cycle Work Area	6.6

Note: An example of a functional support area - life cycle work area is "1. Platform, 1.1 Undersea, - 10. Program Support".

1. **In-House Work Years.** Provide the number of in-house government employee (civilian and military) work years for FY1993 that were performed in this functional support area - life cycle work area. Workyears are to be consistent with those used in the preparation of inputs to the President's budget. 0.71 WYs

2. **Expenditures**

a. **In-House Expenditures.** Provide the total in-house cost in FY1993 for this functional support area - life cycle work area. \$(K) 113.9

b. **Out-of-House Expenditures.** Provide the total funds expended during FY1993 For this functional support area - life cycle work area. **Do not** include direct cite funding. \$(K) 0.1

c. **Direct Cites.** Provide total direct cite funds expended on contract during FY1993 for this functional support area - life cycle work area. \$(K) 1328.8

Note: In-House Expenditures - Is comprised of the total obligation authority for direct labor, direct material, direct travel, direct equipment, direct computer support, other direct support services and all overhead.

Out-of-House Expenditures - Is comprised of total obligational authority for direct work (customer funded, mission oriented) performed or to be performed by other than the organizational entity. Out-of-house performers may include other departmental or DoD organizational entities, industrial firms, educational institutions, not-for-profit institutions and private individuals.

## MANPOWER

### **4. Work Breakdown Structure**

a. Use Table 4.1 (below) to provide data on the general support functions at your activity. Report data as of 31 March 1994. If you are collocated with one of your subordinate base keeper commands (i.e., a NAWS or NAS collocated with a NAWC Division), describe the differences in the functions of each and provide a separate Table 4.1 for the subordinate command. Include this command in the Table 4.1 submission for your Activity.

b. Similarly, use Table 4.2 (below) to provide general support function data for all your detachments or sites that did not receive this data call directly. Consolidate data from all of these detachments into one table (4.2). Provide a list of the detachments whose data is included in Table 4.2. For each identified detachment in this list, include its name, location, UIC, and number of civilian and military personnel onboard.

In addition, if any of your detachments or separate sites not receiving an individual data call have over 50 civilian personnel or own technical facilities, provide separately a description of the site, the functions performed there, photographs showing the facilities and state the reason for that site's existence and the necessity for it to be at that location.

c. Use Table 4.3 (below) to provide estimated data, for your activity only, to reflect the anticipated impact of previous BRAC decisions that have not yet been implemented. This data should provide the deltas from Table 4.1.

### **NOTES:**

[1] Use the following definitions when providing data for the tables below:

Workyears: Consistent with those used in the preparation of inputs to the President's budget.

Contract Workyears: Actual or estimated workyears performed by support contractors with workyears defined consistent with the definition used in the President's budget.

Civilian Personnel Onboard: Full Time Permanent (FTP) employees.

[2] Any categories of personnel that are employed to support other Activities should be noted with the name of the additional Activity supported.

**Table 4.1, General Support Resources for  
(Activity: NRL-DC.SSC. MRY) (UIC:N00173) (Note 1)**

Function	Space allocated (Gross SQFT)	Work Years	Civilian Personnel on-board	Contract Work Years	Military Personnel Onboard	
					Off	Enl
<b>ADMINISTRATION</b>						
Command (CO/XO/TD/etc.)	11,3467	11.3	11	0	2	0
Comptroller	13,759	81.6	76	0	0	0
Admin	130,743	233.5	225	0	1	3
Human Resources	22,825	81.0	60	0	0	0
<b>OPERATIONS SUPPORT</b>						
Supply Management	94,078	176.9	173	0	1	0
Consolidated Computational Computer Support	33,848	51.3	49	0	0	0
Information Systems and Communications	8,567	24.0	22	0	0	1
Safety/OSH/Environmental	14,192	33.5	32	0	0	0
<b>INFRASTRUCTURE</b>						
Physical Security	6,000	51.0	49	0	0	0
Public Works/Staff Civil Engr	93,364	160.8	150	0	1	0
Fire Protection	0	0	0	0	0	0
Medical/Dental	0	0	0	0	0	0
Military Support	931	0	0	0	0	1
Air/Waterfront Operations	0	0	0	0	0	0
Other	0	0	0	0	0	0
<b>TECHNICAL STAFF</b>						
Technical Operations			2,077	Note 6	24	0
<b>Totals</b>	<b>429,654</b>	<b>904.9</b>	<b>2,924</b>	<b>Note 6</b>	<b>29</b>	<b>5</b>

**Note 1:** Information reported covers NRL-main site only (e.g., excludes all detachments and filed sites).

**Note 2:** The Human Resources Office, NRL Stennis Space Center, also provides support to the Naval Meteorology and Oceanography Command and the Naval Oceanographic Office.

**Note 3:** Supply management includes commercial contracting function.

**Note 4:** Public Works space includes unoccupied space undergoing rehabilitation, repair and reassignment.

**Note 5:** Technical Operations include direct technical as well as technical support (i.e., production overhead).

**Note 6:** Contract workyears by function supporting NRL mission operations are not recorded in NRL financial or personnel systems and are therefore not available. Contracts include material, travel, equipment and services for off-site and on-site contractor personnel. Consequently, development within the allowed time constraint was not feasible.



**Table 4.2, General Support Resources for all Detachments  
(Activity: NRL-DC, SSC, MRY) (UIC: N00173) (Note 1)**

Function	Space allocated (Gross SQFT)	Work Years	Civilian Personnel on-board	Contract Work Years	Military Personnel Onboard	
					Off	Enl
<b>ADMINISTRATION</b>						
Command (CO/XO/TD/etc.)					2	0
Comptroller	568	0	0			
Admin	8,717	32.3	29			
Human Resources	8,608	25.7	23			
<b>OPERATIONS SUPPORT</b>						
Supply Management	11,034	20.1	18			
Consolidated Computational Computer Support	0	0	0			
Information Systems and Communications	604	4.5	4			
Safety/OSH/Environmental	922	2.2	2			
<b>INFRASTRUCTURE</b>						
Physical Security	1,180	0	0			
Public Works/Staff Civil Engr	35,601	14.1	13		1	0
Fire Protection	4,100	11.8	11			
Medical/Dental						
Military Support					0	1
Air/Waterfront Operations	2,098					
Other						
<b>TECHNICAL STAFF</b>						
Technical Operations			397	Note 6	31	135
<b>Totals</b>	<b>73,432</b>	<b>110.7</b>	<b>497</b>	<b>Note 6</b>	<b>34</b>	<b>136</b>

**Note 1:** Information reported covers NRL detachments and field sites other than the NRL Underwater Sound Reference Detachment, Orlando, FL, which is being reported separately. In general, field sites are used to conduct research, experiments, and projects that cannot be accommodated at the main site. NRL field sites and detachments are totally integrated within the main site organizational structure, e.g., no Commanding Officer or Officer-In-Charge (OIC), with the exception of the Flight Support Detachment, Patuxent River, MD, which has an OIC. Note also that many field sites do not have separate UICs for financial, plant property, and administrative purposes. 2. The Human Resources Office, NRL Stennis Space Center, also provides support to the Naval Meteorology and Oceanography Command and the Naval Oceanographic Office. 3. Supply management includes commercial contracting function. 4. Public Works space includes unoccupied space undergoing rehabilitation, repair and reassignment. 5. Technical operations include direct technical as well as technical support, i.e., production overhead. 6. Contract

workyears by function supporting NRL mission operations are not recorded in NRL financial or personnel systems and are therefore not available. Contracts include material, travel, equipment and services for off-site and on-site contractor personnel. Consequently, development of a realistic estimate that would meet BRAC certification requirements within the allowed time constraint was not feasible.

**List of Detachments Whose Data is In Table 4.2:**

<u>Name and Location</u>	<u>UICs</u>	<u>Civilians On-Board</u>	<u>Military On-Board</u>
NRL Stennis Space Center Det Bay St. Louis, MS	N68462	369	6
NRL Monterey Field Site Monterey, CA	N66856	61	6
NRL Flight Support Detachment Lexington Park, MD	N48498 N31686	4	98
NRL Chesapeake Bay Field Site Chesapeake Bay, MD	N31260	27	0
NRL Field Site Falcon AFB Colorado Springs, CO	N47556	6	4
NRL Space Tracking Field Site Lompoc, CA	N/A	1	0
NRL Key West Field Site Key West, FL	N00213	2	0
NRL Mobile Bay Field Site Mobile, AL	N/A	4	0
Pomonkey Field Site Pomonkey, MD	N/A	6	0
Waldorf Field Site Waldorf, MD	N/A	1	0
Blossom Point Field Site Blossom Point, MD	N/A	7	0
NRL Field Site Aberdeen Aberdeen, MD	N47146	0	1
Midway Research Field Site Quantico, VA	N/A	1	0
Other Sites (Not specified because only one person assigned or because of security reasons).	N/A 8	55	

**Table 4.3, Previous BRAC Impact to General Support Resources for  
(Activity: NRL-DC, MRY, SSC ) (UIC: N00173)**

Function	Space allocated (Gross SQFT)	Work Years	Civilian Personnel on-board	Contract Work Years	Military Personnel Onboard	
					Off	Enl
<b>ADMINISTRATION</b>						
Command (CO/XO/TD/etc.)						
Comptroller						
Admin						
Human Resources						
<b>OPERATIONS SUPPORT</b>						
Supply Management						
Consolidated Computational Computer Support						
Information Systems and Communications						
Safety/OSH/Environmental						
<b>INFRASTRUCTURE</b>						
Physical Security						
Public Works/Staff Civil Engr						
Fire Protection						
Medical/Dental						
Military Support						
Air/Waterfront Operations						
Other						
<b>TECHNICAL STAFF</b>						
Technical Operations						
Totals						

**ANSWER: NONE**

**5. Technical Staff Qualifications**

a. Use Table 5.1 (below) to provide data on the civilian personnel allocated to Technical Operations having the educational and experience levels indicated in the table for your activity. Report data as of 31 March 1994. Similarly, use Table 5.2 (below) to provide data for all your separate detachments or sites that did not receive this data call directly. Consolidate data from all of these detachments into one table (5.2). Provide a list of the detachments whose data is included in Table 5.2.

**Table 5.1, Technical Staff Education Level for  
(Activity: NRL-DC/MRY/SSC (FTP)) (UIC: 00173)**

Highest Degree Attained	Years of Government and/or Military Service					Total
	Less than 3 Years	3-10 Years	11-15 Years	16-20 Years	More than 20 Years	
Grade School						
High School	39	377	215	190	477	1298
B.A./B.S	59	324	100	54	175	712
M.A./M.S	35	146	74	60	161	476
Ph.D./M.D.	98	251	143	109	270	871
Total	231	1098	532	413	1083	3357

**Table 5.2, Technical Staff Education Level for all Detachments  
(Parent Activity: NRL-ORL (FTP)) (UIC: N00173)**

Highest Degree Attained	Years of Government and/or Military Service					Total
	Less than 3 Years	3-10 Years	11-15 Years	16-20 Years	More than 20 Years	
Grade School						
High School	2	18	13	10	23	66
B.A./B.S		9	3	1	8	21
M.A./M.S	1	3	1	2	4	11
Ph.D./M.D.	2	4	2	2	7	17
Total	5	34	19	15	42	115

b. Use Table 5.3 (below) to provide data on the number of civilian personnel allocated to Technical Operations with graduate degrees and at least three years of applicable experience that have their highest degree in the fields indicated. Report data as of 31 March 1994. Similarly, use Table 5.4 (below) to provide data for all your separate detachments or sites that did not receive this data call directly. Consolidate data from all of these detachments into one table (5.4). Provide a list of the detachments whose data is included in Table 5.4

5.b. Continued

**Table 5.3, Technical Staff Academic Fields for  
(Activity: NRL-DC/MRY/SSC (FTP)) (UIC: N00173)**

Academic field	Number
Physics	446
Chemistry	94
Biology	
Mathematics/Statistics/ Operations Research	45
Engineering	294
Medical	
Dental	
Computer Science	57
Social Science	6
Other Science	205
Non-Science	67
Total	1214

**Table 5.4, Technical Staff Academic Fields for all Detachments  
(Parent Activity: NRL-ORL (FTP)) (UIC: N00173)**

Academic field	Number
Physics	16
Chemistry	2
Biology	
Mathematics/Statistics/ Operations Research	1
Engineering	5
Medical	
Dental	
Computer Science	
Social Science	
Other Science	
Non-Science	1
Total	25

**c. Are there unique aspects of the activity's location that help or hinder in the hiring of qualified personnel?**

Washington, DC NRL's principal site in Washington, DC is well situated to aid in the hiring of qualified personnel. Washington provides unique access to Department of Navy and Department of Defense decision makers, and to Congressional staff. There is easy access to and from Washington by air and rail. A very high percentage of NRL's scientific and technical personnel have advanced degrees, and many are internationally recognized leaders in their fields. The recruitment and retention of professional personnel of this caliber is significantly enhanced by the location in Washington, an area replete with universities, a variety of cultural assets, a number of other R&D organizations, and active chapters of virtually all technical societies. All in all, Washington has to be rated as a highly desirable working location.

Stennis Space Center, MS The SSC is owned by NASA, and much of the work carried out there is focused on environmental R&D and the interpretation and application of remotely sensed data. Other organizations located at SSC include COMETOCEANCOM, NAVOCEANO, and environmental R&D activities from NASA, NOAA, USGS, USCG, and EPA. This "clustering" of related endeavors enhances recruiting and retention by fostering the growth of on-site university courses, technical society chapters and related activities. In addition, the expertise in remote sensing technology that is resident at SSC has proven useful to NRL programs that are developing the capability to integrate the output of satellite sensors into real-time weapon performance predictions that will be embedded in the next generation of tactical decision aids.

Monterey, CA Monterey is rapidly becoming a center of oceanographic and meteorological research, due to substantial programs at the Naval Postgraduate School, the Monterey Bay Aquarium, several nearby academic institutions, and commitment by NOAA to collocate its Western Regional Forecast Center and its new Coastal Ocean Modelling Program in a building adjacent to NRL. This clustering enhances recruitment and retention of scientific personnel, and encourages a variety of ocean-environment-related professional activities.

**BRAC #5**

**5.d. List all articles written by the in-house technical staff that were published or accepted for publication in refereed journals since 1 January 1990.**

In some cases it has been determined that conference proceedings are equivalent to Peer reviewed journals. Such papers have been indicated by an asterisk(\*).





d. Refereed Journals  
1990

"On The Dynamical Significance Of Turbulent Wall Layer Streaks." Bernard, P.S. and Handler, R.A., Applied Mechanics Review, v. 43, pp. 219-225, 1990.

"Reynolds Stress And The Physics Of Turbulent Momentum Transport." Bernard, P.S. and Handler, R.A., Journal of Fluid Mechanics, v. 220, pp. 99-124, 1990.

"Pseudo-Steady Diffusional Growth or Collapse of Bubbles Rising in Time Dependent Pressure Fields." Cerza, M., Griffin, O.M. and Stewart, M.B., ASME FED Vol. 90, pp. 217-240, ASME New York, 1990.

"Vortex Shedding and Lock-On in Bluff Body Wakes." Griffin, O.M. and Hall, M.S., International Symposium on Unsteady Flows Proceedings, ASME FED v. 92, pp. 209-218., ASME New York.1990.\*

"Coherent Structure Dynamics in Spatially Evolving Bluff-Body Wake Flows." Grinstein, F., Boris, J.P., Griffin, O., Hussain, F. and Oran, E., AIAA Paper 89-0507, AIAA 28th Aerospace Sciences Meeting, Reno, Nevada, 1990.

"On The Role Of Accelerating Particles In The Generation Of Reynolds Stress." Handler, R.A., Swearingen, J.D. and Bernard, P.S., Univ. of Missouri (Rolla), B21-1-B21-11. Proceedings of the 12th Symposium on Turbulence, 1990.\*

"Turbulent Wall-Pressure Fluctuations Over Wavy Surfaces." Handler, R.A., Experiments in Fluids, v. 10, pp. 33-40, 1990.

"A Precision Long Range Navigation and Guidance System for an AUV." Hutchison, B.L., Shirley, D.E., Oceans '90 Conference Proceedings, 1990.\*

"Direct Numerical Simulation of Turbulent Flow in an Open Channel." Leighton, R.I. and Swann, T.F., Jr., Oxford, U.K., in Lecture Notes in Physics, (K. Morton, ed.), Springer-Verlag, NY. Proceedings of the 12th International Conference on Numerical Methods in Fluid Dynamics, 1990.\*

"Fundamental Study Of Tollmien-Schlichting Waves In A Boundary Layer: Part 1-Design And Characterization Of Compliant Materials For Boundary Layer Control." Madigosky, W., Adair, D., Mease, N., Mattingly, G., Hendricks, E., Swearingen, J., Crouch, J., Gaster, M. and Carpenter, P., Toronto, Canada, June 3-6,7. Proceedings of the Spring Meeting of the ASME Fluids Engineering Division, 1990.\*

"Turbulent Mixing" In A Salt Finger Staircase." Marmorino, G.O., Journal of Geophysical Research, 95, pp. 12893-12994, 1990.

"Current shear-inertial wave interaction in the Sargasso Sea." Mied, R.P., Shen, C.Y., and Kidd, M.J., J. Phys. Oceanogr., 20, pp. 81-96, 1990.

"Hydrodynamics of Ship Wake Surfactant Films." Peltzer, R., Kaiser, J., Skop, R., Milgram, J., Griffin, O., and Barger, W, Ann Arbor, MI, Proceedings of the Eighteenth Symposium on Naval Hydrodynamics, pp. 533-552. 1990.\*

\*Believed to be Peer-Reviewed

"Hydrodynamics of remotely sensed surface ship wakes." Reed, A.M., Beck, R.F., Griffin, O.M. and Peltzer, R.D., SNAME Transactions, vol. 98, pp. 319-363.

"Statistics Of 'mixing Patches' Observed In The Sargasso Sea." Rosenblum, L.J. and Marmorino, G.O., Journal of Geophysical Research, 95, pp. 5349-5358, 1990.

"Propagating Structures In Wall-Bounded Turbulent Flow." Sirovich, L., Ball, K.S. and Handler, R.A., 1990: Proceedings of the 12th Symposium on Turbulence, Univ. of Missouri (Rolla), pp. B9-1 - B9-8, and also to appear in Recent Developments in Turbulence: the Lumley Conference (T. Gatski, S. Sarkar, C. Spezial eds.) Springer-Verlag. 1990. \*

"Modification of Directional Wave Number Spectra by Currents in the Wake of a Surface Ship." Skop, R.A., Griffin, O.M. and Leopold, Y., Journal of Ship Research, vol. 34, pp. 69-78.

"Current Measurement," Trump, C.L., Proceedings of the IEEE Fourth Working Conference Single ping ADCP data. Apr. 3-5, G.F. Appell and T.B. Curtin, eds., IEEE, New York, pp. 215-224. 1990. \*

"Direct Calculation of the Interaction Between Subsurface Vortices and Surface Contaminates" Wang, H.T. and Leighton, R.I., Proceedings of the 9th International Conference on Offshore Mechanics and Arctic Engineering, Vol. 1, Part A., pp. 271-277. 1990. \*

"Three-Dimensional Vortex Interaction With a Free Surface. Wang", H.T. and Leighton, R.I., Proceedings of the ASME Symposium on Advances and Applications in Computational Fluid Dynamics. 1990.\*

"Improved Beam Confinement in the Modified Betatron with Strong Focusing," C. A. Kapetanakos, L. K. Len, T. Smith, J. Golden, K. Smith S. J. Marsh, D. Dialetis, J. Mathew, P. Loschialpo, and J. H. Chang, Phys. Rev. Lett. 64, p. 2374, 1990.

"Progress in the Development of the NRL Modified Betatron Accelerator," L. K. Len, T. Smith, J. Golden, K. Smith, S. J. Marsh, D. Dialetis, J. Mathew, P. Loschialpo, J. H. Chang, and C. A. Kapetanakos, SPIE 1226, p. 382, 1990.

"Complex Resonances of Conducting Spheres with Lossy Coatings," D. J. Taylor, A. K. Jordan, P. J. Moser, H. Uberall, IEEE Transactions on Antennas and Propagation, Vol. 38, No. 2, p. 236, 1990.

"Scaling of 85 GHz Gyrotron to Operate at 94 GHz," G. Bergeron, M. Czarnaski, and M. Rhinewine, Int. J. Electronics, Vol. 69, No. 2, pp. 281-290, 1990.

"False Alarm Control Using Doppler Estimation." G. V. Trunk, W. Gordon, and B. H. Cantrell, IEEE Trans. on AES, Vol. 26, No. 1, pp. 146-153, January 1990.

"Looking Over The Horizon." J. M. Headrick, IEEE Spectrum, July 1990.

"Exact and Steady-State Solutions to Sinusoidally Excited Half-Infinite Chains of Harmonic Oscillators with One Isotopic Defect." E. L. Mokole, A. L. Mulliken, and M. B. Sledd, Journal of Mathematical Physics, Vol. 31, No. 8, pp. 1902-1913, August 1990.

"Convergence Properties of the Gram-Schmidt and SMI Adaptive Algorithms." Karl Gerlach and Frank Kretschmer, Jr., IEEE Trans. on AES, Vol. 26, No. 1, pp. 44-56, January 1990.

"Implementation and Convergence Considerations of a Linearly Constrained Adaptive Array." Karl Gerlach, IEEE Trans. on AES, Vol. 26, No. 2, pp. 263-272, March 1990.

"Adaptive Array Transient Sidelobe Levels and Remedies." Karl Gerlach, IEEE Trans. on AES, Vol. 26, No. 3, pp. 560-568, May 1990.

"The Efforts of IF Band Pass Mismatch Errors on Adaptive Cancellation." Karl Gerlach, IEEE Trans. on AES, Vol. 26, No. 5, pp. 455-468, September 1990.

"Equivalent Transformation of a Partially Adaptive Array." Karl Gerlach, IEEE Trans. on AES, Vol. 26, No. 6, pp. 1031-1034, November 1990.

"Cascaded Detector for Multiple High PRF Pulse Doppler Radars." Karl Gerlach and G. A. Andrews, Jr., IEEE Trans. on AES, Vol. 26, No. 5, pp. 754-767, September 1990.

"Computing Grazing Angle of Specular Reflection." A. Miller and E. Vegh, INT J. Math, Education, Science and Technology, Vol. 21, No. 2, pp. 271, 274, 1990.

"Learning sequential decision rules using simulation models and competition." John J. Grefenstette, Connie L. Ramsey and Alan C. Schultz, Machine Learning v5, n4, 355-381, Kluwer Academic Publishers, October 1990.

"Testing and Evaluation of Expert System Prototype: A Case Study." Laura Davis and Jay Liebowitz, Information Age, v12, n2, pp. 75-82, Butterworth Publishers, April 1990.

"Evaluation of L2 Systems Learners and Theory." Henry Hamburger, CALL, v1, pp. 19-27, Intellect Publishing Co., 1990.

"Semantically Constrained Exploration and Heuristic Guidance." Henry Hamburger and Akhtar Lodgher, Machine-Mediated Learning, v3, pp. 81-105, Taylor and Mentor Systems, Inc., 1990.

"Expert Systems at the Navy Center for Applied Research in Artificial Intelligence." Randall Shumaker and Laura Davis, Expert Systems With Applications, v1, pp. 71-77, Pergamon Press, 1990.

"Calibration of a Stereo System with Small Relative Angles." Behrooz Kamgar-Parsi and Roger D. Eastman, Computer Vision, Graphics, and Image Processing, v51, pp. 1-19, Academic Press, Inc., 1990.

"Clustering with Neural Networks." Behzad Kamgar-Parsi, J.A. Gualtieri, J.E. Devaney, and Behrooz Kamgar-Parsi, Biology Cybernetics, v 63, pp. 201-208, Springer-Verlag, 1990.

"On Problem Solving with Hopfield Neural Networks." Behzad Kamgar-Parsi and Behrooz Kamgar-Parsi, Biological Cybernetics, v62, pp. 415-423, Springer-Verlag, 1990.

Effect of Worst-Case Multiple Partial-Band Noise and Tone Jammers on Coded FH/SSMA Systems." E. Geraniotis, IEEE Journal on Selected Areas in Communications, 8, pp. 613-627, May 1990.

"Multiple-Access Capability of Frequency-Hopped Spread-Spectrum Revisited: An Analysis of the Effect of Unequal Power Levels." E. Geraniotis, IEEE Transactions on Communications, 38-7, pp. 1066-1077, July 1990.

"Packet-Error Probability Analysis for Unslotted FH-CDMA Systems with Error Control Coding." J. A. B. Tarr, J. E. Wieselthier, and A. Ephremides, IEEE Transactions on Communications, 38, pp. 1987-1993, November 1990.

"The Specification and Verified Decomposition of System Requirements Using CSP." A. Moore, IEEE Transactions on Software Engineering, 16:9, 1990.

"Using CSP to Develop Trustworthy Hardware." A. Moore, EEE Proc. 5th Conf. on Computer Assurance, 1990.

"A Software Engineering Methodology for Rule-Based Systems." R.J.K. Jacob and J.N. Froscher, EEE Transactions on Knowledge and Data Engineering. Vol.2, No.2, pp. 173-189, June 1990.

"Software Development for Hard Real-Time Systems." C.L. Heitmeyer and B. Labaw, Proceedings, Seventh IEEE Workshop on Real-Time Operating Systems and Software, IEEE CS Press, Los Alamitos, CA, 1990.\*

"Experiment to Evaluate Interface Styles for an Intelligent Cockpit with Adaptive Aiding." C.L. Heitmeyer, Proceedings, CHI '90 Workshop on Computer-Human Interaction in Aerospace Systems, Seattle, WA, 1-2 April 1990.\*

"Experiment to Evaluate Interface Styles for an Intelligent Cockpit with Adaptive Aiding." C.L. Heitmeyer, Proceedings, CHI '90 Workshop on Computer-Human Interaction in Aerospace Systems, Seattle, WA, 1-2 April 1990.\*

"Probabilistic Inference." James Gray, Proceedings of the IEEE Symposium on Research in Security and Privacy, May 1990.\*

"Information Sharing in Secure Systems." James Gray, Proceedings of the Computer Security Foundations Workshop III, June 1990.\*

"An Analysis of Ordnance Software Using the MALPAS Tools." Ken Hayman, Proceedings of COMPASS '90, June 1990.\*

"The Specification and Modeling of Computer Security." John McLean, Computer, January 1990.

"Security Models and Information Flow." John McLean, Proceedings of the IEEE Symposium on Research in Security and Privacy, May 1990.\*

"Extending the Brewer-Nash Model to a Multilevel Context." Catherine Meadows, Proceedings of the IEEE Symposium on Research in Security and Privacy, May 1990.\*

"Representing Partial Knowledge in an Algebraic Security Model." Catherine Meadows, Proceedings of the Computer Security Foundations Workshop III, June 1990.\*

"Issues in Trusted Object-Oriented Database Security." Catherine Meadows, Proceedings of the National Computer Security Conference, October, 1990.\*

"Quotient States and Probabilistic Channels." Ira Moskowitz, Proceedings of the Computer Security Foundations Workshop III, June 1990.\*

"Formal Semantics for Logics of Cryptographic Protocols." Paul Syverson, Proceedings of the Computer Security Foundations Workshop III, June 1990.\*

"Channel Probe Observations Of The Auroral Ionosphere During High-Power Auroral Simulation Heating Experiments." L. S. Wagner & J. A. Goldstein (Non Nrl Authors: R.W. Lind, A.Y. Wong, And M.J.Mccarrick), Published In Radio Science, Volume 25, Number 6, pp. 1407-1422, November-December 1990.

"Clustering Taxonomic Data With Neural Networks." Behzad Kamgar-Parsi and J.A. Gualtieri, Proc. International Joint Conference on Neural Networks, Washington, D.C., vol. 1, pp. 277-280, January 1990.

"Statistics Of Mixing Patches Observed In The Sargasso Sea." Rosenblum, L.J. and G.O. Marmorino, J. Geophysical Research, Vol. 95, No. C4, pp. 5349-5358, April 1990.

"Solving Inversion Problems In Remote Sensing With Neural Networks." Behzad Kamgar-Parsi and J.A. Gualtieri, Proc. International Joint Conference on Neural Networks, San Diego, CA, vol. 3, pp. 955-960, June 1990.\*

"The Navy's New Standard Signal Processor, the AN/UYS-2." Mr. Greg Melcher, Mr. Greg Thomas, and Mr. David J. Kaplan, Journal of VLSI Signal Processing, pp. 103 - 110, Vol. 2, No. 2, October 1990.

"On Problem Solving With Hopfield Neural Networks." Behzad Kamgar-Parsi and Behrooz Kamgar-Parsi, Biological Cybernetics, vol. 62, pp. 415-423, 1990.

"Clustering With Neural Networks." Behzad Kamgar-Parsi, J.A. Gualtieri, J.E. Devaney, and Behrooz Kamgar-Parsi, Biological Cybernetics, vol. 63, pp. 201-208, 1990.

"Simultaneous Fitting Of Several Planes To Point Sets Using Neural Networks." Behrooz Kamgar-Parsi, Behzad Kamgar-Parsi, and H. Wechsler, Computer Vision, Graphics, and Image Processing, vol. 52, pp. 341-359, 1990.

"Time-frequency Analysis of Acoustic Scattering from Elastic Objects." Nai-chyuan Yen, L. R. Dragonette, S. K. Numrich, Journal of the Acoustical Society of America, 87 (6), pp. 2359 - 70, 1990.

"Hardware Image Motion Compensation for a Scanning, Space-Borne Sensor." R. L. Lucke, published in Infrared Physics, Vol. 30, p. 121, 1990.

"Wavelength Dependence of Scattering Loss in Fluoride Optical Fibers." L. Busse, G. McCabe, and I. Aggarwal, " published in Optics Letters 15 (8), pp. 423 - 424, 1990.

"New Fluorination Reactions of Ammonium Bifluoride." J. Sanghera, P. Hart, M. Sachon, K. Ewing, and I. Aggarwal, published in the Journal of American Ceramic Society 73, pp. 1339-1346, 1990.

"Growth and Decay Kinetics of Defect Centers in High-Purity Fused Silicas Irradiated at 77K with X Rays or 6.4-eV Laser Light." D. Griscom, published in Nucl. Ins. Meth, B46, pp. 12-17, 1990.

"Si E' Centers and UV-Induced Compaction in High Purity Silica." T. Tsai , D. Griscom, and E. Friebele, published in Nucl. Ins. Meth., B46, pp. 265-268, 1990.

"Interlaboratory Comparison of Radiation-Induced Attenuation in Optical Fibers Part III. Transient Exposures." E. Friebele, P. Lyons, R. Gilbert, H. Henschel, A. Johan, J. Krinsky, W.

Schneider, D. Smith, A. Robinson E. Taylor, G. Turquet de Beaugard, R. West, and P. Zagarino, published in Journal of Lightwave Technology, 8, pp. 977-989, 1990.

"Interlaboratory Comparison of Radiation-Induced Attenuation In Optical Fibers. Part II: Steady State Exposure." E. Taylor, E. Friebele, H. Henschel, R. West, J. Krinsky, and C. Barnes, published in Journal of Lightwave Technology, 8, pp. 967-976, 1990.

"Calculation of Scattering Loss as a Function of Cooling Rate for a Fluorozirconate Glass." G. Lu, P. Hart, and I. Aggarwal, published in Physics and Chemistry of Glasses, Vol. 31 (5), pp. 205-208, 1990.

"Defect Centers Induced by the Harmonic Wavelength of 1.06  $\mu\text{m}$  Light in Ge-P-Doped Silica." T. Tsai, E. Friebele, D. Griscom, and M. Saifi, published in Electro-Optics and Nonlinear Optic Material, Ceramic Transactions Vol. 14 (A.S. Bhalla, E.M. Vogel and K.M. Nair, Eds.) American Ceramic Society, Westerville, OH, pp. 127-136, 1990.

"Electron Spin Resonance Investigations of Defects and Defect Processes in Amorphous Silicon Dioxide." D. Griscom, published in the Review of Solid State Science, Vol 4, pp. 565-599, 1990.

"Photoluminescence Induced by 6.4 eV Photons in High Purity Silica", published in "Optical Fiber Materials and Processing," T. Tsai, H. Lin, Materials Research Society, Vol. 172, pp. 125-131, 1990.

"Investigation of Differential Induced Attenuation of Orthogonal Axes in Polarization Maintaining Fibers", published in "Optical Fiber Materials and Processing, M. Gingerich, S. Hickey, C. Harrington, E. Friebele, L. Looney, and J. Onstott, Materials Research Society, Vol. 172, pp. 111-117, 1990.

"Materials Effects on the Radiation Sensitivity of Single Mode Optical Fibers," E. Friebele, C. Askins, M. Gingerich, C. Shaw, and W. Schmidt, published in "Optical Fiber Materials and Processing," Materials Research Society, Vol. 172, pp. 103-109, 1990.

"The Fate of Selected Impurities in the Recrystallization of Zirconium Oxychloride and in its Conversion to Zirconium Tetrafluoride." J. Sommers, J. Fahey, K. Ewing, and I. Aggarwal, published in the Journal of Materials Research, Vol. 5, No. 2, pp. 392-396, 1990.

"Quantitative Analysis of Nickel and Copper in Zirconium Fluoride Using Graphite Furnace Atomic Absorption Spectrometry." K. Ewing, J. Jaganathan, E. O'Brien, and I. Aggarwal, published in Microchemical Journal 41, pp. 106-112, 1990.

"Glass Formation and Thermal Properties of Low-Silica Calcium Aluminosilicate Glasses." P. Higby, R. Ginther, I. Aggarwal, and E. Friebele, published in the Journal of Non-Crystalline Solids, Vol. 126, pp. 209-215, 1990.

"The Effect of  $\text{AlF}_3$  on the Physical Properties and Stability of Fluoro-Zirconate and Fluorozirconate Glasses," J. Sanghera, P. Hart, M. Sachon, L. Busse, and I. Aggarwal, published in the Journal of American Ceramic Society, Vol. 73, pp. 2677-2683, 1990.

"Approaches to Accurate Characterization of High Purity Metal Fluoride and Fluoride Glasses," E. Beary, P. Paulsen, T. Rains, K. Ewing, and I. Aggarwal, published in the Journal of Crystalline Growth, Vol. 106, 51-60, 1990.

"Origin and Elimination of Scattering Centers in Fluoride Glasses and Fibers." J. Sanghera, I. Aggarwal, B. Harbison, L. Busse, and P. Pureza, published in "Optical Fiber Materials and Processing", Materials Research Society, Vol. 172, pp. 157-162, 1990.

"Design Parameters for Fluoride Multimode Fibers: Effects of Coating and Bending on Loss." L. Busse and I. Aggarwal, published in "Optical Fiber and Processing", Materials Research Society, Vol. 172, pp. 177-182, 1990.

"Optical Studies of Quantum Confined  $\text{CuCl}$  and  $\text{CuCl}_x\text{Br}_{1-x}$  Glass Composites." J. Ruller, R. Ginther, G. Williams, B. Justus, A. Campillo, and E. Friebele, published in Electro-Optics and Nonlinear Optic Material, Ceramic Transactions Vol. 14, (A.S. Bhalla, E.M. Vogel and K.M. Nair, Eds.), American Ceramic Society, Westerville, OH, pp. 151-158, 1990.

"Tetrahalodimolybdate(II) Complexes with Alkyl Substituted Pyridines. A Structural and Spectroscopic Study." K. Ewing and S. Shupack, A. Rheingold, published in Polyhedron, Vol. 9, pp. 1209-1215, 1990.

"Radiation Effects in Polarization-Maintaining Fibers," published in Fiber Optics '90, SPIE Vol. 1314, pp. 146-154, 1990.

"Standardized Measurements for Determining the Radiation-Induced Attenuation in Optical Fibers," published in the proceedings of the Symposium on Optical Fiber Measurements NIST Special Pub. 792, Boulder, CO, pp. 159-162, 1990.\*

"Control of Parameters Affecting Optical Path Distortion in Heavy Metal Fluoride Glass Windows," published in Properties and Characteristics of Optical Glass II, SPIE Vol. 1327, pp. 190-197, 1990.

"Effect of Small Silica Additions on the Properties and Structure of Calcium Aluminate Glasses," P. Higby, C. Merzbacher, I. Aggarwal, and E. Friebele, published in Properties and Characteristics of Optical Glass II, SPIE Vol. 1327, (A.J. Marker, Ed.), pp. 198-202, 1990.

"Characterization of Quantum-Confined  $\text{CuCl}$  Microcrystals in a Glassy Matrix." J. Ruller, D. Dutt, G. Williams, E. Friebele, B. Justus and A. Campillo, published in, Properties and Characterization of Optical Glass, SPIE Vol. 1327 (A.J. Marker, Ed.), pp. 145-150, 1990.

"Spatial Light Modulators: Functional Capabilities, Applications and Devices." A. D. Fisher, published in International Journal of Optoelectronics, Vol. 5, No. 2, pp. 125-167 (Invited Paper), 1990.

"Derivation and Analysis of a Least Mean Square Filter" I.B. Schwartz, published in Mathematical and Computer Modeling, vol. 13, pp. 37-44, 1990.

"Polymer Membrane Properties And Structures For Membrane Light Modulator Applications" P.B. Rolsma, J. Lee, published in Opt. Lett., vol. 15, June 15, 1990.

"Advanced Channelization Devices for RF, Microwave, and Millimeterwave Applications" G.W. Anderson, D. Webb, A.E. Spezio, and J.N. Lee, for publication in Proc. IEEE, August, 1990.

"Microwave and Magneto-optic Properties of Bismuth Substituted Yttrium Iron Garnet Thin Films" J.C. Butler, J.J. Kramer, R.D. Esman, A.E. Craig, J.N. Lee, and T. Ryuo, for publication in Journal of Applied Physics, May 1, vol. 67, pp. 4938-4940, 1990.



"Optical Matched Filter with Log-CFAR Detection" R.L. Denningham, R.D. Griffin, and J.N. Lee, for publication in Appl. Opt., 1990.

"Automated Neyman-Pearson Classifier Design Using Projection Pursuit." T. E. Flick, L.K. Jones, R.G. Priest, C. Herman, for publication by Pattern Recognition, 1990.

"Growth of Single Crystal Diamond by Combustion Synthesis" R. Komanduri and K. Snail, for publication by Phil. Mag. Letters, July 1990.

"Pumping Reactions in a Photoinitiated XeF<sub>2</sub>-D<sub>2</sub> Chemical Laser" S. Searles and M. Winings, , published in Journal of Chemical Physics, 93, (7), pp. 4713-4718, Oct. 1990.

"Characteristics of the High Pressure Ar/Xe Laser Pumped by an Electron Beam and an Electron-Beam Sustained Discharge" A. Suda, B. Wexler, K. Riley, B. Feldman, published in the Journal of Quantum Electronics, QE-26, pp.911-921, May 1990.

"Identification of Morphology Dependent Resonances in Stimulated Raman Scatteing from Microdroplets," H.B. Lin, J. Eversole, and A. Campillo, published in Optics Comm., 77, pp. 407-410, July 1990.

"Effects of Helium Addition to Ar/Xe Mixtures in High-Pressure Atomic transition of Xenon Lasers" B. Wexler, A. Suda, K. Riley and B. Feldman, published in IEEE J. Quantum Electronics, vol 26, pp. 1302-1308, July 1990.

"Three Micron laser Performance of Ho:YALO<sub>3</sub> and Nd. Ho:YALO<sub>3</sub>," S. Bowman, W. Rabinovich, A.P. Bowman, and B. Feldman, published in IEEE Journal of Quantum electronics, vol. QE 26, No. 3, pp. 403-406, Mar 1990.

"Phase Pulling in Transient Raman Amplifiers" M. Duncan, R. Mahon, L. Tankersley, G. Hilfer, and J. Reintjes, published in JOSA-B, 7 , p. 202, 1990.

"Solid State Coherent Laser Radar Measurements of High Velocity Targets" A. Huston and M.G. Roe, , published in Optics Letters, 15, pp. 570-572, May 15, 1990.

"Vibrating Orifice Droplet Generator for Precision Optical Studies." H.B. Lin, J. D. Eversole, and A. Campillo, published in Review of Scientific Instruments, 61, pp. 1018-1023, March 1990.

"Nonlinear MIE Scattering: Electrostrictive Coupling of Light to Droplet Acoustic Modes" A. Huston, H-B Lin, J. Eversole A. Campillo, for publication in Optics Letters, Oct. 15, 1990.

"Noncontact Fluorescence Thermometry of Acoustically Levitated Water Drops." M. Seaver and J. Peele, published in Applied Optics, Vol 29, No. 33, pp. 4956-4961, Nov. 1990.

"Ultraviolet Optical Isolator Utilizing KDP-Isomorphs." J. Dexter, J. Landry, D. Cooper, J. Reintjes, published in Optics Communications, Vol. 8, number 2, pp. 115-118, 1990.

"Photochemical Bleaching of Phodamine 6G as a Proble of Binding Geometries on a Fused Silica Surface" A. Huston and C. Reimann, Chemical Physics, pp. 6546-6006, June 1990.

"Frequency Pulling of Stimulated Raman Scatterng in Microdroplets" H-B. Lin, J. Eversole and A. Campillo, published in Optics Letters, 15, pp. 387-389, April 1990.

"Achromatic Multibeam Coupling in KNbO<sub>3</sub>:Rb." W. Rabinovich, G.C. Gilbreath and B. Feldman, submitted to Optics Communications, pp. 6540-6061, August 1990.

"High Efficiency, High Energy Performance of An X-ray Preionized Ar/Xe Laser" J. Tucker and B. Wexler, published in IEEE Journal of Quantum Electronics, 26, p. 1647, 1990.

"Stimulated Brillouin Scattering And Phase Conjugation Of Multiline Hydrogen Fluoride Laser Radiation" W. Whitney, M. Duignan, and B. Feldman, published in JOSA B, Vol. 7 No.11, pp. 2160-2168, Nov. 1990.

"Control Of Transverse Spatial Modes In Transient Stimulated Raman Amplification." M. Duncan, R. Mahon. L. Tankersley and J. Reintjes, published in JOSA B 7, p. 1336, 1990.

"Chromatic Time Lag In Picosecond Streak Camera Measurements" M. Duncan and R. Mahon, published in Applied Optics 29, p. 2369, 1990.

"Second Stokes Generation in Deuterium and Hydrogen", M. Duncan R. Mahon, L. Tankersley and J. Reintjes, submitted for publication to Optics Communications, pp. 6540-6069, 1990.

"VUV Stimulated Anti-Stokes Raman Emission in Inverted Selenium", D. Cooper, R.C.Y. Auyeung and B. Feldman, published in IEEE, J. Quantum electronics, 26, p. 1546, Sept. 1990.

"Stimulated Emission In Atomic Hydrogen At 656 Nm", R.C.Y. Auyeung, D. Cooper, S. Kim and B. Feldman, published in Opt. Communications, 79, p. 207, Oct. 1990.

J. Reintjes, M. Duncan, R. Mahon, L. Tankersley, to be presented to the OSA 1990 Annual Meeting, Nov. 4-8, 1990, Boston, MA (submitted June 1990, 6540-6057).

"Introduction to the Special Issue on electronic Transition Gas Lasers", B. Feldman and J. Gary Eden, published in IEEE J.Quantum Electronics, 26, Sept. 1990

"Correlation effects in pump-depleted broadband Raman Amplification", M. Bashkansky, G. Hilfer, J. Dexter, and J. Reintjes, published in the technical digest, p154,WU6, of the OSA Annual Meeting, Boston, MA Nov. 4-9, 1990

"Statistical study of beam replication in stimulated raman scattering" G. Hilfer, C. Menyuk, J. Reintjes, published in technical digest p. 153, WU1, of the OSA 1990 Annual meeting in Boston, MA, Nov. 4-8, 1990.\*

"Basic parameters for Chromium Thulium Holmium YAG 2.1 micron lasers",S. Bowman, M. Winings, S. Searles, and B. Feldman, OSA Annual Meeting Technical Digest 1990, Vol. 15 of the OSA Technical Digest Series (Op. Soc. Am, Washington, DC 1990) pp. 175-176, Paper ThL5.\*

"Effect of mode spacing on growth from noise in broadband stimulated Raman Scattering", G. Hilfer, J. Reintjes, C. Menyuk, to be presented to the OSA 1990 Annual Meeting, Nov. 4-8, 1990, in Boston, MA (submitted June 1990 6540-6056) to be included in conference proceedings.\*

"Noise characteritics in a low light level Raman amplifier", J. Reintjes, M. Duncan, R. Mahon, L. Tankersley, to be presented to the OSA 1990 Annual Meeting, Nov. 4-8, 1990, Boston, MA (submitted June 1990, 6540-6057) to be included in conference proceedings.\*

"Characterization of Quantum-Confined CuCl Microcrystals in a Glassy Matrix", J. Ruller, D. Dutt, G. Williams, B. Justus, A. Campillo, and J. Friebele, published in proceedings of the 1990 SPIE Conference in Properties and Characteristics of Optical Glass, Vol. 1327, 1990.\*

"High Efficiency Operation of the Ar.Xe Laser Using a Spiker-Sustainer Discharge Circuit", J. Tucker and B. Wexler, CLEO '90 Technical Digest Volume 7, May 21-25, 1990, Anaheim, CA

"Imaging Through a Low Light Level Raman Amplifier" M. Duncan, R Mahon. L. Tankersley, and J. Reintjes, for publication in conference proceedings at SPIE Symposium on Nonlinear Optics (OE/LASE '91), Los Angeles, CA January 20-25, 1991 (submitted June 1990).\*

"Tuning the 3  $\mu\text{m}$  Ho:YALO<sub>3</sub> Laser", S. Bowman, W. Rabinovich, B. Feldman, M. Winings, published in Digest of Topical Meeting on Advanced Solid State Lasers 1990 (Op. Soc. Am, Washington, DC 1990) pp. 149-151, paper WB2.\*

"Chemical Stability in Pulsed Chemical Laser Mixtures", S. Searles, and M. Winings, Conference on Lasers and Electro-Optics, 1990 published in Technical Digest Series, Vol. 7 (Op Soc. Am., Washington, DC 1990) pp. 84-86, paper CTUE5

"Laser and Spectral Properties of Cr, Tm, Ho:YAG at 2.1 $\mu\text{m}$ ", S. Bowman, M. Winings, R. Auyeung, S. Searles, B. Feldman, conference proceedings for OSA, Nov. 8, 1990, Boston, MA 1999.\*

"IR Laser Induced Photoorientation of Li (H<sub>2</sub>O) in Solid Argon", Z. Kafafi, R. Pong and J. Shirk, J. Molecular Structure, 222, 245 (1990).

"Efficient Room Temperature Operation of a Flashlamp-pumped, Cr:Tm:YAG Laser at 2.01 $\mu\text{m}$ ", G. Quarles, A. Rosenbaum, C. Marquardt, and L. Esterowitz, Optics Letters, 15, 42 (Jan 90).

"Diode pumped single mode fluorozirconate fiber laser from the  $4I_{11/2} - 4I_{13/2}$  transition in erbium", R. Allen and L. Esterowitz, Appl. Phys. Letts., Vol. 56, No. 17 (Apr 90).

"Efficient Room Temperature Operation of Cr<sup>3+</sup>-Sensitized, Flashlamp-pumped, 2 $\mu\text{m}$  Lasers", G. Quarles, C. Marquardt, L. Esterowitz, A. Rosenbaum, and I. Abella (Univ. of Chicago), Optical and Quantum Electronics Journal, Special Issue on "Solid State Lasers", Chapman and Hall Ltd 22, 5141 (1990).

"Transport Investigation of HgTe-CdTe Single and Multiple Quantum Wells", C. Hoffman, J. Meyer, F. Bartoli, et al, Surface Science 228, 45 (1990).

"Nonlinear optical properties of Benzimidazobenzophenanthroline Type Ladder Polymers"J. R.Lindle, F. J. Bartoli, C. A. Hoffman, O.-K. Kim, Y. S. Lee, J. S. Shirk and Z. H. Kafafi, submitted to Appl. Phys. Letts., 56, 712, 1990.

"Band Edge Properties of Quasi-1D HgTe-CdTe Heterostructures", J. Meyer, F. Bartoli, C. Hoffman and L. R. Ram-Mohan, Physical Review Letters, 64, 1963 (1990).

"Efficient, broadly tunable laser-pumped Tm:YAG and Tm:YSGG cw Lasers", R. Stoneman and L. Esterowitz, Optics Letters 15, 486 (1990).

"Far Infrared Magneto-optical Study of Holes and Electrons in Zero-Gap HgTe/Cd<sub>0.85</sub>Hg<sub>0.15</sub>Te Superlattices", M. Dobrowolska, T. Wojtowicz, J. K. Fundyna, O. K. Wu, J.N. Schulman, J. R. Meyer, C. A. Hoffman, F. J. Bartoli, et al., Phys. Rev. B. 41, p. 5084 (1990).

"Narrow-Gap II-VI Superlattices: Correlation of Theory with Experiment", J. R. Meyer, Semicond. Sci. Technol., 5, 90 (1990), also presented at International Conference on Narrow-Gap Semiconductors and Related Materials, Gaithersburg, MD 12-15 June 89 (Invited).

"Novel FIR Nonlinear Optical Materials", E. R. Youngdale, C. A. Hoffman, J. R. Meyer, F. J. Bartoli, X. Chu, J. P. Faurie, J. W. Han, J. W. Cook, Jr., J. F. Schetzina, N. A. Engelhardt, E. W. Niles and H. Hochst, Semicond. Sci. Tech., 5, 253, (1990) (also presented at Int. Conf. on Narrowgap Semiconductors and Related Materials, Gaithersburg, MD (12-15 June 89).

"Electron Transport and Cyclotron Resonance in [211]-Oriented HgTe-CdTe Superlattices", C. Hoffman, J. Meyer, R. Wagner and F. Bartoli et al, J. Vac. Sci. Technol. A 8 1200 (1990).

Appl. Phys.Lett., E. Youngdale, J. Meyer, C. Hoffman and F. Bartoli, for publication 57, 336 (1990).

"Nonlinear Optical Coefficients of Narrow-gap Semiconductors", E. Youngdale, C. Hoffman, J. Meyer, F. Bartoli, et al, J. Vac. Sci. Technol. A8, 1215 (1990).

"Fast, Efficient Median Filters with Even Length Windows", J. Havlicek, K. Sarkady, G. Katz and J. McKeeman (Va Tech), for publication in Electronics Letters, IEE, Michael Faraday House, UK.

"Alexandrite Laser Excitation of a Tm:Ho:Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub> Laser", G. Quarles, L. Esterowitz et al., for publication in Journal of the Optical Society of America, B (JOSA B), OSA.

"Diode Pumped Room-Temperature CW 1.45 $\mu$ m Tm:Tb:YLF Laser", G. Rosenblatt, R. Stoneman and L. Esterowitz, OSA Proceedings on Advanced Solid State Lasers, Vol. 6, 1990.\*

"3 $\mu$ m Laser Performance of Ho:YAlO<sub>3</sub> and Nd:Ho:YAlO<sub>3</sub>", S. Bowman, W. Rabinovich, A. Bowman, B. Feldman and G. Rosenblatt, IEEE Journal of Quantum Electronics, Vol. 26, 3 Mar 1990.

"Reactions of Small Carbon Clusters with Water in Cryogenic Matrices. The FTIR Spectrum of Hydroxyethynylcarbene", B. Ortman, R. Hauge, J. Margrave and Z. Kagagi, J. Phys. Chem. (accepted 4/18/90)

"Trivalent Thulium Laser at 1.95 $\mu$ m for Enhanced Laser-Tissue Interactions", L. Esterowitz and R. Stoneman, presented to OE/LASE 90, Los Angeles, CA (Jan 90) also published in "Laser Tissue Interactions", SPIE Proceedings, Vol. 1202, 1990.\*

"Tunable CW Solid State Laser Action in the 2 $\mu$ m Region", R. Stoneman and L. Esterowitz, presented to OE/LASE 90, Los Angeles, CA (Jan 90) also published in "Solid State Lasers", SPIE Proceedings, Vol. 1223, 1990.\*

"Flashpumped Room Temperature 2 $\mu$ m Laser with 5% Slope Efficiency", G. Quarles, A. Rosenbaum, C. Marquardt and L. Esterowitz, " presented to OE/LASE 90, Los Angeles, CA (Jan 90) also published in "Solid State Lasers", SPIE Proceedings, Vol. 1223, p. 221, 1990.\*

"Efficient Room Temperature Operation of a Flashlamp-pumped, Cr:Tm:YAG Laser at 2.014 $\mu$ m", G. Quarles, C. Marquardt, and L. Esterowitz, presented to Advanced Solid State Lasers conference, Salt Lake City, Utah (Mar 90) (INVITED TALK), also published in Vol. 6 of the Optical Society Proceedings Series (1990).\*

"Tunable, Flashpumped Operation of a Cr:Tm:YAG Laser between 1.945-1.965 $\mu$ m", J. Pinto and L. Esterowitz, presented to Advanced Solid State Lasers Conference, Salt Lake City, Utah (Mar 90), also published in Vol. 6 of the Optical Society Proceedings Series (1990).\*

"Nonlinear Optical Studies on Transition Metal Complexes of -Aminobenzenethiol", Z. Kafafi, J. Lindle, F. Bartoli, J. Shirk, T. Yoon and O-K Kim, presented to American Chemical Society meeting, Boston, MA (Apr 90) also published in Proceedings of the ACS Symposium on New Materials for Nonlinear Optics, ACS.\*

"Excited State Absorption Effects in Tm<sup>3+</sup> - activated 2 $\mu$ m Laser Crystals", G. Rosenblatt (SFA Inc.), G. Quarles, C. Marquardt and L. Esterowitz, for presentation to IEEE Lasers and Electro-Optics Society meeting, Boston, MA (Nov 90) and publication in Proceedings.\*

"A Novel Coupling Technique for End Pumping Solid-State Lasers using One-Centimeter, Linear-Aperture High-Power Laser Diode Bars", James G. Lynn (SFA Inc.), R. Stoneman and L. Esterowitz, for presentation to IEEE Lasers and Electro-Optics Society meeting, Boston, MA (Nov 90) and publication in Proceedings.\*

"2 $\mu$ m-Pumped AgGaSe<sub>2</sub> Optical Parametric Oscillator with Continuous Tuning between 2.49 and 12.05 $\mu$ m", G. Quarles, C. Marquardt, L. Esterowitz, for presentation to IEEE Lasers and Electro-Optics Society meeting, Boston, MA (Nov 90) and publication in Proceedings.\*

"Novel Diode Pumping Schemes for NIR Rare Earth Lasers", L. Esterowitz, R. Stoneman and G. Rosenblatt, for presentation to IEEE Lasers and Electro-Optics Society meeting, Boston, MA (Nov 90) and publication in Proceedings.\*

"Resonant Pumping Schemes for the Er<sup>3+</sup> 3  $\mu$ m Laser", R. Stoneman, J. Lynn and L. Esterowitz, for presentation to IEEE Lasers and Electro-Optics Society meeting, Boston, MA (Nov 90) and publication in Proceedings.\*

"Trivalent Thulium Laser at 1.95 $\mu$ m for Enhanced Laser-Tissue Interactions", L. Esterowitz and R. Stoneman, presented to OE/LASE 90, Los Angeles, CA (Jan 90), also published in "Laser Tissue Interactions", SPIE Proceedings, Vol. 1202, 1990.\*

"Tunable CW Solid State Laser Action in the 2 $\mu$ m Region", R. Stoneman and L. Esterowitz, presented to OE/LASE 90, Los Angeles, CA (Jan 90), also published in "Solid State Lasers", SPIE Proceedings, Vol. 1223, 1990.\*

"Flashpumped Room Temperature 2 $\mu$ m Laser with 5% Slope Efficiency", G. Quarles, A. Rosenbaum, C. Marquardt and L. Esterowitz, presented to OE/LASE 90, Los Angeles, CA (Jan 90), also published in "Solid State Lasers", SPIE Proceedings, Vol. 1223, p. 221, 1990.\*

"Nonuniformity Correction for Staring IR Focal Plane Arrays using Scene-Based Techniques", D. Scribner, K. Sarkady, J. Caulfield, M. Kruer, G. Katz, C. Gridley and Charles Herman (MRJ Inc.), presented to SPIE 1990 Technical Symposium on Optical Engineering and Photonics in Aerospace Sensing, Orlando, FL (Apr 90) and also published in SPIE Vol. 1308 *Infrared Detectors and Focal Plane Arrays*.

"Susceptibility of InSb CID Focal Plane Arrays to Frequency Doubled CO<sub>2</sub> Laser Irradiation (U)", C. Hoffman, F. Bartoli, J. Lindle and E. Youngdale, presented to IRIS Specialty Group on Infrared Counter-measures, APL, JHU, Laurel, MD (May 90) and also for publication in Proceedings.\*

"Measurements and Metrics for IFPA Stability and Nonuniformity Correction", D. Scribner, C. Gridley, K. Sarkady, M. Kruer and J. Hunt, presented to 1990 Meeting of the IRIS Specialty Group on Infrared Detectors, NIS&T, Gaithersburg, MD (Aug 90) and also for publication in Proceedings.\*

"Dandridge Applications of fiber optic sensors", Ser 6570-8048-1990 Circuits & Devices Mag.PUBL Feb \_90 AD- 9/18/90

"Linear 0-20 GHz modulation with a 1.2 directional coupler", Bulmer,Burns PUBL. Jan.\_91 Photonics Tech. Letters AD 9/21/90, Pickett Ser 6570-8049

"Microwave Subcarrier & clock ", Esman,Williams,White(Lehigh) PUBL. Feb. \_91JFW 9/26/90 & Uzunoglu(Synchtrack) recovery by an optically inj. CPSO\_Ser 6570-8050 Photonics Tech. Ltrs.

"Effect of phase noise in linear mod. sensor", Bulmer,Moeller, \_DARPA/RADC Symp.Antenna JFW 10/4/90 Burns systems\_ Ser 6570-8051-90 applications, Monterey, 13/14 Dec.90

"Recent progress in interferometric fiber Proceedings", Kersey , SPIE,V. 1367JFW 10/9/90 sensor technology\_ Ser 6570-8052. 1990.\*

"Recent advances in short pulse solid lasers MIT EECS Optics & Quant. Elect.Duling", Seminar JFW 10/10/90 Ser 6570-8053 Boston, MA, Oct. 17, \_90

"The development of photonic systs. for DARPA/RADC Symp.Antenna", Burns,Bulmer, Appl.JFW 10/11/90 Howerton EM field testing at NRL\_ Ser 6570-8054 Monterey, 13/14 Dec. 90

"EMP Testing with a fiber optic sensor", Moeller, Bulmer, DARPA/RADC Symp. Antenna Appl.JFW 10/11/90 Burns Ser 6570-8055(ABSTRACT) Monterey, 13/14 Dec. 90

"Depolarized source for photonic systs", Burns,Moeller, DARPA/RADC Symp. Antenna Appl. JFW 10/11/90 Bulmer,Greenblatt Ser 6570-8056Monterey, 13/14 Dec. 90

"Multiplexed interferometer fiber sensors", Kersey, 7th Optical fiber sensor conf.JFW 10/12/90 Ser 6570-8057 Sydney, Australia/4-6 Dec. 90/proceedings.\*

"Passive laser phase noise suppression Proceedings", Kersey,Berkoff SPIE, V1367JFW 10/19/90 technique for fiber interferometric\_ Ser 6570-8058, 1990.\*

"Novel analog phase tracker for interferometric Proceedings", Berkoff,Kersey \_ SPIE,V.1367 JFW 10/22/90 fiber optic sensor appliction\_ Ser 6570-8059, 1990.\*

"Photorefractive effects in proton exchanged Integrated Photonics", Howerton, Burns\_JFW 11/29/90 LiTabO3 waveguides Ser 6570-8068 Research/Monterey, Apr 9/12/90

"Overview of the Navy fiber optic sensor Proceedings/IEEE Lasers & Electrooptics", J. Dandridge, Kersey FW 12/3/90 program\_ Ser 6570-8069 Society 90 annual meeting/Nov.90

"Freq.-division based polarization Proceedings/IEEE Lasers & Electro-optics", Weis, Marrone, Kersey\_ JFW 12/3/90, Ser 6570-8070 diversity scheme for overcoming signal Society 90 annual mtg./ Nov. 90 fading in an interferometric sensor, 1990.\*

"Signal processing tech. for absolute 6570-8074 Optoelectronics & Laser Berkoff", Kersey JFW 12/21/90 displacement/strain sensing using a fiber interferometer\_ Engineering, Publ. 1992, (16), p.153-161

"Comparative fractography of chemical vapor and combustion deposited diamond films", H.A. Hoff, A.A. Morrish, J.E. Butler and B.B. Rath, published in J. Matls. Res. V. 5, p. 2572 (1990).

"Standing Magnetostatic Wave Modulator for Optical Communication." J.C. Butler, A.D. Fisher, J.J. Kramer, and J.N. Lee, presented at and published in Technical Digest for 1990 OSA Annual Meeting, Boston, MA, paper Th02, 8 Nov. 1990, and for publication in J. Opt. Soc. Amer. A.

"Convergence in the Spectral Domain Formulation of Waveguide and Scattering Problems", IEEE Trans. on Antennas and Propagation. June 1990, Vol. 38, pp869-877. J.K. Webb, P.W. Grounds, R. Mittra.

"The Structure and Properties of Ni Films Grown by Ion Beam Assisted Deposition", R.A. Kant, G.P. Chambers, B.D. Sartwell in Beam-Solid Interactions: Physical Phenomena, J. A. Knapp et al., eds., (Materials Research Society), pp. 67-72, (1990)

"Peptide Conformations in Crystals", I.L. Karle, P. Balaramin Protein Folding: Deciphering the Second Half of the Genetic Code, L.M. Gierasch et al., eds., pp. 75-84, (1990)

"Comparative Anatomy of Phospholipase A2 Structures", K.B. Ward, N. Pattabiraman in Biochemistry, Molecular Biology, and Physiology of Phospholipase A2 and Its Regulatory Factors, A.B. Mukherjee, ed., (Plenum Press), pp. 23-36, (1990)

"Use of the Connection Machine to Study Ultrasonic Wave Propagation in Materials", P.P. Delsanto, T. Whitcombe, H.H. Chaskelis, R.B. Mignogna in Elastic Waves and Ultrasonic Nondestructive Evaluation, S.K. Datta et al., eds., (Elsevier Science Publishers, North Holland), p 409, (1990)

"Kondo Effect." A.S. Edelstein, in Encyclopedia of Physics, Second Edition, R.G. Lerner et al., eds., (VCH Publishers), pp. 608-611, (1990)

"Optical and Electron Microanalysis of Cuprate Superconductors", H.A. Hoff, M.S. Osofsky, W.L. Lechter, L.E.

"High Temperature Superconducting Compounds II", Toth, L.E. Richards, C.S. Pande, S-H. Whang et al., eds., (The Minerals, Metals & Materials Society), pp. 407-419, (1990)

"High Temperature Superconducting Compounds II", E. McCafferty, P.P. Trzaskoma, P.M. Natishan in Advances in Localized Corrosion, H. Isaacs et al., eds., (NACE, Houston TX), p. 181, (1990)

"Organics VS Cuprates: Why is Tc Still So Low in the Organics?", S.A. Wolf, V.Z. Kresin in Organic Superconductivity, V.Z. Kresin et al., eds., (Plenum Press), p 31, (1990)

"Electron Spin Resonance", D. Griscom in Glass Science and Technology, Vol. 4B, Advanced in Structural Analysis, D. Uhlmann and N. Kreidl, eds., (Academic Press), pp. 151-251, (1990)

"The Effect of Triplets on the Shock Chemistry of 2,4 Dinitrostilbene", B. Justus, C. Merritt in Shock Waves in Condensed Matter - 1989, S. Schmidt, ed., (North Holland, NY), pp. 871-874, (1990)

"Metal Atom/Cluster Reactions via FTIR Matrix Isolation Studies: C-H vs C-C Bond Activation", Z. H. Kafafi in Selective Hydrocarbon Activation, J. A. Davies et al., eds., (VCH Publishers New York), pp. 411-432, (1990)

"Ultrafast Shock Induced Uniaxial Strain in a Liquid", C. Merritt, A. Huston, B. Justus, A. Campillo in Shock Waves in Condensed Matter - 1989, S. Schmidt, ed., (North Holland, NY), pp. 667-670, (1990)  
Spatial Effects in Transient Stimulated Raman Scattering

"Resonances", J. Reintjes, M. Duncan, R. Mahon, L. Tankersley, , M. Levenson et al., eds., (World Scientific Publishing, ), part III, pp. 70-79, (1990)

"Experimental Measurement of Very Small Angle Optical Stray Light Performance of Selected Acousto-optic Materials", J. Stover, D. Bjork, R. Brown, J. Lee in Growth and Characterization of Acousto-optical Materials, N. Singh, ed., (Trans. Tech. Publications, Switzerland), pp. 57-93, (1990)

"The Properties of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> Prepared by 3-Target Co-Sputtering", L.H. Allen, E.J. Cukauskas, P.K. VanDamme in Science and Technology of Thin Film Superconductors 2, R.D. McConnell et al. eds., (Plenum Press), p. 67, (1990)

"Status of Compound Semiconductor Device Reliability", W.T. Anderson, A. Christou in Semiconductor Device Reliability, A. Christou and B.A. Unger, eds. (Kluwer Academic Press) , 175, p. 423, (1990)

"A Distribution-Function Approach in Many-Body Quantum Transport Theory of Quantum-Based Devices", F.A. Buot, K.L. Jensen in Computational Electronics: Semiconductor Transport and Device Simulation, K. Hess et al., eds., (Kluwer Academic Publishers), (1990)

"Optically Detected Magnetic Resonance of Group IV and Group VI Donors in Al<sub>0.6</sub>Ga<sub>0.4</sub>As/GaAs Heterostructures", E. Glaser, T.A. Kennedy, B. Molnar, M. Mizuta in Impurities, Defects and Diffusion in Semiconductors: Bulk and Layered Structures, J. Bernholc et al. eds., (Materials Research Society), p. 753, (1990)

"The Inclusion of Scattering in the Simulation of Quantum Well Devices", K.L. Jensen, F.A. Buot in Computational Electronics: Semiconductor Transport and Device Simulation, K. Hess et al., eds. (Kluwer Academic Publishers), (1990)

"Optically-Detected Magnetic Resonance of Si-Doped Al<sub>x</sub>Ga<sub>(1-x)</sub>As", T.A. Kennedy, E.R. Glaser in Solid State Phenomena: Physics of D X Centers in GaAs Alloys, J.C. Bourgoin, ed., (Sci-Tech Publications), 10, 53-64, (1990)

"Stoichiometric Defects in InP", T.A. Kennedy, Chung P.J. Lin in Semiconductors and Semimetals, R.K. Willardson et al., eds., (Academic Press), 31, 357-389, (1990)



"Metal Contact Degradation on III-V Compound Semiconductors", G. Kiriakidis, W.T. Anderson, Z. Hatzopoulos, C. Michelakis, D.V. Morgan in NATO ASI Series Series E: Applied Sciences, (Kluwer Academic Publishers), 175, p. 269, (1990)

"The Symmetric and Fully Distributed Solution to Generalized Dining Philosophers Problem: An Analogue of the Coupling Theory of Relaxations in Complex Correlated Systems", K.L. Ngai, R.W. Rendell in Relaxations and Related Topics in Complex Systems, I. Campbell et al., eds., (Plenum Press), pp. 390-316, (1990)

"Antibody-Based Biosensor for Continuous Monitoring", A.W. Kusterbeck, G.A. Wemhoff, F.S. Ligler  
in Biosensor Technology by R.P. Buck et al., eds, (Marcel Dekker), pp. 345-350, (1990)

"Stabilization of Lipid Microstructures: Fundamentals and Applications", A.S. Rudolph, A. Singh, R.R. Price, B. Goins, B.P. Gaber in Targeting of Drugs, G. Gregoriadis et al., eds., (Plenum), pp. 103-115, (1990)

"Interpenetrating Polymer Networks", R.B. Fox, J.J. Fay, U. Sorathia, L.H. Sperling, Chapter 19, ACS Symposium Series No. 424, Sound and Vibration Damping with Polymers, R.D. Corsaro, L.H. Sperling, eds., (1990)

"Phthalonitrile Matrix Resins and Composites." T.M. Keller in International Encyclopedia of Composites, Vol. 4, (VCH Publishers), (1990)

"NMR Imaging of Solids With A Surface Coil", J.B. Miller, A.N. Garroway in Review of Progress in Quantitative Nondestructive Evaluation, Vol. 9A, 609, D.O. Thompson, D.E. Chimenti, eds., (Plenum Press), (1990)

"Proximal Probes: Techniques for Measuring at the Nanometer Scale", J.S. Murday, R.J. Colton in Chemistry and Physics of Solid Surfaces VIII, R. Vanselow and R. Howe, eds., Springer Series in Surface Science 22, (Springer-Verlag), pp. 347-370, (1990)

"Damping in Polydienes", C.M. Roland, C.A. Trask in ACS Symposium Series 424, Sound and Vibration "Damping with Polymers", R.D. Corsaro and L.H. Sperling, eds., Chapter 16, (1990)

"X-ray Photoelectron and Auger Electron Spectroscopy", N.H. Turner in Analytical Instrumentation Handbook, G.W. Ewing, ed., (Marcel Dekker), pp. 531, (1990)

"Fundamentals of Superconductivity", V.Z. Kresin, S.A. Wolf, (Plenum Press), (1990)

"Pulsed Laser-Induced SEU in Integrated Circuits: A Practical Method for Hardness Assurance Testing", S. Buchner, K. Kang, W. Stapor, A. Campbell, A.R. Knudson, P. McDonald, S. Rivet, IEEE Trans. Nucl. Sci. N5-37, 1825, (1990)

"Charged Particle Spectra of Palladium Thin Films During Low Energy Deuterium Ion Implantation", G.P. Chambers, J.E. Eridon, K.S. Grabowski, B.D. Sartwell, D.B. Chrisey, J. Fusion Energy, 9, 281-285, (1990)

"An Upper Limit on Cold Fusion in Thin Palladium Films", G.P. Chambers, J.E. Eridon, K.S. Grabowski  
Phys. Rev. B 41, pp. 5388-5391, (1990)

"Depth Profiles of Ag/Si(111) Thin-Film Interface Regions", G.P. Chambers, B.D. Sartwell, Surface and Interface Analysis, 15, pp. 126-134, (1990)

"Electronic Excitation of Condensed CO: Sputtering and Chemical Change", D.B. Chrisey, W.L. Brown, J.W. Boring, Surface Science 225, pp. 130-142, (1990)

"Composition Depth Profiles of High Temperature Superconducting Materials", by Energetic Elastic Backscattering  
C.R. Gossett, Scanning Microscopy, Vol. 4, No. 1, pp. 25-29, (1990)

"Photodissociation of Adsorbed Trimethylindium", J.S. Horwitz, E. Villa, D.S.Y. Hsu J. of Phys. Chem., 94, 7124, (1990)

"Laser and Mass Spectrometric Etching Studies of the Mechanism of Silicon <100> Single Crystal Etching Reactions", J.S. Horwitz, M.C. Lin, High Temperature Science, p. 27, p. 265, (1990)

"Physical Aspects of Ion Beam Assisted Deposition", G.K. Hubler, C.A. Carosella, E.P. Donovan, D. VanVechten, R.H. Bassel, T.D. Andreadis, M. Rosen, G.P. Mueller, Nucl. Inst. Meth. Phys. Res. B46, 384, (1990)

"Fundamentals of Ion Beam Assisted Deposition: II. Absolute Calibration of Ion and Evaporant Fluxes", G.K. Hubler, D. VanVechten, E.P. Donovan, C.A. Carosella, J. Vac. Sci. Technol. A8, 831, (1990)

"The Influence of Ion Bombardment on Reactions Between Ti and Gaseous N<sub>2</sub>", R.A. Kant, B.D. Sartwell  
J. Vac. Sci. Tech., A8, 861-867, (1990)

"Pulsed Laser-Induced Charge Collection in GaAs MESFETs", A.R. Knudson, A.B. Campbell, D.P. McMorrow, S. Buchner, K. Kang, T. Weatherford, V. Sivinas, G.A. Swartzlander Jr., Y.J. Chen, IEEE Trans. Nucl. Sci., NS-37, 1909, (1990)

"Charge Collection in Semiconductors— A Fundamental Process for Single Events", A.R. Knudson  
Bulletin of the American Physical Society, 35, p. 1709, (1990)

"Anodic Behavior of Ion Beam Mixed Surface Alloys", E. McCafferty, P.M. Natishan, G.K. Hubler  
Corros. Sci. 30, 209, (1990)

"Fast Charge Collection in GaAs MESFETS." D.P. McMorrow, A.R. Knudson, A.B. Campbell  
IEEE Trans. Nucl. sci., NS-37, p. 1902, (1990)

"An Embedded-Atom-Method Study of Diffusion of an Ag Adatom on (111) Ag", W.K. Rilling, C.M. Gilmore, T.D. Andreadis, J.A. Sprague, Canadian Journal of Physics, 68, 1035, (1990)

"Use of Ion Beam Assisted Deposition to Modify the Microstructure and Properties of Thin Films", F.A. Smidt  
International Materials Reviews, 35, pp. 61-128, (1990)

"Surface Modification", F.A. Smidt, Advanced Materials and Processes, pp. 61-62, (1990)

"Fundamentals of Ion Beam Assisted Deposition: I. Model of Process and Reproducibility of Film Composition", D. VanVechten, G.K. Hubler, E.P. Donovan, F.D. Correll, J. Vac. Sci. Technol. A8, 821, (1990)

- "Methyl Radical Formation from Filament Pyrolysis of Acetylene/Hydrogen Mixtures within Quartz Tubes", E. Villa, J.A. Dagata, J.S. Horwitz, D. Squire, M.C. Lin J. of Vac. Sci. Tech., A4, 3237, (1990)
- "Photochemistry of Adsorbed Trimethylindium at 22 nmz", E. Villa, J.S. Horwitz, D.S.Y. Hsu, Chem. Phys. Letters, 164, 587, (1990)
- "Quantitative X-ray Spectroscopy of Sodium Z-Pinch Plasmas for Na/Ne Photopumping", P.G. Burkhalter, G. Mehlman, J.P. Apruzese, D.A. Newman, V.E. Scherrer, F.C. Young, S.J. Stephanakis, D.D. Hinshelwood  
Journal of Quantitative Spectroscopy and Radiation Transfer, p. 44, No.5/6, (1990)
- "Techniques for Soft X-ray Absorption in Laser-Produced Plasmas", P.G. Burkhalter, G. Mehlman, D.A. Newman, B.H. Ripin, Review of Scientific Instruments, 61(10), 2741, (1990)
- "Nanoindentation Study of the Mechanical Properties of Copper-Nickel Multilayered Thin Films", R.C. Cammarata, T.E. Schlesinger, C. Kim, S.B. Qadri, A.S. Edelstein, Appl. Phys. Lett. 56 (19), p. 1862, (1990)
- "Phase Transition Characterization in Low Hydration Phases of Dilauroylphosphatidylcholine", J.M. Collins, L.J. Lis, S.B. Qadri, W. Tamura-Lis, P.J. Quinn, Journal of Colloid and Interface Science, (1990)
- Measurements of the Normal-Incidence X-ray Reflectance of a Molybdenum-Silicon Multilayer Deposited on a 2000 lines/mm Grating", R.G. Cruddace, T.W. Barbee Jr., J.C. Rife, W.R. Hunter, Physica Scripta. Vol. 41, p. 396, (1990)
- New Horizons in X-ray Fluorescence Analysis", J.V. Gilfrich, X-ray Spectrometry, 19, pp. 45-51, (1990)
- "Suppressing Higher Order Interference in VUV and Soft X-ray Multilayer Coatings Using Both Abrupt and Graded Boundaries", W.R. Hunter, Appl. Optics, (1990)
- "X-ray Absorption Fine-Structure Measurement of Single-Crystal Materials", K.H. Kim, W.T. Elam, E.F. Skelton, J.P. Kirkland, R.A. Neiser, Phys. Rev. B,42, pp. 724-726, (1990)
- "A UHV Compatible Fixed-Exit Two/Four Crystal Monochromator", J.P. Kirkland, W.T. Elam, Nuclear Instruments & Methods, (1990)
- "The Influence of Ca<sup>2+</sup> on the Subgel Phase and Transitions of Dipalmitoylphosphatidylcholine", L.J. Lis, W. Tamura-Lis, T. Mastran, D. Patterson, J.M. Collins, P.J. Quinn, S. Qadri, Mol. Cryst. Liq. Cryst. Vol. 178, pp. 11-19, (1990)
- "Surface Space-Charge Dynamics and Surface Recombination on Silicon (111) Surfaces Measured with Combined Laser and Synchrotron Radiation", J.P. Long, H.R. Sadeghi, J.C. Rife, M.N. K, Molecular Beam
- "Epitaxy of a Low-Strain II-VI Heterostructure: ZnTe/CdSe", H. Luo, N. Samarth, F.C. Zhang, M. Dobrowolska, J.K. Furdyna, K. Mahalingam, N. Otsuka, W.C. Chou, A. Petrou, S.B. Qadri, Appl. Phys. Lett., (1990)
- "Soft X-ray Continuum from Laser-Irradiated High-Z Targets", G. Mehlman, P.G. Burkhalter, D.A. Newman, R.H. Ripin, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, No. 5/6, pp. 495-507, (1990)

- "E-Beam Deposition of In<sub>2</sub>O<sub>3</sub> Stabilized ZrO<sub>3</sub> Films", S.B. Qadri, E.F. Skelton, M.Z. Harford, R. Jones, P. Lubitz, J. of Vac. Sci. and Technol. A., (1990)
- "Ion-Beam Deposition of Ag/Fe Multilayers and Their Structural and Magnetic Properties", S.B. Qadri, C. Kim, M. Twigg, P. Lubitz, M. Rubinstein, J. of Vac. Sci. and Technol. A., (1990)
- "Structural and Magnetic Properties of Ion-Beam Sputtered Deposited Cu/Fe Multilayers", S.B. Qadri, C. Kim, K.H. Kim, P. Lubitz, M. Twigg, J. of Vac. Sci. and Technol., (1990)
- "Lattice Parameter and Nearest-Neighbor Distances in Zn<sub>1-x</sub>Fe<sub>x</sub>Se<sub>0<x<0.22</sub>", S.B. Qadri, K.H. Kim, E.F. Skelton, J.K. Furdyna, J. Appl. Phys. 67(4), p. 2156, (1990)
- "E-beam Deposition of Tetragonal ZrO<sub>2</sub> Films Stabilized with Alumina and Scandia", S.B. Qadri, E.F. Skelton, M. Harford, P. Lubitz, J. of Vac. Sci. Technol. A8(3), p. 2344, (1990)
- "E-Beam Deposition of ZrO<sub>2</sub>-Sc<sub>2</sub>O<sub>3</sub> Films", S.B. Qadri, E.F. Skelton, M.Z. Harford, P. Lubitz, J. of Appl. Phys. 67(5), p. 2655, (1990)
- "Structural Characterization of Molecular-Beam Epitaxially Grown Zn<sub>1-x</sub>MnxSe and Zn<sub>1-x</sub>MnxSe/ZnSe Superlattices", S.B. Qadri, N. Samarth, J.K. Furdyna, J. of Vac. Sci. Technol. A 8 (3), p. 1884, (1990)
- "Wavelength Dispersive Diffraction Using a Diamond-Anvil Pressure Cell and Synchrotron X-ray Source", S.B. Qadri, R. Dobbyn, E.F. Skelton, Physica C, (1990)
- "X-ray Characterization of (Zn,Cd)Te/CdTe Strained Layer Superlattices", S.B. Qadri, J. of Vac. Sci. and Technol. A, (1990)
- "Performance of a Tungsten/Carbon Multilayer-Coated, Blazed Grating from 150 to 1700 eV", J.C. Rife, T.W. Barbee Jr., W.R. Hunter, R.G. Cruddace, Physica Scripta, Vol. 41, p. 418, (1990)
- "Applications of Multilayer Coated Gratings in Vacuum Ultraviolet and Soft X-ray Spectrometers", J.C. Rife Appl. Optics J., (1990)
- "Molecular Beam Epitaxy of Epilayers and Superlattices Involving ZnSe, CdSe, Zn<sub>1-x</sub>CdxSe and Cd<sub>1-x</sub>MnxSe", N. Samarth, H. Luo, J.K. Furdyna, S.B. Qadri, Y.R. Lee, R.G. Alonso, E.K. Suh, A.K. Ramdas, N. Otsuka, Surface Science, (1990)
- "Molecular Beam Epitaxy of Zn<sub>1-x</sub>CdxSe Epilayers and ZnSe/Zn<sub>1-x</sub>CdxSe Superlattices", N. Samarth, H. Luo, J.K. Furdyna, R.G. Alonso, Y.R. Lee, A.K. Ramdas, S.B. Qadri, N. Otsuka, Appl. Phys. Lett. 56(12) p. 1163, (1990)
- "Molecular Beam Epitaxy of CdSe and the Derivative Alloys Zn<sub>1-x</sub>CdxSe and Cd<sub>1-x</sub>MnxSe", N. Samarth, H. Luo, J.K. Furdyna, S.B. Qadri, Y.R. Lee, A.K. Ramdas, N. Otsuka, J. of Elect. Mat., (1990)
- "Thin-Film Interference Optics for Imaging the O II 834A Airglow", J.F. Seely, W.R. Hunter, Journal of Geophysical Research, (1990)
- "Novel Techniques for the Preparation of Synthetic Diamond", E.F. Skelton, A.W. Webb, S.B. Qadri, E.R. Carpenter Jr., M., Z. Harford, P. Lubitz, M. Twigg, High Pressure Research 1990, Vol. 5, pp. 914-916, (1990)

"Ethanol-Phosphatidylcholine Interactions: A Real Time X-ray Diffraction Study", W. Tamura-Lis, L.J. Lis, S. Qadri, P.J. Quinn, Mol. Cryst. Liq. Cryst., Vol. 178, pp. 79-88, (1990)

"Direct Measurements of Compressive and Tensile Strain During Shock Breakout by Use of Sub-Nanosecond X-ray Diffraction", J.S. Wark, G. Kiehn, R.R. Whitlock, N.C. Woolsey, J. of Appl. Phys. 68(9), p. 4531, (1990)

"Search for Superconductivity in 225 Compositions of 19 New Metal-La-Cu-O Systems", A.W. Webb, E.F. Skelton, S.B. Qadri, V. Browning, E.R. Carpenter Jr., Phys. Rev. B., (1990)

"Separation of Radiation Induced and Process Induced Lateral Non-Uniformities", M.A. Xapsos, R.K. Freitag, C.M. Dozier, D.B. Brown, G.P. Summers, E.A. Burke, P. Shapiro, IEEE Trans. Nucl. Sci. Vol. 17, No. 6, p. p. 1624, (1990)

"Comparison of Experimental and Theoretical Densities of States in CoSi<sub>2</sub>, E. Belin." C. Senemaud, L. Martinage, J.Y. Veuillen, D.A. Papaconstantopoulos, A. Pasturel, F. Cyrot-Lackmann, J. Phys. Condens. Matter 2, 3247, (1990)

"First Principles Calculations for Ferroelectrics— A Vision", L.L. Boyer, R.E. Cohen, H. Krakauer, W.A. Smith  
Ferroelectrics 111, 1, (1990)

"Statics and Dynamics of Icosahedrally Twinned and Single-Crystal fcc Clusters", L.L. Boyer, J.Q. Broughton  
Phys. Rev. B42, p. 11461, (1990)

"Perovskite to Antiperovskite in ABF<sub>3</sub> Compounds", L.L. Boyer, P.J. Edwardson, Ferroelectrics 104, p. 417, (1990)

"Relating Double Wells to Phase Transitions from ab initio Model Calculations", L.L. Boyer, Ferroelectrics 111, 63, (1990)

"High T<sub>c</sub> Superconductors as Ionic Metals and the Role of Phonons in High T<sub>c</sub> Superconductivity", R.E. Cohen, W.E. Pickett, H. Krakauer, D.A. Papaconstantopoulos, Phase Transitions 22, 167, (1990)

"Theoretical Determination of Strong Electron-Phonon Coupling in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>", R.E. Cohen, W.E. Pickett, H. Lu, H. Krakauer, Physica B p. 165&166, p. 1057, (1990)

"Lattice Dynamics and Origin of Ferroelectricity in BaTiO<sub>3</sub>: Linearized-Augmented-Plane-Wave Total Energy Calculations", R.E. Cohen, H. Krakauer, Phys. Rev. B42, p. 6416, (1990)

"Improved Nth Order Averaging Theory for Periodic Systems", J.A. Ellison, A.W. Saenz, H.S. Dumas  
Journal of Differential Equations, p. 84, p. 383, (1990)

"First-Principles, General-Potential Local Orbital Calculations for Bulk Crystals", S.C. Erwin, M.R. Pederson, W.E. Pickett, Phys. Rev. B41, p. 10437, (1990)

"First-Principles Supercell Studies of the Nitrogen Impurity in Diamond", S.C. Erwin, W.E. Pickett, Phys. Rev. B42, p. 11056, (1990)

- "Metallization Pressure for NaCl in the B2 Structure", J.L. Feldman, B.M. Klein, M.J. Mehl, H. Krakauer  
Phys. Rev. B42, p. 2752, (1990)
- "Ferroelectric Phase Transitions in NaCa-halide Perovskites", J.W. Flocken, W.N. Mei, R.A. Guenther, J.R. Hardy, P.J. Edwardson, L.L. Boyer, Ferroelectrics 104, p. 411, (1990)
- "Production of Laser Radiation in Aligned Crystal Targets", R. Fusina, J. Opt. Soc. of Am. B7, p. 2076, (1990)
- "Polarization of Radiation from Axially Channeled Electrons", R. Fusina, Phys. Rev. B42, p. 7706, (1990)
- "Calculated Elastic and Thermal Properties of MGO at High Pressures and Temperatures", D.G. Isaak, R.E. Cohen, M.J. Mehl, Journal of Geophysical Research, p. 95, p. B5, p. 7055, (1990)
- "Donor Levels and Impurity Atom Relaxation in Nitrogen and Phosphorous-Doped Diamond", K.A. Jackson, M.R. Pederson, J.G. Harrison, Phys. Rev. B41, p. 12641, (1990)
- "Accurate Forces in a Local-Orbital Approach to the Local-Density Approximation", K.A. Jackson, M.R. Pederson, Phys. Rev. B42, p. 3276, (1990)
- "Effects of Autoionizing Resonances on Density-Sensitive Spectral-Line Intensity Ratios in High-Temperature Plasmas", V.L. Jacobs, P.L. Hagelstein, M.H. Chen, R. Minner, J.F. Seely, Phys. Rev. A41, p. 1041, (1990)
- "Theoretical Study of Native Defects and Impurities in InP", R.W. Jansen, Phys. Rev. B41, p. 7666, (1990)
- "Interpretation of the Electronic Structure of Ba(K)Pb(Bi)O<sub>3</sub> via the Alternating Lattice Method", J.P. Julien, A. Pasturel, D. Mayou, F. Cyrot-Lackmann, D.A. Papaconstantopoulos, Physica Scripta 42, p. 359, (1990)
- "Effect of Surface Reconstruction on Stability and Reactivity of Si Clusters", E. Kaxiras, Phys. Rev. Lett. 64, p. 551, (1990)
- "Liquid Arsenic: Comparison of ab initio and Pair-Potential Predictions of Molecular Structure", X-P. Li, P.B. Allen, R. Car, M. Parrinello, J.Q. Broughton, Phys. Rev. B41, p. 3260, (1990)
- "Transport-Theory Approach to Ion-Beam Mixing and Recoil Implantation", I. Manning, Phys. Rev. B42, p. 9853, (1990)
- "Electronic Structure of Transition Metal Disilicides", L. Martinage, A. Pasturel, D. Papaconstantopoulos, F. Cyrot-Lackmann, Physica Scripta 42, p. 363, (1990)
- "Structural Properties of Ordered High-Melting-Temperature Intermetallic Alloys from First Principles Total Energy Calculations", M.J. Mehl, J.E. Osburn, D.A. Papaconstantopoulos, B.M. Klein, Phys. Rev. B41, p. 10311, (1990)
- "A Variational Mesh for Quantum Mechanical Simulations", M.R. Pederson, K.A. Jackson, Phys. Rev. B41, 7453, (1990)

- "Quasiparticle Scattering Across the Fermi Surface in  $\text{La}_{2-x}\text{M}_x\text{CuO}_4$ ." W.E. Pickett, H. Krakauer, R. Cohen  
Physica B p. 165&166, p. 1055, (1990)
- "Precise Band Structure and Fermi Surface Calculations for  $\text{YBa}_2\text{Cu}_3\text{O}_7$ : Importance of Three-Dimensional Dispersion", W.E. Pickett, R.E. Cohen, H. Krakauer, Phys. Rev. B42, Rapid Comm., p. 8764, (1990)
- "Electronic Structure of an Ideal Diamond/Nickel (001) Interface", W.E. Pickett, S.C. Erwin, Phys. Rev. B41, p. 9756, (1990)
- "Total Energy Calculations of Solid H", Li, Na, K, Rb, and Cs, M. Sigalas, N.C. Bacalis, D.A. Papaconstantopoulos, M.J. Mehl, A.C. Switendick, Phys. Rev. B42, p. 11637, (1990)
- "Magnetism in Layered Oxides: Results from Spin Density Functional Calculations", D.J. Singh, W.E. Pickett, R.E. Cohen, D.A. Papaconstantopoulos, H. Krakauer, Physica B163, p. 470, (1990)
- "Theoretical Electron-Positron Zone Reduced Momentum Density for  $\text{YBaCu}_3\text{O}_7$ : Fermi Surface and Wavefunction Effects", D.J. Singh, W.E. Pickett, E.C. von Stetten, S. Berko, Phys. Rev. B42, p. 2696, (1990)
- "Possibility of  $\text{LiPdH}_x$  as a New Ionic Superconductor", D.J. Singh, R.E. Cohen, D.A. Papaconstantopoulos  
Phys. Rev. B41, p. 861, (1990)
- "Equilibrium Properties of Zinc", D.J. Singh, D.A. Papaconstantopoulos, Phys. Rev. B42, p. 8885, (1990)
- "Calculation of the Line Emission from Cylindrical Krypton Plasmas Using a 162-Level, 511-Line Detailed Configuration Atomic Model", J.P. Apruzese, P.C. Kepple, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, p. 529, (1990)
- "Aluminum Wire Array Implosions: Comparison of Experiments and Simulation", J.L. Giuliani, Jr, J.E. Rogerson, C. Deeney, T. Nash, R.R. Prasad, M. Krishnan, Journal of Quantitative Spectroscopy and Radiation Transfer, p. 44, p. 471, (1990)
- "Transition From I4 to I2 Scaling of K-Shell Emission in Aluminum Array Implosions", J.W. Thornhill, K.G. Whitney, J. Davis, Journal of Quantitative Spectroscopy and Radiation Transfer, p. 44, p. 251, (1990)
- "Basic Considerations for Scaling Z-Pinch X-ray Emission with Atomic Number", K.G. Whitney, J.W. Thornhill, J.P. Apruzese, J. Davis, Journal of Applied Physics 67(4), p. 1725, (1990)
- "Evolution of an X-Pinch Plasma", F.L. Cochran, J. Davis, Physics of Fluids B, p. 2(6), p. 1238, (1990)
- "Comparison of Coolants for Achieving Short-Wavelength Recombination Lasing", J.W. Thornhill, J.P. Apruzese, J.L. Giuliani, D. Roelant, Journal of Applied Physics, p. 68(1), p. 33, (1990)
- "Imploding Neon Puff-Gas Plasmas II", R.W. Clark, J. Davis, Physics of Fluids B, p. 2(7), p. 1698, (1990)

"Stability of a Z Pinch at the Pease-Braginskii Current", F.L. Cochran, A.E. Robson, Physics of Fluids B, p. 2(9), p. 2270, (1990)

"Scaling of Dielectronic-Recombination Data in Fluorinelike Ions", A. Dasgupta, K.G. Whitney, Physical Review A, p. 42, p. 2640, (1990)

"A New Procedure for Analyzing X-Ray Spectra from Laboratory Plasmas", M.C. Coulter, K.G. Whitney, J.W. Thornhill, Journal of Quantitative Spectroscopy and Radiation Transfer, p. 44, p. 443, (1990)

"Absolute Intensity of a Sodium-Like Resonance Line for Temperature Diagnosis of Neon-Like X-ray Laser Plasmas", M.C. Coulter, J.P. Apruzese, K.G. Whitney, Applied Physics B, p. 50, p. 193, (1990)

"Radius Scaling Effects in Nickel Wire Array Z-Pinches", C. Deeney, T. Nash, P.D. Lepell, K. Childers, M. Krishnan, K.G. Whitney, J.W. Thornhill, Journal of Quantitative Spectroscopy and Radiation Transfer, p. 44, p. 457, (1990)

"X-Pinch Wire Load Experiments on Blackjack5", N. Loter, M. Gersten, R. Grandey, M. Coulter, J. Davis, K. Whitney, Journal of Quantitative Spectroscopy and Radiation Transfer, p. 44, p. 507, (1990)

"Efficient Generation of Multigigawatt Rf Power by a Klystronlike Amplifier." M. Friedman, J. Krall, Y.Y. Lau, V. Serlin, Review of Scientific Instruments, p. 61, p. 171, (1990)

"Efficient Second Harmonic Conversion of Broad-Band High-Peak-Power Nd: Glass Laser Radiation Using Large-Aperture KDP Crystals in Quadrature", M.S. Pronko, R.H. Lehmborg, S. Obenschain, C.J. Pawley, C.K. Manka, R. Eckardt, IEEE Journal of Quantum Electronics, p. 26, p. 337, (1990)

"Time-Resolved, Simultaneous Density, Temperature, and Absorption Measurements in Dense Laser-Produced Plasmas", K.J. Kearney, A.N. Mostovych, J.A. Stamper, Review of Scientific Instruments, p. 61, p. 3596, (1990)

"Efficient Second Harmonic Conversion of Broad-Band High-Peak-Power Nd: Glass Laser Radiation Using Large-Aperture KDP Crystals in Quadrature", M.S. Pronko, R.H. Lehmborg, S. Obenschain, C.J. Pawley, C.K. Manka, R. Eckardt, IEEE Journal of Quantum Electronics, p. 26, p. 2, (1990)

"Neutron Measurements on ZFX", K.A. Gerber, J.D. Sethian, Review of Scientific Instruments, p. 61, p. 3169, (1990)

"Theory of Magnetically Insulated Electron Flows in Coaxial Pulsed Power Transmission Lines", R.I. Lawconnell, J.M. Neri, Physics of Fluids B, p. 2, p. 629, (1990)

"Soft X-Ray Material-Response Simulation with Intense Light-Ion Beams", S.H. Richter, L.M. Lee, D.V. Keller, D. Mosher, S.J. Stephanakis, F.C. Young, Journal of Radiation Effects, Research & Engineering, p. 9, p. 252, (1990)

"Quantitative X-ray Spectroscopy of Sodium Z-Pinch Plasma for Na/Ne Photopumping", P.G. Burkhalter, G. Mehlman, J.P. Apruzese, D.A. Newman, V.E. Scherrer, F.C. Young, S.J. Stephanakis, D.D. Hinshelwood  
Journal of Quantitative Spectroscopy and Radiation Transfer, p. 44, p. 495, (1990)



"High-Fluence Large-Area MeV Proton-Beam Diagnostics", F.C. Young, S.J. Stephanakis, V.E. Scherrer, D. Mosher, S.H. Richter, Review of Scientific Instruments, p. 61, p. 3122, (1990)

"Differential Memory in the Trilinear Model Magnetotail", J. Chen, H.G. Mitchell, P.J. Palmadesso, Journal of Geophysical Research, p. 95, p. 15141, (1990)

"Fractal Boundaries in Magnetotail Particle Dynamics", J. Chen, J.L. Rexford, Y.C. Lee, Geophysical Research Letters, p. 17, p. 1049, (1990)

"Equilibrium of Solar Coronal Arcades", J.M. Finn, J. Chen, The Astrophysical Journal, p. 349, p. 345, (1990)

"Magnetic Reconnection in Collisionless Plasmas: Prescribed Fields", G.R. Burkhart, J.F. Drake, J. Chen  
Journal of Geophysical Research, p. 95, p. 18833, (1990)

"Observational Signatures of Nonlinear Magnetotail Particle Dynamics", J. Chen, G.R. Burkhart, C.Y. Huang  
Geophysical Research Letters, p. 17, p. 2237, (1990)

"Plasma Instabilities in the High-Latitude E Region Induced by High-Power Radio Waves", P.K. Chaturvedi, S.L. Ossakow, Journal of Geophysical Research, p. 95, p. 15185, (1990)

"Simulation of Electrostatic Turbulence Due to Sheared Flows Parallel and Transverse to the Magnetic Field", K.I. Nishikawa, G. Ganguli, Y.C. Lee, P.J. Palmadesso, Journal of Geophysical Research, p. 95, p. 1029, (1990)

"Equilibrium Structure of the Plasma Sheet Boundary Layer-Lobe Interface", H. Romero, G. Ganguli, P. Palmadesso, P.B. Dusenbery, Geophysical Research Letters, p. 17, p. 2313, (1990)

"Scaling Laws for the Spectrum of Interchange Instabilities in the High-Latitude Ionosphere", M.J. Keskinen  
Journal of Geophysical Research, p. 95, p. 19137, (1990)

"Nonlinear Evolution of High-Latitude Ionospheric Interchange Instabilities with Scale-Size-Dependent Magnetospheric Coupling", M.J. Keskinen, J.D. Huba, Journal of Geophysical Research, p. 95, p. 15157, (1990)

"Universal Interchange Instability in Partially Ionized Gases", J.D. Huba, Physics of Fluids B, p. 2(11), p. 2547, (1990)

"Stability of Sub-Alfvénic Plasma Expansions", J.D. Huba, A.B. Hassam, D. Winske, Physics of Fluids B, p. 2(7), p. 1676, (1990)

"Nonlinear Evolution of the Unmagnetized Ion Rayleigh-Taylor Instability", A.B. Hassam, J.D. Huba  
Physics of Fluids B, p. 2(9), p. 2001, (1990)

"Three-Dimensional Simulation Study of Ionospheric Plasma Clouds", S.T. Zalesak, J.F. Drake, J.D. Huba  
Geophysical Research Letters, p. 17, p. 1597, (1990)

- "Comment on Interaction of Electromagnetic Waves in the Ionosphere", by V. N. Laxmi and A. K. Saha  
P.A. Bernhardt, S.T. Zalesak, F.T. Djuth, Radio Science, p. 25, p. 85, (1990)
- "Artificial Ion Beam Instabilities 1. Linear Theory", W.A. Scales, P.M. Kintner, Journal of Geophysical Research, p.95, p. 10623, (1990)
- "The Measurement of Vacuum-UV Line Intensities for Neon-Like Ions Generated in a Theta-Pinch Device", R.C. Elton, R.U. Datla, J.R. Roberts, A.K. Bhatia, Physica Scripta, p. 41, p. 440, (1990)
- "Characterisation of Soft X-ray Amplification Observed in Ne-Like Germanium", D.M. O'Neill, C.L.S. Lewis, D. Neely, J. Uhomoihi, M.H. Key, A. MacPhee, G.J. Tallents, S.A. Ramsden, A. Rogoyski, E.A. Mclean, G.J. Pert, Optics Communications, p. 75, p. 406, (1990)
- "Techniques for Soft X-ray Absorption in Laser-Produced Plasmas", P.G. Burkhalter, G. Mehlman, D.A. Newman, B.H. Ripin, Review of Science Instruments 61(10), p. 2741, (1990)
- "Laboratory Laser-Produced Astrophysical-Like Plasmas", B.H. Ripin, C.K. Manka, T.A. Peyser, E.A. McLean, J.A. Stamper, A.N. Mostovych, J. Grun, K. Kearney, J.R. Crawford, J.D. Huba, Laser and Particle Beams, p. 8, p. 1, p. 183, (1990)
- "Artificial Ion Beam Instabilities 2. Simulations", W.A. Scales, P.M. Kintner, Journal of Geophysical Research, p. 95, p. 10643, (1990)
- "Quasilinear Theory of Radiation Saturation in a Free-Electron Laser", W.P. Marable, P.A. Sprangle, Journal of Applied Physics, p. 67(8), p. 3576, (1990)
- "Relativistic Klystron Amplifiers Driven by Modulated Intense Relativistic Electron Beam", Y.Y. Lau, M. Friedman, J. Krall, V. Serlin, IEEE Transactions on Plasma Science, p. 18, (1990)
- "Illumination Uniformity of Spherical Targets Using Kilojoule-Scale Lasers With Optical Smoothing", D.G. Colombant, A.J. Schmitt, Applied Physics, p. 67, p. 2303, (1990)
- "Nonlinear Beam Loading and Dynamical Limiting Currents in a High-Power Microwave Gap", D.G. Colombant, Y.Y. Lau, Physical Review Letters, p. 64, p. 2320, (1990)
- "Frequency Shifts Induced in Laser Pulses", by Plasma Waves, E. Esarey, A. Ting, P. Sprangle, Physical Review A, p. 42, p. 3526, (1990)
- "Vlasov Theory of Wiggler Field Errors and Radiation Growth in a Free-Electron Laser", W.P. Marable, E. Esarey, C.M. Tang, Physical Review A, p. 42, p. 3006, (1990)
- "Electron Beam Propagation Through a Magnetic Wiggler", E. Esarey, A. Ting, Physical Review Letters, p. 65, p. 1961, (1990)
- "Radiation Guiding and Efficiency Enhancement in the Cyclotron Autoresonance Maser", R.G. Kleva, B. Levush, P. Sprangle, Physics of Fluids B, p. 2(1), p. 185, (1990)
- "Nonlinear Interaction of Intense Laser Pulses in Plasmas", P. Sprangle, E. Esarey, A. Ting, Physical Review A, p. 41, p. 4463, (1990)
- "Nonlinear Theory of Intense Laser-Plasma Interactions", P. Sprangle, E. Esarey, A. Ting, Physical Review Letters, p. 64, p. 2011, (1990)

"Efficiency Enhancement and Optical Guiding in a Tapered High-Power Finite-Pulse Free-Electron Laser", B. Hafizi, A. Ting, P. Sprangle, C.M. Tang, Physical Review Letters, p. 64, p. 180, (1990)

"Synchrotron-Betatron Parametric Instability in Free-Electron Lasers", B. Hafizi, A. Ting, Physical Review A, p. 41, p. 2877, (1990)

"Nonlinear Wake-Field Generation and Relativistic Focusing of Intense Laser Pulses in Plasmas", A. Ting, E. Esarey, P. Sprangle, Physics of Fluids B, p. 2(6), p. 1390, (1990)

"High-Energy Electron Beam Deposition and Plasma Velocity Distribution in Partially Ionized N<sub>2</sub>", S.P. Slinker, A.W. Ali, R.D. Taylor, Journal of Applied Physics, p. 67(2), p. 679, (1990)

"Megavolt, Multikiloamp Ka Band Gyrotron Oscillator Experiment." W.M. Black, S.H. Gold, A.W. Fliflet, D.A. Kirkpatrick, W.M. Manheimer, R.C. Lee, V.L. Granatstein, D.L. Hardesty, A.K. Kinkead, M. Suzy  
Physics of Fluids B, p. 2(1), p. 193, (1990)

"Measurement of Plasma-Neutralized Super-Vacuum Currents in a Gyrotron Configuration", D.A. Kirkpatrick, S.H. Gold, W.M. Manheimer, W.M. Black, A.K. Kinkead, D.L. Hardesty, Applied Physics Letters, p. 57(5), p. 437, (1990)

"Millimeter-Wave Gyroklystron Amplifier Experiment Using a Relativistic Electron Beam", S.H. Gold, A.W. Fliflet, W.M. Manheimer, D.A. Kirkpatrick, W.M. Black, A.K. Kinkead, D.L. Hardesty, M.S. Suzy  
IEEE Transactions on Plasma Science, p. 18, p. 1021, (1990)

"Improved Beam Confinement in the Modified Betatron with Strong Focusing", C.A. Kapetanakos, L.K. Len, T. Smith, J. Golden, K. Smith, S.J. Marsh, D. Dialetis, J. Mathew, P. Loschialpo, J.H. Chang, Physical Review Letters, p. 64, p. 2374, (1990)

"Review of Quasi-Optical Gyrotron Development", A.W. Fliflet, T.A. Hargreaves, R.P. Fischer, W.M. Manheimer, P. Sprangle, Journal of Fusion Energy, p. 9, p. 31, (1990)

"Design Principles for a Sheet-Beam Electron Gun for a Quasi-Optical Gyrotron", W.M. Manheimer, A.W. Fliflet, R. Lee, IEEE Transactions on Electron Devices, p. 37, p. 840, (1990)

"Initial Operation of a High-Power Quasi-Optical Gyrotron", A.W. Fliflet, T.A. Hargreaves, W.M. Manheimer, R.P. Fischer, M.L. Barsanti, IEEE Transactions on Plasma Science, p. 18, p. 306, (1990)

"Operating Characteristics of a Continuous-Wave-Relevant Quasioptical Gyrotron with Variable Mirror Separation", A.W. Fliflet, T.A. Hargreaves, W.M. Manheimer, R.P. Fischer, M.L. Barsanti, B. Levush, T. Antonsen Physics of Fluids B, p. 2(5), p. 1046, (1990)

"Foil Focusing of Electron Beams", R.F. Fernsler, R.F. Hubbard, S.P. Slinker, Journal of Applied Physics, p. 68(12), p. 5985, (1990)

"Electron-Beam Quality in Free-Electron Lasers", C.W. Roberson, B. Hafizi, Nuclear Instruments and Methods in Physics Research A, p. 296, p. 477, (1990)

"The Impact of Field-Error Reduction Techniques on FEL Performance", W.P. Marable, E. Esarey, C.M. Tang  
Nuclear Instruments and Methods in Physics Research A, p. 296, p. 499, (1990)

"Effect of Tapering on Optical Guiding and Sideband Growth in a Finite-Pulse Free-Electron Laser", B. Hafizi, A. Ting, P. Sprangle, C.M. Tang, Nuclear Instruments and Methods in Physics Research A, p. 296, p. 442, (1990)

"The Effects of Wiggler Errors on Free-Electron-Laser Performance", E. Esarey, W. Marable, C.M. Tang  
Nuclear Instruments and Methods in Physics Research A, p. 296, p. 423, (1990)

"Synchrotron-Betatron Parametric Instability in Free-Electron Lasers", B. Hafizi, A. Ting, Nuclear Instruments and Methods in Physics Research A, p. 296, p. 468, (1990)

"The NIST-NRL Free-Electron-Laser Facility", R.G. Johnson, R.L. Ayres, J.B. Broberg, R.I. Cutler, P.H. Debenham, B.C. Johnson, E.R. Lindstrom, D.L. Mohr, J.E. Rose, J.K. Whittaker, N.D. Wilkin, M.A. Wilson, S. Penner, C.M. Tang, P. Sprangle, Nuclear Instruments and Methods in Physics Research A, p. 296, p. 25, (1990)

"High-Power Free-Electron Lasers Driven by RF Linear Accelerators", T.F. Godlove, P. Sprangle, Particle Accelerators, p. 34, p. 169, (1990)

"Laser Produced Optically-Thin Strongly Coupled Plasmas", A. N. Mostovych, K. J. Kearney, and J. A. Stamper, Strongly Coupled Plasma Physics, S. Ichimaru, ed. Elsevier, (1990)

"Electron Accelerators Driven by Modulated Intense Relativistic Electron Beams", M. Friedman, V. Serlin, Y. Y. Lau and J. Krall, Intense Microwave and Particle Beams, SPIE, p. 1226, p. 416, (1990)

"The Influence of Beam Loading on the Operation of the Relativistic Klystron Amplifier", M. Friedman, V. Serlin, D. Colombant, J. Krall and Y. Y. Lau, Intense Microwave and Particle Beams, SPIE, p. 1226, p. 2, (1990)

"Dynamics, Catastrophe and Magnetic Energy Release of Toroidal Solar Current Loops", J. Chen, Geophysical Monograph 58, p. 269, (1990)

"Collective Effects in the Free Electron Laser", P. Sprangle, C. M. Tang, C. W. Roberson, Laser Handbook, p. 6, p. 8, (1990)

"Synthesis and X-ray Crystal Structure of 1,3,3-Trinitroazetidene", T.G. Archibald, R. Gilardi, K. Baum, C. George, J. Org. Chem., 55, pp. 2920-2924, (1990)

"Reactions of 1-Nitro-2-(trialkylsilyl)acetylenes", J.C. Bottaro, R.J. Schmidt, C.O. Bedford, R. Gilardi, C. George, Journal of Organic Chemistry, p. 55, pp. 1916-1919, (1990)

"aS, 7S-absolute Configuration of Natural (-)-Colchicine and Allo-congeners", A. Brossi, O. Boye, A. Muzaffar, H.J.C. Yeh, V. Toome, B. Wegrzynski, C. George, FEBS, p. 262 (1), pp. 5-7, (1990)

"Structure of Ethyl(2,4,6-Trinitrophenyl)carbamate", D. Dudis, R. Gilardi, Acta Cryst., C46, pp. 648-650, (1990)

"Cubanourea: A Cubane-Propellane", P.E. Eaton, K. Pramod, R. Gilardi, *J. Org. Chem.*, 55, pp. 5746-5750, (1990)

"Structure of a Dimer Ketone Formed via Fe(CO)<sub>5</sub>-Promoted Coupling of 7-(p-Cyanophenoxy)norbormadiene to Carbon Monoxide", J.L. Flippen-Anderson, R. Gilardi, C. George, *Acta Cryst.*, C46, pp. 807-809, (1990)

"Structures of 2,5,7,9-Tetranitro-8-oxo-2,5,7,9-tetraazabicyclo[4.3.0]nonane (I) and 2,5,7,9-Tetranitro-8-acetoxy-2,5,7,9-tetraazabicyclo[4.3.0]nonane (II)", J.L. Flippen-Anderson, C. George, R. Gilardi, *Acta Cryst.*, C46, pp. 1122-1125, (1990)

"Structure of 1,3-Dinitro-1,3-diazacyclopentan-2-one", C. George, J.L. Flippen-Anderson, R. Gilardi  
*Acta Cryst.*, C46, pp. 703-704, (1990)

"The Crystal Structure of Ethyl (2,4,6-trinitrophenyl) Carbamate, DMSO Solvate", C. George, D. Dudis  
*Acta Cryst.*, C46, pp. 650-652, (1990)

"The Structure of T-2 Toxin", R. Gilardi, C. George, J.L. Flippen-Anderson, *Acta Cryst.*, C46, pp. 645-648, (1990)

"Structures of 1,3,5-Trinitro-2-oxo-1,3,5-triazacyclohexane (I) and 1,4-Dinitro-2,5-dioxo-1,4-diazacyclohexane (II)", R. Gilardi, J.L. Flippen-Anderson, C. George, *Acta Cryst.*, C46, pp. 706-708, (1990)

"(t-Bu)<sub>2</sub>GaAs(t-Bu)<sub>2</sub>: A Volatile Monomeric Arsinogallane", K. Higa, C. George,  
*Organometallics*, 9, pp. 275-277, (1990)

"Conformational Effects in Trichothecenes: Structures of 15-Hydroxy C<sub>4</sub> and C<sub>8</sub> Keytones", B.B. Jarvis, D.B. Mazzocchi, H.L. Ammon, E.P. Mazzola, J.L. Flippen-Anderson, R.D. Gilardi, C.F. George, *J. Org. Structure*, 55, pp.3660-3662, (1990)

"Peptide Design: Influence of a Guest Aib-Pro Segment on the Stereochemistry on an Oligo-Val Sequence — Solution Conformations and Crystal Structure of Boc-(Val)<sub>2</sub>-Aib-Pro-(Val)<sub>3</sub>-OMe", I.L. Karle, J.L. Flippen-Anderson, K. Uma, H. Balaram, P. Balaram, *Biopolymers*, 29, pp. 1433-1442, (1990)

"Modular Design of Synthetic Protein Mimics. Crystal Structures, Assembly, and Hydration of Two 15- and 16-Residue Apolar", I.L. Karle, J.L. Flippen-Anderson, K. Uma, M. Sukumar, P. Balaram, *J. Amer. Chem. Soc.*, 112, pp. 9350-9356, (1990)

"Parallel and Antiparallel Aggregation of alpha-helices", I.L. Karle, J.L. Flippen-Anderson, M. Sukumar, P. Balaram, *Int. J. Peptide Res.*, 35, pp. 518-526, (1990)

"Apolar Peptide Models for Conformational Heterogeneity, Hydration, and Packing of Polypeptide Helices: Crystal Structure of Hepta- and Octa-peptides Containing -Aminoisobutyric Acid", I.L. Karle, J.L. Flippen-Anderson, K. Uma, P. Balaram, *Proteins: Structure, Function, and Genetics*, 7, pp. 62-73, (1990)

"Helix Construction Using alpha-Aminoisobutyryl Residues in a Modular Approach to Synthetic Protein Design. Conformational Properties of an Apolar Decapeptide in Two Different Crystal Forms and in Solution", I.L. Karle, J.L. Flippen-Anderson, K. Uma, P. Balaram, *Current Science*, p. 59, p. 17-18, pp. 875-876, (1990)

"Parallel Zippers Formed by alpha-Helical Peptide Columns in Crystals of Boc-Aib-Glu(OBzl)-Leu-Aib-Ala-Leu-Aib-Ala-Lys(Z)-Aib-OMe", I.L. Karle, J.L. Flippen-Anderson, K. Uma, P. Balaram, Proceedings of the National Academy of Science USA, p. 87, pp. 7921-7925, (1990).\*

"Synthetic Peptide Helices in Crystals: Structure and Antiparallel and Skewed Packing Motifs for alpha-Helices in Two Isomeric Decapeptides", I.L. Karle, J.L. Flippen-Anderson, K. Uma, P. Balaram, Biopolymers, p. 30, pp. 719-731, (1990)

"Helix Aggregation in Peptide Crystals: Occurrence of Either All Parallel or Antiparallel Packing Motifs for alpha-Helices in Polymorphs of Boc-Aib-Ala-Leu-Ala-Leu-Aib-Leu-Ala-Leu-Aib-OMe", I.L. Karle, J.L. Flippen-Anderson, K. Uman, P. Balaram, Biopolymers, p. 29, pp. 1835-1845, (1990)

"Structure Characteristics of alpha-Helical Peptide Molecules Containing Aib Residues", I.L. Karle, P. Balaram  
Biochemistry, p. 29, pp.6747-6756, (1990)

"Vernamycin B", I.L. Karle, J.L. Flippen-Anderson, Acta Cryst., p. C46, pp. 303-306, (1990)

"Structural Comparison of the Potent Antimuscarinic Agent Azapropfen Hydrochloride with Aprophen Hydrochloride and Structurally Related Antimuscarinic Agents", J. Karle, I.L. Karle, P.K. Chiang, Acta Cryst., p. B46, pp. 215-222, (1990)

"An Application of Space Group Symmetry to Expected-Value Formula in Crystallography", J. Karle, Symmetry, p. 1, pp. 67-74, (1990)

"Antimalarial Activity of New Water-Soluble Dihydroartemisinin derivatives 3,1,2 aromatic Amine Analogues", A-J. Lin, L-Q. Li, D.L. Kayman, C.F. George, J.L. Flippen-Anderson, J. Medicinal Chemistry, Sept, pp. 2610-2614, (1990)

"Unusual Behavior of 3,4:10,11-Bis(2',3'-quinolino)tricyclo-[6.3.0.2.6]undecane upon Attempted Monoprotonation with Triplet Acid", A.P. Marchand, P. Annapurna, R.W. Taylor, D.L. Simon, W.H. Watson, A. Nagl, J.L. Flippen-Anderson, R. Gilardi, C. George, Tetrahedron, p. 46, pp. 5077-5084, (1990)

"Polyazapolycyclics by Condensation of Aldehydes with Amines. 2. Formation of 2,4,6,8,10-12-Hexabenzyl-2,4,6,8,10-12-hexaazatetracyclo[5.5.0.0.5.9.0.3.11] dodecanes from Glyoxal and Benzylamines", A.T. Nielsen, R.A. Nissan, D.J. Vanderah, C.L. Coon, R.D. Gilardi, C.F. George, J.L. Flippen-Anderson, J. Org. Chem., p. 55, pp. 1459-1466, (1990)

"Relation between Calculated Amide Frequencies and Solution Structure in Ala-X Peptides", R.W. Williams, J.L. Weaver, A.H. Lowrey, Biopolymers, p. 30, pp. 599-608, (1990)

"Insertion of Bacteriorhodopsin into Polymerized Diacetylenic Phosphatidylcholines", P.L. Ahl, A. Singh, R. Price, J. Smuda, B.P. Gaber., Biochimica et Biophysica Acta, p. 1028, pp. 141-153, (1990)

"Interaction of Metallized Tubules With Electromagnetic Radiation", F. Behroozi, M. Orman, R. Reese, W. Stockton\*, J. Calvert, F. Rachford, P. Schoen, Journal of Applied Physics, p. 68(7), p. 3688, (1990)

"Heat Capacity Study of Tricritical Behavior at the Smectic A - Chiral Smectic C Liquid Crystal Transition", J. Boerico-Goates, C.W. Garland, R. Shashidhar, Phys. Rev. A, p. 41, p. 3192, (1990)

"Optical and Electron Microscopy of Electroless Metal Coatings on Lipid Tubules", J.M. Calvert, R.R. Price, P.E. Schoen, W.B. Stockton, S. Baral\*, J.H. Georger\*, P.S. Gustafsson\*, Scanning, p. 12, p. 5, p. I-60, (1990)

"Sub-Micron Lithography Using Excimer Laser and Mercury Lamp Contact Printing", J.M. Calvert, R.J. Hershey, M.C. Peckerar, M.L. Rebbert, P.E. Pehrsson, J.H. Georger\*, Scanning, p. 12, p. 5, p. I-61, (1990)

"Crystallization of Diacetylenic Phospholipid Tubules at a Liquid-Liquid-Interface", J.M. Calvert, R.R. Price, M.A. Testoff, J.D. Worley, C.E. Montague\*, A.C. Weaver\*, Scanning, p. 12, p. 5, p. I-60, (1990)

"Fabrication of Sub-Micron Features in Silicon Using 248 nm Lithography With Plasma-Hard Metal Mask", J.M. Calvert, M.C. Peckerar, J.H. Georger\*, C.S. Dulcey\*, Scanning, p. 12, p. 5, p. I-60, (1990)

"Monomolecular Film Behavior of Tetraether Lipids From a Thermoacidophilic Archaeobacteria at the Air/Water Interface", J.L. Dote, W.R. Barger, F. Behroozi, E.L. Chang, S.-L. Lo\*, C.E. Montague\*, M. Nagumo Langmuir, p. 6, pp. 1017-1023, (1990)

"Electrical Characterization of DPPE and Cadmium Stearate Films on Platinum Surfaces in Aqueous Solutions", T.L. Fare, Langmuir, p. 6, pp. 1172-1179, (1990)

"A Continuous Flow Immunoassay for Rapid and Sensitive Detection of Small Molecules", A.W. Kusterbeck, G. Wemhoff, P. Charles, D. Yeager, R. Bredehorst, C.W. Vogel, F.S. Ligler, Journal of Immunological Methods, p. 135, pp. 191-197, (1990)

"Plasma Free Field-Emission Cathodes From Tubular Microstructures Formed From Polymerizable Lecithins", R.R. Price, J.M. Calvert, J.H. Georger\*, W.B. Stockton, B. Kahn\*, P.E. Schoen, D. Kirkpatrick+, A. Ting, J.M. Schnur, Scanning, p. 12, p. 5, p. I-66, (1990)

"SEM Examination of Antifouling Paint Derived From Tubular Microstructures Containing Tetracycline", R.R. Price, M. Waynant, B.P. Gaber, Scanning, p. 12, p. 5, p. I-66, (1990)

"X-ray Studies Near the Ad - A2 Critical Point in a Binary System of Successive Homologs", S. Quentel, G. Heppke, S.K. Prasad, S. Pfeiffer, R. Shashidhar, Molecular Crystal Liquid Crystal Letters, p. 7, p. 85, (1990)

"Liposome Encapsulated Hemoglobin (LEH): An Oxygen-Carrying Fluid", R. Rabinovici, A.S. Rudolph, F.S. Ligler, T-L, Yue, G. Feuerstein, Circulatory Shock, p. 32, pp. 1-17, (1990)

"Biological Responses to Liposome Encapsulated Hemoglobin (LEH) are Improved by a PAF Antagonist", R. Rabinovici, A.S. Rudolph, T-L Yue, G. Feuerstein, Circulatory Shock, p. 31, pp. 431-445, (1990)

"Improved Biological Properties of Synthetic Distearoyl Phosphatidylcholine-Based Liposome in the Conscious Rat", R. Rabinovici, A.S. Rudolph, G. Feuerstein, Circulatory Shock, p. 30, pp. 207-219, (1990)

- "Dry-Storage of Liposome Encapsulated Hemoglobin: A Blood Substitute", A.S. Rudolph, R.O. Cliff\*  
Cryobiology, p. 27, pp. 585-590, (1990)
- "Molecular Modeling of Saccharide-Lipid Interactions", B.R. Rudolph, I. Chandrasekhar, B.P. Gaber, M. Nagumo, Chemistry and Physics of Lipids, p. 53, pp. 243-261, (1990)
- "Using Biologically-Based Self-Assembly for Non-Medical Material Applications", J.M. Schnur, Scanning, p. 12, p. 5, p. I-9, (1990)
- "An Efficient Synthesis of Phosphatidylcholines", A. Singh, J. Lipid Research, p. 31, pp. 1522-1525, (1990)
- "Component Selection for Fiber Optic Fluorometry", R.B. Thompson, M. Levine, L. Kondracki\*, Applied Spectroscopy, p. 44(1), pp. 117-122, (1990)
- "Microstructure, Order, and Fluidity of 1,2-bis(tricoso-10,12-diydol) Sn-glycero-3-phosphocholine (DC8.9PC), a Polymerizable Lipid", by ESR and NMR, R. Treanor, M.D. Pace, Biochimica et Biophysica Acta, p. 1046, pp. 1-11, (1990)
- "Numerical Predictions for a Simulated Methane Fire", K.C. Adiga, D.E. Ramaker, P.A. Tatem, F.W. Williams  
Fire and Safety Journal, p. 16, p. 6, (1990)
- "Fiber/Matrix Adhesion in Cyanate Resin Systems", J.P. Armistead, A.W. Snow, Polymer Prints p. 31, p. 537, (1990)
- "Single Crystal RuO<sub>2</sub>/Ti and RuO<sub>2</sub>/TiO<sub>2</sub> Interface: LEED, Auger and XPS Study", L. Atanasoska, R. Atanasoski, F. Pollak, W. O'Grady, Surface Science, p. 230, p. 95, (1990)
- "Elastic Effects of Polymer Coatings on Surface Acoustic Waves", D.L. Bartley, D.D. Dominguez, Anal. Chem., p. 62, p. 1649, (1990)
- "Laser-Induced Fluorescence Study of Methoxy Radical Formation from the Reactions of F(2P) Atoms with CH<sub>3</sub>OH, CD<sub>3</sub>OH, and CH<sub>3</sub>OD", D.J. Bogan, M. Kaufman, C.W. Hand, W.A. Sanders, B.E. Brauer  
J. Phys. Chem., p. 94, p. 8128, (1990)
- "Empirical Potential for Hydrocarbons for Use in Simulating the Chemical Vapor Deposition of Diamond Films", D.W. Brenner, Phys. Rev. B, p. 42, p. 9458, (1990)
- "Magnetostriction Measurements Using a Tunneling-Tip Strain Detector", R.A. Brizzolara, R.J. Colton  
J. Magnetism & Magnetic Mat., p. 88, p. 343, (1990)
- "Probing the Surface Forces of Monolayer Films with an Atomic Force Microscope", N.A. Burnham, D.D. Dominguez, R.L. Mowery, R.J. Colton, Phys. Rev. Lett., p. 64, p. 1931, (1990)
- "Microwave and Magneto-Optic Properties of Bismuth Substituted Yttrium Iron Garnet Thin Films", J. Butler, J. Kramer, R.D. Esman, A. Craig, J. Lee, T. Ryuo, J. Applied Physics, V. 67, pp. 4938-4940, May, (1990)



- "Theoretical and Experimental Investigation of BH+D2 BHD2", N.J. Caldwell, J.K. Rice, H.H. Nelson, G. Adams, M. Page, J. Chem. Phys., p. 93, p. 479, (1990)
- "Gas-Phase Reactions of Tantalum Carbide Cluster Ions with Deuterium and Small Hydrocarbons", C.J. Cassady, S.W. McElvany, J. Am. Chem. Soc., p. 112, p. 4788, (1990)
- "Oxygen Atom Detection Using Third Harmonic Generation", F.G. Celii, H.R. Thorsheim, M.A. Hanratty, J.E. Butler, Appl. Optics, p. 29, p. 3135, (1990)
- "Detection of Ground State Atomic Hydrogen in a DC Plasma using Third Harmonic Generation", F.G. Celii, H.R. Thorsheim, J.E. Butler, Appl. Phys. Lett., p. 68, p. 3814, (1990)
- "Measurement of Hydrogen Uptake by Palladium using a Quartz Crystal Microbalance", G.T. Cheek, W.E. O'Grady, J. Electroanal. Chem. & Interfacial Electrochem., p. 277, p. 341, (1990)
- "CO Formation in the Thermal Decomposition of CH3ONO at High Temperature: Kinetic modeling of the CH3O Decomposition Rate", T.K. Choudhury, Y. He, W.A. Saunders, M.C. Lin, J. Phys. Chem., p. 94, p. 2394, (1990)
- "Thermal Decomposition of t-Butyl Alcohol in Shock Waves", T.K. Choudhury, M.C. Lin, C-Y. Lin, W.A. Saunders Combust. Sci. and Tech., p. 71, 2p. 19, (1990)
- "Homogeneous Pyrolysis of Acetyl Acetone at High Temperature in Shock Waves", T.K. Choudhury, M.C. Lin  
Internat. J. Chem. Kinetics, p. 20, p. 491, (1990)
- "Multiple-pulse Methods of 1H NMR Imaging of Solids: Second-Averaging", D.G. Cory, J.B. Miller, R. Turner, A.N. Garroway, Molecular Physics, p. 70, p. 331, (1990)
- "DANTE Slice Selection for Solid State NMR Imaging", D.G. Cory, J.B. Miller, A.N. Garroway, J. Mag. Resonance, p. 90, p. 544, (1990)
- "Time-Suspension Multiple-Pulse Sequences: Applications to Solid State Imaging", D.G. Cory, J.B. Miller, A.N. Garroway, J. Mag. Resonance, p. 90, p. 205, (1990)
- "Improved Resolution of Multiple-Pulse Proton Images by Oversampling", D.G. Cory, A.N. Garroway, J.B. Miller, J. Mag. Resonance, p. 87, p. 202, (1990)
- "Measurement of Translational Displacement Probabilities", by NMR: An Indicator of Compartmentation, D.G. Cory, A.N. Garroway, Magnetic Resonance in Medicine, p. 14, p. 435, (1990)
- "The Cumulative Chemisorption of Cyanogen Chloride on a Carbon-Supported Catalyst (Whetlerite)", V.R. Deitz, J.A. Rehrmann, Carbon, p. 28, p. 363, (1990)
- "The Cumulative Chemisorption of Hydrogen Cyanide and Cyanogen on a Carbon Supported Catalyst (Whetlerite)", V.R. Deitz, J.A. Rehrmann, Carbon, p. 28, p. 387, (1990)
- "Monomolecular Film Behavior of Tetraether Lipids from a Thermoacidophilic Archaeobacterium at the Air/Water Interace", J. Dote, W. Barger, F. Behroozi, E. Chang, S. Lo, C. Montague, M. Nagumo, Langmuir, p. 6, p. 1017, (1990)
- "LCGTO-LDF Cluster Studies of D-D Interactions in Titanium and Palladium", B.I. Dunlap, D.W. Brenner, R.C. Mowrey, J.W. Mintmire, C.T. White, Phys. Rev. B, p. 41, p. 9683, (1990)

"Local-Density-Functional Total Energy Gradients in the Linear Combination of Gaussian-type Orbitals Method", B.I. Dunlap, J. Andzelm, J.W. Mintmire, Phys. Rev. A, p. 42, p. 6354, (1990)

"The Gaussian-Type Orbitals Density Functional Approach to Finite Systems", B.I. Dunlap, N. Rosch  
Adv. Quantum Chem., p. 21, p. 317, (1990)

"Symmetry and Cluster Magnetism", B.I. Dunlap, Phys. Rev. A., p. 41, p. 5691, (1990)

"Three-Center Gaussian-Type-Orbital Integral Evaluation Using Solid Spherical Harmonics", B.I. Dunlap  
Phys. Rev. A, p. 42, p. 1127, (1990)

"Analysis of Transfer Films Formed on Steel and Co-WC during Sliding against MoS<sub>2</sub>-Coated Steel in Argon", S. Fayeulle, P.D. Ehni, I.L. Singer, Surface and Coatings Technology, p. 41, p. 93, (1990)

"OH and CH Profiles in a 10 Torr Methane/Oxygen Flame: Experiment and Flame Modeling", J.W. Fleming, K.A. Burton, H.D. Ladouceur, Chem. Phys. Lett., p. 175, p. 395, (1990)

"Synthetic Sequence Effects in Polyurethane - Poly(n-Butyl Methacrylate) Mixtures: Grafting and Mechanical Properties", R.B. Fox, J.P. Armistead, C.M. Roland, D.J. Moonay, J. Applied Polymer Sci., p. 1, p. 1281, (1990)

"Structural and Elastic Property Changes in Ag/Co Superlattices Induced by High-Energy Ion Irradiation", E. Fullerton, I.K. Schuller, R. Bhadra, M. Grimsditch, S.M. Hues, Matl. Sci. and Eng., p. A126, p. 19, (1990)

"BH Reaction Kinetics Studied with a High Temperature Reactor", N.L. Garland, C.T. Stanton, J.W. Fleming, A.P. Baronavski, H.H. Nelson, J. Phys. Chem., p. 94, p. 4952, (1990)

"Multiple-Quantum NMR in a Mixture of Liquid Crystals: Differential Coherence Development", W.V. Gerasimowicz, A.N. Garroway, J.B. Miller, J. Am. Chem. Soc., p. 112, p. 3726, (1990)

"The Role of Selective Sorption in Chemresistor Sensors for Organophosphorous Detection", J.W. Grate, M. Klusty, W.R. Barger, A. Snow, Anal. Chem., p. 62, p. 1927, (1990)

"Effects of Fluorine Content and Structure Upon Glass Transition Temperatures of Fluoroepoxy Resins", J.R. Griffith, A.E. Mera, Polymer Preprints 31, pp. 367-8, (1990)

"Comment on Laser Induced Fluorescence of HCCO (DCCO) Radical Formed in O+C<sub>2</sub>H<sub>2</sub>(C<sub>2</sub>D<sub>2</sub>) Reaction", M.A. Hanratty, H.H. Nelson, J. Chem. Phys., p. 92, p. 814, (1990)

"A Cell for X-ray Absorption Studies of the Emerged Electrochemical Interphase", G.J. Hansen, W.E. O'Grady  
Rev. Sci. Instruments, p. 61, p. 2127, (1990)

"Insoluble Sediment Formation in Middle Distillate Diesel Fuel: Further Evidence Concerning the Role of In Situ Fuel Acidity", D.R. Hardy, M.A. Wechter, Fuel, p. 69, p. 720, (1990)

"Photodissociation of Adsorbed Trimethylindium", J. Horwitz, E. Villa, D.S.Y. Hsu, J. Phys. Chem., p. 94, p. 7214, (1990)

"Mass Spectrometric Characterization of Performance of a Low-Temperature Oxidation Catalyst", C.C. Hsu, C.S. Dulcey, J.S. Horwitz, M.C. Lin, J. Molecular Catalysis, p. 60, p. 389, (1990)

"Laser Probing of Nascent Gaseous Product Species Formed in Chemical Reactions on Surfaces", D.S.Y. Hsu  
Opt. Eng., p. 29, p. 1494, (1990)

"Effect of Hydrogen Substitution of the Mass Spectrometry and Size Exclusion Chromatography of Perfluorinated Polyether Fluids as Determined by Time-of-Flight Secondary Ion Mass Spectrometry", S.M. Hues, J.R. Wyatt, R.J. Colton, B.H. Black, Anal. Chem., p. 62, p. 1074, (1990)

"Secondary Ion Mass Spectrometry - A Practical Handbook for Depth Profiling and Bulk Impurity Analysis", S.M. Hues, R.J. Colton, Applied Spectroscopy 44, p. 501, (1990)

"The Application of Energetic Ion Beams to Thin Metallic Films", S.M. Hues, Matl. Sci. and Eng., p. B6, p. 205, (1990)

"On the Electrochemical Etching of Tips for Scanning Tunneling Microscopy", J.P. Ibe, P.P. Bey Jr., S.L. Brandow, R.A. Brizzolara, N.A. Burnham, D.P. DiLella, K.P. Lee, C.R.K. Marrian, R.J. Colton  
J. Vac. Sci. & Technol., p. A8, p. 3570, (1990)

"Oxide Acid-Base Reactions in Ceramic Corrosion", R.L. Jones, High Temperature Science, p. 27, p. 369, (1990)

"Aerosol Agglomeration: Stochastic vs. Deterministic Solutions", C.R. Kaplan, J.W. Gentry, AIChE Journal, p. 36, p. 289, (1990)

"Phthalonitrile Resin as a Carbon Source", T.M. Keller, Polymer Comm., p. 31, p. 229, (1990)

"High Temperature Fluorine-Containing Phthalonitrile Resins", T.M. Keller, Polymer Preprints p. 31, p. 356, (1990)

"Symptomatology during Hypoxic Exposure to Flame-Retardant Chamber Atmospheres", D.R. Knight, A. Cymerman, J.A. Devine, R.L. Burse, C.S. Fulco, P.B. Rock, D.V. Tappan, A.A. Messier, H.W. Carhart, Undersea Biomedical Research, p. 17, (1990)

"Atomistic Mechanisms and Dynamics of Adhesion, Nanoindentation, and Fracture Landman", W.D. Luedtke, N.A. Burnham, R.J. Colton Science, 248, 454, (1990)

"Structure and Properties of N-Substituted Polyisindoles", Y.S. Lee, H.S-W. Hu, O-K. Kim Molec. Crystals and Liq. Crystals, 190, 9, (1990)

"A Shock Tube Study of the CH<sub>2</sub>O + NO<sub>2</sub> Reaction at High Temperature", C-Y. Lin, H-T. Wang, M.C. Lin, C.F. Melius, Internat'l. J. Chem. Kinetics, 22, 455, (1990)

"Fire-Inhibiting Behavior of High Molecular Weight Polyisobutylene in JP-5 Jet Fuel", R. Little, S. Pande, J. Romans, Fire Safety Journal, 16, 119, (1990)

- "Production and Fragmentation of Tantalum Carbide Cluster Ions", S.W. McElvany, C.J. Cassady  
J. Phys. Chem., 94, 2057, (1990)
- "Production, Dissociation and Reactivity of Carbon Cluster Anions", S.W. McElvany, Int. J. Mass Spectrom. and Ion Proc., 102, 81, (1990)
- "Detection of the Presence and Location of Residual Hydrogen in Perfluorinated Polyalkylether Fluids Using Polarization Transfer.  $^{13}\text{C}$  Nuclear Magnetic Resonance Spectroscopy", K. McGrath, J. Fluorine Chem., 49, 171, (1990)
- "Linear Fluoroaliphatic Polyesters From Long-Chain Fluorinated Diols", A.E. Mera, J.R. Griffith, J.P. Armistead, Polymer Preprints 31, 318, (1990)
- "Synthesis of Reactive Fluoroaliphatic Diamines", A.E. Mera, J.R. Griffith, K. Baum, J. Fluorine Chem., 49, 313, (1990)
- "Nuclear Magnetic Resonance Study of Polyisoprene-Poly(vinylethylene) Miscible Blends", J.B. Miller, K.J. McGrath, C.M. Roland, C.A. Trask, A.N. Garroway, Macromolecules, 23, 4543, (1990)
- "First-Principles Studies of Polysilane Model Systems", J.W. Mintmire, J.V. Ortiz, Polym. Prepr. 31, 234, (1990)
- "Geometry Optimization of Molecules within an LCGTO Local-Density Functional Approach", J.W. Mintmire  
Int. J. Quant. Chem., 24, 851, (1990)
- "Model Studies of Composition-Modulated Cu-N: Superlattices", J.W. Mintmire, Mat'ls Sci. & Eng., A126, 19, (1990)
- "Ab Initio Multireference Configuration Interaction Study of  $\text{CH}_2\text{NNO}_2$ : HONO Elimination vs. NN Bond Fragmentation", R.C. Mowrey, M. Page, G.F. Adams, B.H. Lengsfeld III, J. Chem. Phys., 93, 1857, (1990)
- "Proximal Probes: Techniques for Measuring at the Nanometer Scale", J.S. Murday, R.J. Colton, Mats. Sci. and Eng., B6, 77, (1990)
- "Temperature Dependence of the Collisional Quenching of  $\text{NH}(a_1)$ ,  $\text{N}_2$ ,  $\text{O}_2$ ,  $\text{CO}$  and  $\text{Xe}$ ", H.H. Nelson, J.R. McDonald, M.H. Alexander, J. Phys. Chem., 94, 3291, (1990)
- "Energy Partitioning in the 266 nm Dissociation of  $\text{HN}_3$  and Relative Transition Probabilities in the  $\text{NH}(c_1a_1)$  System", H.H. Nelson, J.R. McDonald, J. Chem. Phys., 93, 8777, (1990)
- "Rotational Energy Accommodation and Apparent Desorption Energy of OH Formed in the Catalytic Reaction of  $\text{NO}_2$  and  $\text{H}_2$  over  $\text{Pt}(111)$ : Effect of Surface Oxygen Coverage", L.V. Novakoski, D.S.Y. Hsu, J. Chem. Phys., 92, 1999, (1990)
- "Ground State and Vertical Ionization Energies versus Si-Si-Si and CCC Bond Angles in  $\text{Si}_3\text{H}_8$  and  $\text{C}_2\text{H}_8$ ", J.V. Ortiz, J.W. Mintmire, Polym. Prepr. 31, 284, (1990)
- "A Practical Evaluation of Published Cetane Indices", S.G. Pande, D.R. Hardy, Fuel, 69, 437, (1990)

- "O'Grady", D.A. Corrigan, J. McBreen, R.W. Hoffman, J. Phys. Chem., 94, 21, (1990)
- "In Situ X-Ray Absorption Spectroscopic Studies of Nickel Oxide Electrodes", K. Pandya, R.W. Hoffman, J. McBreen, W.E. O'Grady, J. Electrochem. Soc., 137, 383, (1990)
- "Reactions of the Carbene Ions  $CnN^+$  with Labelled Methane: Mechanistic Interpretation", D.C. Parent  
J. Am. Chem. Soc., 112, 5966, (1990)
- "On The Exotherm Of Polyacrylonitrile: Pyrolysis Of The Homopolymer Under Inert Conditions", L.H. Peebles Jr., P. Peysen, A.W. Snow, Carbon, 28, 707, (1990)
- "The Rotational Tunneling Spectrum of the  $H_2S$   $CO_2$  van der Waals Complex", J.K. Rice, L. Coudert, K. Matsumura, R.D. Suenram, F.J. Lovas, W. Stahl, D.J. Pauley, S.G. Kukolich, J. Chem. Phys., 92, 6408, (1990)
- "Non-Statistical Behavior in the Rotational Energy Distribution of CO from the Hot Hydrogen Atom Reaction:  $H+CO_2 \rightarrow OH + CO$ ", J.K. Rice, Y.C. Chung, A.P. Baronavski, Chem. Phys. Lett., 167, 151, (1990)
- "Evidence for a Sequential Mechanism in the Production of BH from the 193nm Photodissociation of  $BH_3CO$ ", J.K. Rice, C.H. Douglass, H.H. Nelson, Chem. Phys., 143, 109, (1990)
- "Interaggregate Interaction in Filled Rubber", C.M. Roland, G.F. Lee, Rubber Chem. Tech., 63, 554, (1990)
- "Orientation Effects in Rubber Double Networks", C.M. Roland, M.L. Warzel, Rubber Chem. and Technology, 63, 285, (1990)
- "Dynamic Mechanical Behavior of Filled Rubber at Small Strains", C.M. Roland, J. Rheology, 34, 25, (1990)
- "Morphological Differences Between Hydrogen-Loaded and Deuterium-Loaded Palladium as Observed by Scanning Electron Microscopy", D.R. Rolison, P.P. Trzaskoma, J. Electroanal. Chem., 287, 375, (1990)
- "Zeolite-Modified Electrodes and Electrode-Modified Zeolites", D.R. Rolison, Chem. Rev., 90, 867, (1990)
- "Mass Spectrometric Analysis of Anatoxin-a", M.M. Ross, D.A. Kidwell, J.H. Callahan, J. Anal. Toxicol., 13, 317, (1990)
- "Thermal Desorption/Tandem Mass Spectrometry of Whetlerite Adsorbates", M.M. Ross, V.R. Deitz  
Carbon, 28, 229, (1990)
- "The Physical and Chemical Action of Fire Suppressants", R.S. Sheinson, J.E. Penner-Hahn, D. Indritz  
Fire Safety Journal, 15, 437, (1990)
- "Controlled Shrinkage Polymers: Characterization of Epoxy Resins Cured with Spirobis lactones", A.M. Sikes, R.F. Brady, J. Polymer Sci.: Part A: Polymer Chemistry, 28, 2533, (1990)

- "Hertzian Stress Contribution to Low Friction Behavior of Thin MoS<sub>2</sub> Coatings", J.L. Singer, R.N. Bolster, J. Wegand, S. Fayeulle, B.C. Stupp, *Appl. Phys. Lett.*, 57, 995, (1990)
- "Poly(ethylene terephthalate) Crystallization as a Method for Microlithography", M.F. Sonnenschein, A.M. Kotliar, C.M. Roland, *Polymer Eng. and Sci.*, 30, 1165, (1990)
- "Absorption and Fluorescence Spectra of PET Dimers", M. Sonnenschein, C.M. Roland, *Polymer*, 31, 2023, (1990)
- "High Resolution Ablation of Amorphous Polymers Using CO<sub>2</sub> Laser Irradiation", M.F. Sonnenschein, C.M. Roland, *Appl. Phys. Lett.*, 57, 425, (1990)
- "Studies of Chromium Carbide Electrodeposition in Molten Fluorides", K.H. Stern, D.R. Rolison, *J. Electrochem. Soc.*, 137, 178, (1990)
- "Complex Route to Chaos in Velocity-Driven Atoms", P.X. Tran, D.W. Brenner, C.T. White, *Phys. Rev. Lett.*, 65, 3219, (1990)
- "Dynamics of Solitary Waves Induced by Shock Impulses in a Linear Atomic Chain", P.X. Tran, D.W. Brenner, C.T. White, *Int. J. Quant. Chem.*, 24, 549, (1990)
- "Microstructure, Order, and Fluidity of 1,2-bis(tricoso-10,12-diynol) Sn-glycero-3-phosphocholine (DC8,9PC), a Polymerizable Lipid", By ESR and NMR, R. Treanor, M.D.Pace, *Biochimica et Biophysica Acta*, 1046, 1, (1990)
- "Principal Component Analysis with Integral Auger Electron Spectroscopy Spectra", N.H. Turner, J.M. Wandass, F.L. Hutson, *J. Vac. Sci. & Technol.*, A8, 4033, (1990)
- "Determination of Peak Positions and Areas from Wide-scan XPS Spectra", N.H. Turner, A.M. Single  
Surface and Interface Analysis, 15, 215, (1990)
- "Photochemistry of Adsorbed Phenyl Iodide: Desorption and Photofragmentation Dynamics by EI/REMPI- TOF Measurement", E. Villa, J.A. Dagata, M.C. Lin, *J. Chem. Phys.*, 92, 1407, (1990)
- "A Processable Prepolymer for the Preparation of a Stable Conductive Polymer", T.R. Walton, *J. Appl. Polymer Sci.*, 37, 1921, (1990)
- "Photodissociation Dynamics of BH<sub>3</sub>CO at 193 nm", B.R. Weiner, L. Pasternack, H.H. Nelson, K.R. Prather, R.N. Rosenfeld, *J. Phys. Chem.*, 94, 4138, (1990)
- "Limits of Chemical Effects on Cold Fusion", C.T. White, B.I. Dunlap, D.W. Brenner, R.C. Mowrey, J.W. Mintmire, *J. Fusion Energy*, 9, 363, (1990)
- "Kinetics of CO and H Atom Production from the Decomposition of HNCO in Shock Waves", C.H. Wu, H-T. Wang, M.C. Lin, R.A. Fifer, *J. Phys. Chem.*, 94, 3344, (1990)
- "Bainite Viewed Three Different Ways", H.I. Aaronson, W.T. Reynolds Jr., G.J. Shiflet, G. Spanos  
*Metallurgical Transactions A*, Vol. 21A, pp 1343-1380, (1990)

"Nanoindentation Study of the Mechanical Properties of Copper-Nickel Multilayered Thin Films", R.C. Cammarata, T.E. Schlesinger, C. Kim, S.B. Qadri, A.S. Edelstein, Appl. Phys. Lett., Vol. 56, No.19, pp 1862-1864, (1990)

"Chaos in Magnetostatic Modes in a Yttrium Iron Garnet Film Between 2 and 4 GHz", T.L. Carroll, L.M. Pecora, F.J. Rachford, Journal of Applied Physics 67 (9), p 5630, (1990)

"Magnetotransport Study of Fe-Cr-Fe Sandwiches Grown on ZnSe(100)", A. Chaiken, G.A. Prinz, J.J. Krebs  
J. Appl. Phys. 67 (9), p 4892, (1990)

"Magnetotransport Study of Fe-Cr-Fe Sandwiches Grown on ZnSe(100)", A. Chaiken, G.A. Prinz, J.J. Krebs  
J. Appl. Phys., 67, 9, p. 4892, (1990)

"Alternative Approach to Nanocomposite Synthesis by Sputtering", G.M. Chow, R.L. Holtz, A. Pattnaik, A.S. Edelstein, T.E. Schlesinger, R.C. Cammarata, Appl. Phys. Lett., Vol. 56, No. 19, 7, pp 1853-1855, (1990)

"Microstructure, Crystallization, and Coercivity of Rare Earth-Iron-Boron Amorphous Alloy Ribbons", B.N. Das, P.D'Antonio, N.C. Koon, Metallurgical Transactions A, Vol. 21A, p 2805, (1990)

"Integrity Analysis of a T-Frame Stiffened Panel with a Weld Defect", V.G. DeGiorgi, P. Matic, J. Judy, M.I. Jolles, Mech. Struct. & Mach., 18 (3), 293-311, (1990)

"Numerical Prediction of Welded Joint Performance-Relative Criticality of Weld Defect and Remote Deformation", V. Gensheimer DeGiorgi, P. Matic, M.I. Jolles, Journal of Pressure Vessel Technology, Vol. 112, pp 175-181, (1990)

"Effect of First Reflections in Dynamic Tear Test", V. Gensheimer DeGiorgi, L.M. Brock, Journal of Engineering Mechanics, Vol. 116, No. 6, pp 1276-1289, (1990)

"A Computational Investigation of Local Material Strength and Toughness on Crack Growth", V. Gensheimer DeGiorgi, P. Matic, Engineering Fracture Mechanics Vol. 37, No. 5, pp 1039-1058, (1990)

"Ultrasonic Texture and Stress Measurements in Anisotropic Polycrystalline Aggregates", P.P. Delsanto, R.B. Mignogna, A.V. Clark Jr., J. Acoust. Soc. Am. 87 (1), p 215, (1990)

"Magnetic Coupling in High Moment fcc Fe/Ni Multilayers", A.S. Edelstein, C. Kim, S.B. Qadri, K.H. Kim, V. Browning, H.Y. Yu, B. Maruyama, R.K. Everett, Solid State Communications, Vol. 76, No. 12, pp. 1379-1382, (1990)

"High Field Specific Heat and Susceptibility Measurements on Single Crystal CeCu6", A.S. Edelstein, B.N. Das, W.W. Fuller, B. Andraka, G.R. Stewart, Physica B 163, 504-506, (1990)

"Letter to the Editor. 'Pathological Science': Erroneous Epilogue?", W.L. Faust, D.J. Michel, Physics Today, p 13, (1990)

"A Short Note on the Microstructure of TiAl/Ti(3)Al", C.R. Feng, D.J. Michel, C.R. Crowe, Scripta Metallurgica, Vol. 24, pp 239-240, (1990)

- "Antiphase Domains and {011} Twins in TiAl", C.R. Feng, D.J. Michel, C.R. Crowe, Philosophical Magazine Letters, Vol. 61, No. 3, 95-100, (1990)
- "Martensites in Rolled XD(TM) Titanium Aluminide", C.R. Feng, D.J. Michel, C.R. Crowe, Scripta Metallurgica et Materialia Vol. 24, pp 1913-1917, (1990)
- "Microstructures of XD(TM) Titanium Aluminide at Elevated Temperatures", C.R. Feng, D.J. Michel, C.R. Crowe, Scripta Metallurgica, Vol. 24, pp. 1297-1301, (1990)
- "Dislocation Structures in Extruded FeAl", C.R. Feng, K. Sadananda, Scripta Metallurgica et Materialia Vol. 24, pp 2107-2112, (1990)
- "Effect of Magnetic Field on the d.c. Transport Critical Current Density in Grain Oriented Y-Ba-Cu-O", T.L. Francavilla, V. Selvamanickam, K. Salama, D.H. Liebenberg, Cryogenics, Vol. 30, p 606, (1990)
- "Effect of Heating and Rapidly Quenching NbSe<sub>3</sub> Crystals", W.W. Fuller, T.M. Tritt, H.A. Hoff, A. Zettl  
Physical Review B, Vol. 41, No. 3, 15-II, pp. 1671-1672, (1990)
- "Fatigue Crack Propagation in an HSLA Steel(MF-80) in Air and in Salt Water", S.J. Gill, T.W. Crooker  
Marine Technology, Vol. 27, No. 4, pp 221-224, (1990)
- "Embedded-Atom-Method Study of Coherency and Elastic Moduli of Pd-Cu Multilayers", C.M. Gilmore, V. Provenzano, Physical Review B, Vol. 42, No. 11, pp 6899-6905, (1990)
- "Estimation of the Yield Strength of Metals from Crystal Defect Energies", D.P. Harvey II, M.I. Jolles  
Metallurgical Transactions A, Vol. 21A, p 1719, (1990)
- "Enhanced Magnetic Anisotropy at the Percolation Threshold of Fe-SiO<sub>2</sub> Composite Thin Films", R.L. Holtz, P. Lubitz, A.S. Edelstein, Appl. Phys. Lett. 56 (10), pp 943-945, (1990)
- "The Decomposition of the T<sub>2</sub>(Al<sub>6</sub>CuLi<sub>3</sub>) Phase During Conventional Ion-Beam Thinning", P.R. Howell, D.J. Michel, J.R. Reed, Scripta Metallurgica et Materialia Vol. 24, pp 1033-1038, (1990)
- "Identification of the Mn Structure in Mn/Ag(001) Superlattices", Y.U. Idzerda, B.T. Jonker, W.T. Elam, G.A. Prinz, J. Appl. Phys. 67 (9), p 5385, (1990)
- "Structure Determination of Metastable Cobalt Films Deposited on GaAs", Y.U. Idzerda, B.T. Jonker, W.T. Elam, G.A. Prinz, J. Vac. Sci. Technol. A 8 (3), p 1572, (1990)
- "Fracture Toughness of Graded Metal-Particulate/Brittle-Matrix Composites", T.L. Jessen, D. Lewis  
J. Am. Ceram. Soc., 73, 5, pp. 1405-1408, (1990)
- "Fracture Toughness of Graded Metal-Particulate/Brittle-Matrix Composites", T.L. Jessen, D. Lewis III, J. Am. Ceram. Soc., 73 (5) 1405-1408, (1990)
- "Tensile Instability and Deformation Behavior of Rapidly Heated Metals in a Constant-Load Environment", H.N. Jones, K.M. Wu, International Journal of Thermophysics, Vol. 11, No. 4, pp 675-691, (1990)



"A Compact Flange-Mounted Electron Beam Source", B.T. Jonker, J. Vac. Sci. Technol. A 8 (5), p 3883, (1990)

"On the Determination of the Piezoelectric Shear Coefficient,  $d_{15}$ , in a PZT Ceramic", M. Kahn, R.P. Ingel, D. Lewis III, Ferroelectrics, Vol. 102, pp 225-234, (1990)

"Deformation Processed Composite Wires from Gas-Atomized Cu-Cr-Ag Powder", J.C. Malzahn Kampe, K.P. Cooper, J.D. Ayers, Scripta Metallurgica et Materialia Vol. 24, pp 1783-1788, (1990)

"Magnetic-Resonance Exchange Scattering at the Iron L(II) and L(III) Edges", C. Kao, J.B. Hastings, E.D. Johnson, D.P. Siddons, G.C. Smith, G.A. Prinz, Physical Review Letters, Vol. 65, No. 3, p 373, (1990)

"Ion-beam-sputtered Cu/Ni and Fe/Ni Multilayers", C. Kim, S.B. Qadri, P. Lubitz, T.E. Schlesinger, R.C. Cammarata, A.S. Edelstein, Materials Science and Engineering, A126, 25-28, (1990)

"Synthesis and Structure of Ion-Beam Sputtered Multilayer Fe/Ni Films", C. Kim, S.B. Qadri, H.Y. Yu, K.H. Kim, B. Maruyama, A.S. Edelstein, J. Vac. Sci. Technol. A 8 (3), pp 1407-1410, (1990)

"Synthesis and Structural Properties of Ion-Beam Sputtered Cu/Ni Multilayers", C. Kim, S.B. Qadri, M. Twigg, A.S. Edelstein, J. Vac. Sci. Technol. A 8 (4), p 3466, (1990)

"Observation of Magnetic Resonance Modes of Fe Layers Coupled Via Intervening Cr (Invited)", J.J. Krebs, P. Lubitz, A. Chaiken, G.A. Prinz, J. Appl. Phys. 67 (9), p 5920, (1990)

"Major Normal and Superconducting Parameters of High Tc Oxides", V.Z. Kresin, S.A. Wolf, Physical Review B, Vol. 41, No. 7, p 4278, (1990)

"Multigap Structure in the Cuprates", V.Z. Kresin, S.A. Wolf, Physica C, Vol. 169, 476-484, (1990)

"Ce-Valence Variations Within the Anderson Model Framework", G. Liang, J. Chen, Y. Jeon, M. Croft, A.S. Edelstein, Physica B 163, 355-357, (1990)

"Magnetorefectivity Study of Excitons in ZnCoSe", X. Liu, A. Petrou, B.T. Jonker, J.J. Krebs, G.A. Prinz, J. Warnock, J. Appl. Phys. 67 (9), p 4796, (1990)

"On the Interactions of Dislocation with Planar Free Surfaces", N.P. Louat, K. Sadananda, J. Appl. Phys. 68 (2), pp 526-530, (1990)

"Structural and Magnetic Studies on  $RInPt_4$  ( $R=La-Tm$ ) Compounds", S.K. Malik, R. Vijayaraghavan, D.T. Adroja, B.D. Padalia, A.S. Edelstein, Journal of Magnetism and Magnetic Materials, 92, pp. 80-86, (1990)

"Catalytic Carbide Formation at Aluminum-Carbon Interfaces", B. Maruyama, F.S. Ohuchi, L. Rabenberg, Journal of Materials Science Letters, 9, 864-866, (1990)

"The Anodic Behavior of Ion Beam Mixed Surface Alloys", E. McCafferty, P.M. Natishan, G.K. Hubler, Corrosion Science, Vol. 30, No. 2/3, pp. 209-221, (1990)

- "A Competitive Adsorption Model for the Inhibition of Crevice Corrosion and Pitting", E. McCafferty  
J. Electrochem. Soc. 137, No. 12, pp 3731-3737, (1990)
- "Laser Beam Welding: Thermal Profiles and HAZ Hardness", E.A. Metzbower, Welding Journal, Vol. 69, No. 7, 272-s - 278-s, (1990)
- "On the Effect of Low-Dose Ion Beam Thinning on the Stability of the T<sub>2</sub>(Al<sub>6</sub>CuLi<sub>3</sub>) Phase in Dilute Al-Li-Cu Alloys", D.J. Michel, P.R. Howell, J.R. Reed, Scripta Metallurgica et Materialia Vol. 24, pp 1039-1044, (1990)
- "A Soft X-Ray Emission Spectroscopy Investigation of Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>8</sub>", D.R. Mueller, D.E. Ederer, J.-E. Rubensson, R. Shuker, J. Wallace, C.H-Zhang, J. Jai, T.A. Callcott, Qing-Yi Dong, L.E. Toth, R. Rayne, M. Osofsky, Physica Scripta Vol. 41, 979-983, (1990)
- "Viscoplastic Constitutive Modeling of High Strain-Rate Deformation, Material Damage, and Spall Fracture", J.A. Nemes, J. Eftis, P.W. Randles, , Journal of Applied Mechanics, Vol. 112, p 282, (1990)
- "Study of Annealing Twins in FCC Metals and Alloys", C.S. Pande, M.A. Imam, B.B. Rath, Metallurgical Transactions A, Vol. 21A, pp 2891-2896, (1990)
- "On a Stochastic Theory of Grain Growth-II", C.S. Pande, E. Dantsker, Acta metall. mater. Vol. 38, No. 6, pp 945-951, (1990)
- "Room-Temperature Fatigue Crack Propagation in Ti-47Al/TiB<sub>2</sub> Composites", P.S. Pao, A. Pattnaik, S.J. Gill, D.J. Michel, C.R. Feng, C.R. Crowe, Scripta Metallurgica et Materialia, Vol. 24, pp 1895-1900, (1990)
- "Synchronization in Chaotic Systems", L.M. Pecora, T.L. Carroll, Physical Review Letters, Vol. 64, No. 8, pp 821-824, (1990)
- "Hybrid Ferromagnetic-Semiconductor Structures", G.A. Prinz, Science, 250, pp. 1092-1097, (1990)
- "On the Validation of a Superstrength Concept", V. Provenzano, N.P. Louat, M.A. Imam, K. Sadananda, Scripta Metallurgica et Materialia Vol. 24, pp 2065-2070, (1990)
- "Oxygen Ion Beam Assisted Thin Film Deposition", R. Puckett, L. Stelmack, S. Michel, M.J. O'Connell, Paul Natishan, Surface and Coatings Technology, 41, 259-267, (1990)
- "e(-)-beam Deposition of Tetragonal ZrO<sub>2</sub> Films Stabilized with Alumina and Scandia", S.B. Qadri, E.F. Skelton, M. Harford, P. Lubitz, L. Aprigliano, J. Vac. Sci. Technol. A8 (3), p 2344, (1990)
- "First-Order Magnetic-Field-Induced Phase Transition in Epitaxial Iron Films Studied by Magnetoresistance", K.T. Riggs, E.D. Dahlberg, G.A. Prinz, Physical Review B, Vol. 41, No. 10, p 7088, (1990)
- "Morphological Differences Between Hydrogen-Loaded and Deuterium-Loaded Palladium as Observed by Scanning Electron Microscopy", D.R. Rolison, P.P. Trzaskoma, J. Electroanal. Chem. 287, 375-383, (1990)

"Fe Mossbauer Effect in  $Y_xPr_{1-x}Ba_2(Cu_{0.98}Fe_{0.02})_3O_7$ ", M. Rubinstein, L.J. Swartzendruber, L.H. Bennett, J.J. Ritter, U. Atzmony, J. Appl. Phys. 67 (9), p 5029, (1990)

"Fatigue and Creep Crack Growth in Oxide Dispersion Strengthened INCONEL MA-754", P. Shahinian, K. Sadananda, Metallurgical Transactions A, Vol. 21A, pp 177-187, (1990)

"Chaotic Acoustoelectric Oscillations in InSb in a Magnetic Field", C.W. Skorupka, L.M. Pecora, T.L. Carroll, T.M. Tritt, Physical Review B, Vol. 42, No. 14, p 9252, (1990)

"Diffuse Elastic Scattering of Atoms from Surface Steps", C.W. Skorupka, J.R. Manson, Physical Review B, Vol. 41, No. 12, p 8156, (1990)

"Inelastic Scattering from Einstein Modes of Surface Defects", C.W. Skorupka, J.R. Manson, Physical Review B, Vol. 41, No. 14, p 9783, (1990)

"Fatigue Crack Propagation in a Rapidly Solidified Al-12.4Fe-1.2V-2.3Si Alloy", H.H. Smith, D.J. Michel  
Metallurgical Transactions A, Vol. 21A, p 499, (1990)

"Magnetic Phase Diagrams for High Transition Temperature Superconductors", R.J. Soulen Jr., S.A. Wolf  
Physica C 166, 95-99, (1990)

"Preparation of Orthombic  $Ba_2YCu_3O_7$  Powder by Single Step Calcining", J.R. Spann, I.K. Lloyd, M. Kahn, M. Chase, J. Am. Ceram. Soc., 73 (2) 435-38, (1990)

"Influence of Carbon Concentration and Reaction Temperature Upon Bainite Morphology in Fe-C-2 Pct Mn Alloys", G. Spanos, H.S. Fang, D.S. Sarma, H.I. Aaronson, Metallurgical Transactions A, Vol. 21A, pp 1391-1411, (1990)

"A Mechanism for the Formation of Lower Bainite", G. Spanos, H.S. Fang, H.I. Aaronson, Metallurgical Transactions A, Vol. 21A, pp 1381-1390, (1990)

"The Interfacial Structure and Habit Plane of Proeutectoid Cementite Plates", G. Spanos, H.I. Aaronson  
Acta Metall. Mater. Vol. 38, No. 12, pp 2721-2732, (1990)

"Fatigue Processes in Metals-Role of Aqueous Environments", T.S. Sudarshan, T.S. Srivatsan, D.P. Harvey II  
Engineering Fracture Mechanics Vol. 36, No. 6, pp 827-852, (1990)

"Charge-Density-Wave Narrow-Band Noise in  $NbSe_3$  at  $T < 4K$ ", T.M. Tritt, D.J. Gillespie, A.C. Ehrlich  
Physical Review B, Vol. 41, No. 11, p 7948, (1990)

"Pit Morphology of Aluminum Alloy and Silicon Carbide/Aluminum Alloy Metal Matrix Composites", P.P. Trzaskoma, Corrosion, pp 402-409, (1990)

"Interface Migration During Recrystallization: The Role of Recovery and Stored Energy Gradients", R.A. Vandermeer, B.B. Rath, Metallurgical Transactions A, Vol. 21A, pp 1143-1149, (1990)

"Modeling Diffusional Growth During Austenite Decomposition to Ferrite in Polycrystalline Fe-C Alloys", R.A. Vandermeer, Acta Metall. Mater. Vol. 38, No. 12, pp 2461-2470, (1990)

- "Mossbauer Study of  $^{57}\text{Fe}$  Single-Crystal Films Grown on (110) GaAs by MBE", F.A. Volkening, B.T. Jonker, G.A. Prinz, N.C. Koon, Journal of Applied Physics 67 (9), p 5646, (1990)
- "Visible and Infrared Detection Using Superconductors", S.A. Wolf, U. Strom, J.C. Culbertson, Solid State Technology, p 187, (1990)
- "A Hybrid Numerical/Experimental Technique for Determining the Heat Dissipated During Low Cycle Fatigue", A.K. Wong, G.C. Kirby, Engineering Fracture Mechanics Vol. 37, No. 3, pp 493-504, (1990)
- "Strength and Toughness of Jade and Related Natural Fibrous Materials", C.C. Wu, K.R. McKinney, R.W. Rice, Journal of Materials Science 25, 2170-2174, (1990)
- "Structural Studies and Magnetic Properties of Fe/Ag Superlattices", J.Q. Xiao, A. Gavrin, G. Xiao, J.R. Childress, W.A. Bryden, C.L. Chien, A.S. Edelstein, J. Appl. Phys. 67 (9), p 5388, (1990)
- "Ripple-Load Cracking in a Titanium Alloy", G.R. Yoder, P.S. Pao, R.A. Bayles", Scripta Metallurgica et Materialia Vol. 24, pp 2285-2289, (1990)
- "The Effect of Substrate on the Elastic Properties of Films Determined by the Indentation Test-Axisymmetric Boussinesq Problem", H.Y. Yu, S.C. Sanday, B.B. Rath, J. Mech. Phys. Solids Vol. 38, No. 6, pp. 745-764, (1990)
- "Buckle Formation in Vacuum-Deposited Thin Films", H.Y. Yu, C. Kim, S.C. Sanday, Thin Solid Films, 196, (1990)
- "Axisymmetric Inclusion in a Half Space", H.Y. Yu, S.C. Sanday, Journal of Applied Mechanics, Vol. 112, pp 74-77, (1990)
- "Plating on Anodized Aluminum-II: The Effect of the Metal, the Anion, and the Aluminum Alloy", A. Zagieli, P. Natishan, E. Gileadi, Electrochimica Acta, Vol. 35, No. 6, pp. 1019-1030, (1990)
- "Diode Pumped Single Mode Fluorozirconate Fiber Laser from the  $4I_{11/2} \rightarrow 4I_{13/2}$  Transition in Erbium", R. Allen, L. Esterowitz, Appl. Phys. Letts., Vol. 56, No. 17, (1990)
- "Stimulated Emission in Atomic Hydrogen at 656 nm", R. Auyeung, D. Cooper, S. Kim, B. Feldman, Optics Communications, 79, 207, (1990)
- "Approaches to Accurate Characterization of High Purity Metal Fluoride and Fluoride Glasses", E. Beary, P. Paulsen, T. Rains, K. Ewing, I. Aggarwal, Journal of Crystalline Growth, Vol. 106, 51-60, (1990)
- "Interferometric Fiber Displacement/Strain Sensor Based on Source Coherence Synthesis", T.A. Berkoff, A.D. Kersey, Electronics Letters, V. 26, p. 452, (1990)
- "3 $\mu\text{m}$  Laser Performance of Ho:YAlO<sub>3</sub> and Nd:Ho:YAlO<sub>3</sub>", S. Bowman, W. Rabinovich, A. Bowman, B. Feldman, G. Rosenblatt, IEEE Journal of Quantum Electronics, Vol. 26, (1990)
- "Three Micron Laser Performance of Ho:YAlO<sub>3</sub> and Nd:Ho:YAlO<sub>3</sub>", S. Bowman, W. Rabinovich, A. Bowman, B. Feldman, IEEE Journal of Quantum Electronics, vol. QE 26, No. 3, pp. 403-406, (1990)

- "Voltage-Length Products for Modal Evolution Type Digital Switches", W.K. Burns, Journal of Lightwave Technology, V. 8, #6, (1990)
- "Wavelength Dependence of Scattering Loss in Fluoride Optical Fibers", L. Busse, G. McCabe, I. Aggarwal, Optics Letters 15 (8), pp. 423-424, (1990)
- "Passive Laser Mode Locking with an Antiresonant Nonlinear Mirror", T.F. Carruthers, I.N. Duling, Optics Letters, V. 15, #14, (1990)
- "VUV Simulated Anti-Stokes Raman Emission in Inverted Selenium", D. Cooper, R. Auyeung, B. Feldman, IEEE, J. Quantum electronics, 26, 1546, (1990)
- "Ultraviolet Optical Isolator Utilizing KDP-Isomorphs", J. Dexter, J. Landry, D. Cooper, J. Reintjes, Optics Communications, Vol. 80, number 2, pp. 115-118, (1990)
- "Far Infrared Magneto-optical Study of Holes and Electrons in Zero-Gap HgTe/Cd<sub>0.85</sub>Hg<sub>0.15</sub>Te Superlattices", M. Dobrowolska, T. Wojtowicz, J. Luo, J. K. Furdyna, O. K. Wu, J. R. Meyer, C. A. Hoffman, F. J. Bartoli, L. R. Ram-Mohan, Semiconductor Science and Technology, 5, S102, (1990)
- "Far Infrared Magneto-Optical Study of Holes and Electrons in Zero-Gap HgTe/Cd<sub>0.85</sub>Hg<sub>0.15</sub>Te Superlattices", M. Dobrowolska, T. Wojtowicz, J. K. Furdyna, O. K. Wu, J.N. Schulman, J. R. Meyer, C. A. Hoffman, F. J. Bartoli, Phys. Rev. B. 41 5084, (1990)
- "Higher Order Electron Cyclotron Resonances in n-Type HgTe-CdTe Superlattices", M. Dobrowolska, T. Wojtowicz, J. Furdyna, J. Meyer, R. Feldman, R. Austin, L. Ram-Mohan, Appl. Phys. Lett., 57, 1781, (1990)
- "High Power Superfluorescent Fiber Source", I.N. Duling, W.K. Burns, L. Goldberg, Optics Letters, V.15, No. 1, (1990)
- "Phase Pulling in Transient Raman Amplifiers", M. Duncan, R. Mahon, L. Tankersley, G. Hilfer, J. Reintjes, JOSA-B, 7 202, (1990)
- "Control of Transverse Spatial Modes in Transient Stimulated Raman Amplification", M. Duncan, R. Mahon, L. Tankersley, J. Reintjes., JOSA B 7, 1336, (1990)
- "Chromatic Time Lag in Picosecond Streak Camera Measurements", M. Duncan, R. Mahon, Applied Optics 29, 2369, (1990)
- "Diode Pumped Holmium, Thulium and Erbium Lasers between 2 and 3  $\mu$ m Operating CW at Room Temperature", L. Esterowitz, Optical Engineering, Vol. 29 No. 6, p 676-680, (1990)
- "Spherical Cavity Mode Assignments of Optical Resonances in Microdroplets Using Elastic Scattering", J. Eversole, H-B. Lin, A. Huston, A. Campillo, JOSA-A, 7, 2159-2169, (1990)
- "Instrumentation for Time-Resolved Electron Diffraction", J. Ewbank, W. Faust, D. Monts, L. Schafer, R. Bakhtiar, Q. Dou, Mol. Cryst. Liq. Cryst. 187, 351, (1990)
- "Quantitative Analysis of Nickel and Copper in Zirconium Fluoride Using Graphite Furnace Atomic Absorption Spectrometry", K. Ewing, J. Jaganathan, E. O'Brien, I. Aggarwal, Microchemical Journal 41, pp. 106-112, (1990)

"Tetrahalodimolybdate(II) Complexes with Alkyl Substituted Pyridines. A Structural and Spectroscopic Study", K. Ewing, S. Shupack, A. Rheingold, Polyhedron, Vol. 9, pp. 1209-1215, (1990)

"Pattern Classification Using Projection Pursuit", T. Flick, L. Jones, R. Priest, C. Herman, Pattern Recognition, Vol. 23, p. 1367-1376, (1990)

"Interlaboratory Comparison of Radiation-Induced Attenuation in Optical Fibers, Part III, Transient Exposures", E. Friebele, P. Lyons, R. Gilbert, H. Henschel, A. Johan, J. Krinsky, W. Schneider, D. Smith, A. Robinson, E. Taylor, G. Turquet de Beauregard, R. West, P. Zagarino, Journal of Lightwave Technology, 8, 977-989, (1990)

"Blue Light Generation by Non-Linear Mixing of Nd:YAG and GaAlAs Laser Emission in KNbO<sub>3</sub> Resonant Cavity", L. Goldberg, M.K. Chun, I.Duling, T.F. Carruthers, Applied Physics Letters, V. 56, #21, (1990)

"Growth and Decay Kinetics of Defect Centers in High-Purity Fused Silicas Irradiated at 77K with X Rays or 6.4-eV Laser Light", D. Griscom, Nucl. Ins. Meth, B46, 12-17, (1990)

"Fast, Efficient Median Filters with Even Length Windows", J. Havlicek, K. Sarkady, G. Katz, J. McKeeman  
Electronics Letts., Vol. 26, No. 20, (1990)

"Glass Formation and Thermal Properties of Low-Silica Calcium Aluminosilicate Glasses", P. Higby, R. Ginther, I. Aggarwal, E. Friebele", Journal of Non-Crystalline Solids, Vol. 126, pp. 209-215, (1990)

"Electron Transport and Cyclotron Resonance in [211]-Oriented HgTe-CdTe Superlattices", C. Hoffman, J. Meyer, R. Wagner, F. Bartoli et al, J. Vac. Sci. Technol. A 8 1200, (1990)

"Transport Investigation of HgTe-CdTe Single and Multiple Quantum Wells", C. Hoffman, J. Meyer, F. Bartoli  
Surface Science 228, 45, (1990)

"Comparison of the 1x2 Directional Coupler and Asymmetric Mach-Zehnder Interferometer", M. Howerton, C.H. Bulmer, W.K. Burns, Journal of Lightwave Technology, V. 8, #8, (1990)

"Nonlinear MIE Scattering: Electrostrictive Coupling of Light to Droplet Acoustic Modes", A. Huston, H-B. Lin, J. Eversole, A. Campillo, Optical Letters, 15(21) 1176-1178, (1990)

"Solid-State Coherent Laser Radar Measurements on High Velocity Targets", A. Huston, M. Roe, Optics Letters, 15, 570-572, (1990)

"Excitonic Optical Nonlinearity in Quantum-Confined CuCl Doped Borosilicate Glass", B. Justus, M. Seaver, A. Campillo, Applied Physics Letters, 57(14), 1381-1383, (1990)

"IR Laser Induced Photoorientation of Li (H<sub>2</sub>O) in Solid Argon", Z. Kafafi, R. Pong, J. Shirk, J. Mol. Struct., 222, 245, (1990)

"Polarization Diversity Detection for Fiber Interferometers Using Active Feedback-Control of Output Polarization Mode Selection", A.D. Kersey, M.J. Marrone, A. Dandridge, Optics Letters, V. 15, No. 22, p. 1315, (1990)

- "Using Polarization Scrambling", A.D. Kersey, M.J. Marrone, A. Dandridge, Journal of Lightwave Tech., V. 8, p.838, (1990)
- "Novel Passive Phase Noise Cancelling Technique for Interferometric Fiber Optic Sensors", A. Kersey, T.A. Berkoff, Electronics Letters, V. 26, p. 640 , (1990)
- "Applications of Fiber-Optic Sensors", A.D. Kersey, A. Dandridge, IEEE Trans. on Components, Hybrids, V. 13, p. 137, (1990)
- "Quadrature Phase Sampling of a Fiber Interferometric by Input-Polarization Switching", A. D. Kersey, M.J. Marrone, Electronics Letters, V. 26, No. 11, p. 686, (1990)
- "Open Loop Fiber Optic Gyroscope with Phase Shift Nulling Signal Processing", A.D. Kersey, R.P. Moeller  
Electronics Letters, V. 26, #16, p. 1251, (1990)
- "Growth of Single Crystal Diamond by Combustion Synthesis", R. Komanduri, K. Snail, Phil. Mag Letters, vol. 62, p. 283-290, (1990)
- "Dual Excitation Scheme for Direct Suppression of Residual Signal in Fiber Optic magnetometer", K. Koo, D. Dagenais, F. Bucholtz, S. Vohra, Electronics Letters, V. 26, No. 22, p. 1867, (1990)
- "Double Resonance Stimulated Raman Scattering in Micrometer Sized Droplets", H-B. Lin, A. Huston, J. Eversole, A. Campillo, Journal of the Optical Society of America B, 7(10) 2079-2089, (1990)
- "Identification of Morphology Dependent Resonances in Stimulated Raman Scattering from Microdroplets", H-B. Lin, J. Eversole, A. Campillo, Optics Comm., 77, 407-410, (1990)
- "Vibrating Orifice Droplet Generator for Precision Optical Studies", H-B. Lin, J. Eversole, A. Campillo, Review of Scientific Instruments, 61, 1018-1023, (1990)
- "Frequency Pulling of Stimulated Raman Scattering in Microdroplets", H-B. Lin, J. Eversole, A. Campillo, Optics Letters, 15, 387-389, (1990)
- "Nonlinear Optical Properties of Benzimidazobenzophenanthroline Type Ladder Polymers", J. R.Lindle, F. J. Bartoli, C. A. Hoffman, O-K. Kim, Y. S. Lee, J. S. Shirk, Z. H. Kafafi, Appl. Phys. Lett., 56, 712, (1990)
- "Calculation of Scattering Loss as a Function of Cooling Rate for a Fluorozirconate Glass", G. Lu, P. Hart, I. Aggarwal, Physics and Chemistry of Glasses, Vol. 31 (5), pp. 205-208, (1990)
- "Gradients", Metallic Glass Ribbon Probe for the Measurement of the Magnetic Field, First and Second Order Field M.D. Mermelstein, A. Dandridge, Electronics Letters, V.26, p. 501, (1990)
- "Comment on "Thermal Noise in a Fiber Optic Sensor"", by T.J. Hofler, S.L. Garrett, M. Mermelstein, Journal of Acoustical Society of America, 87, p. 1362, (1990)
- "Magneto-Optical Properties of HgTe-CdTe Superlattices", J. Meyer, F. Bartoli, C Hoffman, L. Ram-Mohan, Phys. Rev. B. 42, 9050, (1990)
- "Band Edge Properties of Quasi-1D HgTe-CdTe Heterostructures", J. Meyer, F. Bartoli, C. Hoffman, L. R. Ram-Mohan, Physical Review Letters, 64, 1963, (1990)

"Laterally-Confined HgTe-CdTe Quantum Wells and Superlattices", J. Meyer, F. Bartoli, C. Hoffman, L. R. Ram-Mohan, Superlattices and Microstructures 7, 387, (1990)

"Narrow-Gap II-VI Superlattices: Correlation of Theory with Experiment", J. R. Meyer, Semiconductor Science and Technology, 5, S90, (1990)

"Reactions of Small Carbon Clusters with Water in Cryogenic Matrices. The FTIR Spectrum of Hydroxyethynylcarbene", B. Ortman, R. Hauge, J. Margrave, Z. Kafafi, J. Chem. Phys., 94, 7973, (1990)

"Efficient Room Temperature Operation of Cr<sup>3+</sup>-Sensitized, Flashlamp-pumped, 2 $\mu$ m Lasers", G. Quarles, C. Marquardt, L. Esterowitz, A. Rosenbaum, I. Abella, Optical and Quantum Electronics Journal, Special Issue on Solid State Lasers, Chapman and Hall Ltd 22, S141, (1990)

"Efficient Room Temperature Operation of a Flashlamp-pumped, Cr:Tm:YAG Laser at 2.01 $\mu$ m", G. Quarles, A. Rosenbaum, C. Marquardt, L. Esterowitz, Optics Letters, 15, 42, (1990)

"Polymer Membrane Properties and Structures for Membrane Light Modulator Applications", P. Rolsma, J. Lee, Optics Letters, Vol. 15, (1990)

"The Effect of AlF<sub>3</sub> on the Physical Properties and Stability of Fluoro-Zirconate and Fluorozirconate Glasses", J. Sanghera, P. Hart, M. Sachon, L. Busse, I. Aggarwal, Journal of American Ceramic Society, Vol. 73, pp. 2677-2683, (1990)

"New Fluorination Reactions of Ammonium Bifluoride", J. Sanghera, P. Hart, M. Sachon, K. Ewing, I. Aggarwal, Journal of American Ceramic Society 73, 1339-1346, (1990)

"Pumping Reactions in a Photoinitiated XeF<sub>2</sub>-D<sub>2</sub> Chemical Laser", S. Searles, M. Winings, Journal of Chemical Physics, 93, (7) 4713-4718, (1990)

"Noncontact Fluorescence Thermometry of Acoustically Levitated Water Drops", M. Seaver, J. Peele, Applied Optics, Vol 29, No. 33, pp. 4956-4961, (1990)

"Vibrational Selectivity in the Single Photon IR Photochemistry of Matrix Isolated 2-Fluoroethanol", J. Shirk, C. Marquardt, J. Chem. Phys., -92, 7234, (1990)

"Efficient, Broadly Tunable Laser-Pumped Tm:YAG and Tm:YSGG CW Lasers", R. Stoneman, L. Esterowitz, Optics Letters 15, 486, (1990)

"Characteristics of the High Pressure Ar/Xe Laser Pumped by an Electron Beam and an Electron-Beam Sustained Discharge", A. Suda, B. Wexler, B. Feldman, Journal of Quantum Electronics, QE-26, pp. 911-921, (1990)

"Interlaboratory Comparison of Radiation-Induced Attenuation In Optical Fibers. Part II: Steady State Exposures", E. Taylor, E. Friebele, H. Henschel, R. West, J. Krinsky, C. Barnes, Journal of Lightwave Technology, 8, 967-976, (1990)

"Si E' Centers and UV-Induced Compaction in High Purity Silica", T. Tsai, D. Griscom, E. Friebele, Nucl. Ins. Meth., B46, 265-268, (1990)

"High Efficiency, High Energy Performance of An X-ray Preionized Ar/Xe Laser", J. Tucker, B. Wexler, IEEE Journal of Quantum Electronics, 26, 1647, (1990)



"Effects of Helium Addition to Ar/Xe Mixtures in High-Pressure Atomic Transition of Xenon Lasers", B. Wexler, A. Suda, K. Riley, B. Feldman, IEEE Journal of Quantum Electronics, Vol. QE-26, No. 3, pp. 403-406, (1990)

"Stimulated Brillouin Scattering and Phase Conjugation of Multiline Hydrogen Fluoride Laser Radiation", W. Whitney, M. Duignan, B. Feldman, JOSA B, Vol. 7 No. 11, pp. 2160-2168, (1990)

"Novel FIR Nonlinear Optical Materials", E. R. Youngdale, C. A. Hoffman, J. R. Meyer, F. J. Bartoli, X. Chu, J. P. Faurie, J. W. Han, J. W. Cook Jr., J. F. Schetzina, N. A. Engelhardt, E. W. Niles, H. Hochst, Semiconductor Science and Technology, 5, S253, (1990)

"Nonlinear Optical Properties of MBE-Grown Bi<sub>1-x</sub>Sb<sub>x</sub>", E. Youngdale, J. Meyer, C. Hoffman, F. Bartoli  
Appl. Phys. Lett., 57, 336, (1990)

"Nonlinear Optical Coefficients of Narrow-gap Semiconductors", E. Youngdale, C. Hoffman, J. Meyer, F. Bartoli, J. Vac. Sci. Technol. A 8, 1215, (1990)

"Density-Gradient Theory Approach to Quantum Transport Simulation", M.G. Ancona, Superlattices and Microstructures, 7(2), 119, (1990)

"Macroscopic Description of Quantum-Mechanical Tunneling", M.G. Ancona, Physical Review B, 42(2), 1222, (1990)

"Lattice-Gas Approach to Semiconductor Device Simulation", M.G. Ancona, Solid State Electronics, Volume33(12), 1633-1642, (1990)

"Programmable Frequency Excision and Adaptive Filtering with a GaAs/AlGaAs/GaAs Heterojunction Photoconductor Array", G.W. Anderson, F.J. Kub, R.L. Grant, N.A. Papanicolaou, D.E. Brown, J.A. Modolo, Optical Engineering, 29(10), 1243, (1990)

"Photodetector Arrays and Architectures for Acousto-Optical Signal Processing", G.W. Anderson, F.J. Kub, G.M. Borsuk, Optical Engineering, 29(1), 58, (1990)

"Laser Annealed Refractory Metal Silicide Films on GaAs", W.T. Anderson, A. Christou, P.E. Thompson, C.R. Gossett, J.M. Eridon, Z. Hatzopoulos, C. Michelakis, D.V. Morgan, Electronics Letters, 26(1), 62-64, (1990)

"Heavy Ion Total Fluence Effects in GaAs Devices", W.T. Anderson, A.R. Knudson, A. Meulenbergh, H-L. Hung, J.A. Roussos, G. Kiriakidis, IEEE Transactions on Nuclear Science, 37(6), p. 2065, (1990)

"Photoemission Study of the Adsorption of Nitric Oxide on Gallium Arsenide (110) at Low Temperature", V.M. Bermudez, R.T. Williams, G.P. Williams Jr., M.W. Rowe, H. Liu, A. Wu, Journal of Vacuum Science and Technology, American Institute of Physics, A8(3), 1878-1883, (1990)

"Growth, Structure and Oxidation of Ordered Silicon Layers on Nickel (001)", V.M. Bermudez, Surface Science Letters/North Holland Publishers, 230, L155-L166, (1990)

"InAlAs/InGaAs/InP Junction HEMTs", J.B. Boos, S.C. Binari, W. Kruppa, H. Hier, IEE Electron Device Letters, 26(15), 1172-1173, (1990)

"Solid-State Quantum-Based Devices", Lattice Weyl-Wigner Formulation of Exact Many-Body Quantum-Transport Theory and Applications to Novel F.A. Buot, K.L. Jensen, Physical Review B, 42(15), 9429-9457, (1990)

"On the Quantum Theory of Electron Transport in the Wigner Formalism", F.A. Buot, Journal of Applied Physics, 68(7), 3418, (1990)

"Exact Integral Operator Form of the Wigner Distribution-Function Equation in Many-Body Quantum Transport Theory", F.A. Buot, Journal of Statistical Physics, 61(5/6), 1223-1256, (1990)

"The Photoluminescent Spectrum of Neutron Irradiated GaAs", C. Carlone, G. Bernier, S.M. Khanna, W.T. Anderson, J.W. Gerdes, C.H. Chern, IEEE Trans. On Nuclear Science, 37(6), pp. 1718-1725, (1990)

"Characterization of a Large Superconducting Split Pair Magnet for Swept Field Measurements", A.G. Crockett, T.A. Kennedy, Review of Scientific Instruments, 61(6), 1753-1755, (1990)

"The Properties of Y1Ba2Cu3O(7-d) Thin Films with Silver Doping by Spray Pyrolysis", E.J. Cukauskas, L.H. Allen, H.S. Newman, R.L. Henry, P.K. VanDamme, Journal of Applied Physics, 67(11), 6946-6952, (1990)

"Growth and Characterization of InSb/GaAs Grown Using Molecular Beam Epitaxy", J.L. Davis, P.E. Thompson, R.J. Wagner, M. Fatemi, Semicond. Science Technology, 5, S225, (1990)

"Growth by Molecular Beam Epitaxy of Indium Antimonide on Cleaved and Polished Barium Fluoride", J.L. Davis, Thin Solid Films, 192, 111-119, (1990)

"Deposition of (100) Oriented MgO Thin Films on Sapphire by a Spray Pyrolysis Method", W. DeSisto, R.L. Henry, Applied Physics Letters, 56(25), 2522, (1990)

"Photoreflectance Measurement of Strain in Epitaxial GaAs on Si", A. Dimoulas, P. Tzanetakis, A. Georgakilas, O.J. Glembocki, A. Christou, Journal of Applied Physics, 67, 4389, (1990)

"Double Crystal X-ray Analysis of Strain Distribution in Rapid Thermal Annealed, S-Implanted GaAs", M. Fatemi, P.E. Thompson, J. Chaudhuri, S. Shah, Journal of Applied Physics, 68(8), 3964-3969, (1990)

"X-ray Diffraction Analysis of SiGe/Si Superlattices", M. Fatemi, S.M. Prokes, B.V. Shanabrook, K.L. Wang, Advances in X-ray Analysis, 33, p. 75, (1990)

"High Resolution Measurement of Surface Misorientation in Single Crystal Wafers", M. Fatemi, Advances in X-ray Analysis, 33, p. 83, (1990)

"Low Energy Electron Diffraction, Auger and Energy Loss Spectroscopic Study of the Initial Stages of Growth by Molecular Beam Epitaxy of GaAs on Si(211) Substrates", L. Fotiadis, R. Kaplan, Thin Solid Films, 184, 415-422, (1990)

"Nonlinear Analysis of the Cerenkov Maser", H.P. Freund, A.K. Ganguly, Physics of Fluids, B2(10), 2506, (1990)

"The High Temperature Behavior of the Fractional Quantum Hall Effect", J.E. Furneaux, D.A. Syphers, J. Poulin, B.A. Mason, Surface Science, 229, (1990)

"Density and Concentration Fluctuations in Plasticized Poly(Cyclohexyl Methacrylate)", G. Fytas, G. Floudas, K.L. Ngai, *Macromolecules*, American Chemical Society, 23(4), 1104-1109, (1990)

"Spin Density Waves in a Quasi-Two Dimensional Electron Gas", D. Gammon, B.V. Shanabrook, J.C. Ryan, D.S. Katzer, *Physical Review B*, 41(17), 12311-12314, (1990)

"Interfaces in GaAs/AlAs Quantum Well Structures", D. Gammon, D.S. Katzer, B.V. Shanabrook, *Applied Physics Letters*, 57(25), 2710, (1990)

"Linear Theory of a Field Emitter Array Distributed Amplifier", A.K. Ganguly, P.M. Phillips, H.F. Gray  
*Journal of Applied Physics*, 67(11), 7098-7110, (1990)

"Nonlinear Theory of the Slow Wave Cyclotron Amplifier", A.K. Ganguly, S. Ahn, *Physical Review A*, 42(6), 3544, (1990)

"Band-Gap Determination by Photoreflectance of InGaAs and InAlAs Lattice Matched to InP", D.K. Gaskill, N. Bottka, L. Aina, M. Mattingly, *Applied Physics Letters*, 56, 1269, (1990)

"Detection of Magnetic Resonance of Photoluminescence from a Si/SixGe(1-x) Strained-Layer Superlattice", E. Glaser, J.M. Trombetta, S.M. Prokes, O.J. Glembocki, K.L. Wang, C.H. Chern, *Physical Review Letters*, 65(10), 1247-1250, (1990)

"Infrared Study of High Pressure and High Temperature Coadsorption of CO and H<sub>2</sub> on Clean and on Carbided Ni(100)", A.S. Glass, V.M. Bermudez, *Journal of Vacuum Science and Technology*, A8(3), 2622, (1990)

"A Si<sub>0.7</sub>Ge<sub>0.3</sub> Strained Layer Etch Stop for the Generation of Thin Layer Undoped Silicon", D.J. Godbey, M.E. Twigg, L.J. Palkuti, P. Leonov, H.L. Hughes, F.J. Kub, *Applied Physics Letters*, 56(4), 373-375, (1990)

"Fabrication of Bond and Etch Back Silicon on Insulator Using a Strained Si<sub>0.7</sub>Ge<sub>0.3</sub> Layer as an Etched Stop", D.J. Godbey, M.E. Twigg, H.L. Hughes, L.J. Palkuti, P. Leonov, J.J. Wang, *Journal of the Electrochemical Society*, 137(10), 3219-3223, (1990)

"MBE-Grown Germanium on Sapphire (1102)", D.J. Godbey, S.B. Qadri, M.E. Twigg, E.D. Richmond  
*Thin Solid Films*, 184, 379-386, (1990)

"Anomalous Magneto-Transport and Optical Transmission of PbTe Thin Flms", B.B. Goldberg, J.E. Furneaux, J. Oswald, G. Bauer, P.J. Stiles, *Semicond Science & Technology*, 5, S151, (1990)

"Growth of (100) GaAs by Vertical Zone Melting", R.L. Henry, P.E.R. Nordquist, R.J. Gorman, S.B. Qadri  
*Journal of Crystal Growth*, (1990)

"Growth of Oxide Layers on Gallium Arsenide with a High Kinetic Energy Atomic Oxygen Beam", M.A. Hoffbauer, J.B. Cross, V.M. Bermudez", *Applied Physics Letters*, American Institute of Physics, Volume57(21), 2193, (1990)

"The Effects of Scatterinig on Current-Voltage Characteristics, Transient Response, and Particle Trajectories in the Numerical Simulation of Resonant Tunneling Diodes", K.L. Jensen, F.A. Buot, Journal of Applied Physics, 67(12), 7602-7607, (1990)

"Numerical Aspects on the Simulation of I-V Characteristics and Switching Times of Resonant Tunneling Diodes", K.L. Jensen, F.A. Buot, Journal of Applied Physics (Brief Communications), 67(4), 2153-2155, (1990)

"Critical Temperature in High Tc Layered Superconductors: Dependence on the Number of Interacting Conducting Layers per Unit Cell", S.S. Jha, A.K. Rajagopal, Physica C, 168, 173-184, (1990)

"Microwave Detected Optical Response of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>(7-x)</sub> Thin Films", R. Kaplan, W.E. Carlos, E.J. Cukauskas, J. Ru, Journal of Applied Physics, 67(9), 4212-4216, (1990)

"Optically Detected Magnetic Resonance of Cubic SiC Grown by Chemical Vapor Deposition on Si", T.A. Kennedy, J.A. Freitas, S.G. Bishop, Journal of Applied Physics, 68(12), 6170-6173, (1990)

"Occupation of Quantum States Determined by Energy Storage in Superlattice Quantum State Transfer Devices", S.W. Kirchoefer, Applied Physics Letters, 57(11), 1143, (1990)

"1.54 mm Electroluminescence in MeV Ion Implanted Er-doped GaAs", P.B. Klein, F.G. Moore, H.B. Dietrich  
Electronics Letters, 26(16), 4299, (1990)

"Saturation of Radiation-Induced Threshold-Voltage Shifts in Thin Oxide MOSFETs at 80K", R.B. Klein, N.S. Saks, Z. Shanfield, IEEE Transactions on Nuclear Science, 37(6), 1690, (1990)

"Programmable Analog Vector-Matrix Multipliers", F.J. Kub, K.K. Moon, I.A. Mack, F. Long, IEEE Solid State Circuitry Journal, 25(1), 207, (1990)

"Radiation Hardened SOS MOSFET Technology for Infrared Focal Plane Readouts", F.J. Kub, J.R. Waterman, C.T. Yao, IEEE Transactions on Nuclear Science, 37(6), 2020, (1990)

"Room Temperature Emission of Highly Excited GaAs/GaA(1-x)AlxAs Quantum Wells", E. Lach, A. Forchell, D.A. Broido, T.L. Reinecke, G. Weimann, W. Schlapp, Physical Review B, 42(8), 5395, (1990)

"A Wideband mm-Wave Monolithic Receiver", C.L. Lan, J.C. Chen, C.K. Pao, M.I. Herman, M. Sokolich, R.E. Neidert, Microwave Journal, 93, (1990)

"Residual Defects in AlGaAs Co-Implanted with Be and P or As", R. Magno, R. Shelby, B. Molnar, Journal of Applied Physics, 68(10), 5090, (1990)

"Electronic "Neural" Net Algorithm of Maximum Entropy Solutions to Ill-Posed Problems-Part II: Multiply Connected Electronic Circuit Implementation", C.R.K. Marrian, I.A. Mack, C. Banks, M.C. Peckerar, IEEE Transactions on Circuits and Systems, 37(10), 110, (1990)

"Lithographic Studies of an E-Beam Resist in a Vacuum Scanning Tunneling Microscope", C.R.K. Marrian, E.A. Dobisz, R.J. Colton, Journal of Vacuum Science and Technology, A8, 3563, (1990)

- "Low Voltage E-Beam Lithography with a UHV Scanning Tunneling Microscope", C.R.K. Marrian, R.J. Colton, Applied Physics Letters, 56(8), 755, (1990)
- "Infrared Reflection Absorption Spectroscopy Study of the Chemisorption of Small Molecules (H<sub>2</sub>, O<sub>2</sub> and H<sub>2</sub>O) on Si", M. McGonigal, V.M. Bermudez, J.E. Butler, Journal of Electron Spectroscopy and Related Phenomena, 54/55, 1033-1044, (1990)
- "A Study of Si Implanted with Oxygen Using Spectroscopic Ellipsometry", P.J. McMarr, B.J. Mrstik, M.S. Barger, G. Bowden, J.R. Blanco, J. Appl. Phys., 67 (12), 7211-7212, (1990)
- "Silicon Implantation Into GaAs: Observations of Dose Rate Dependent Electrical Activation and Damage", F.G. Moore, H.B. Dietrich, E.A. Dobisz, O.W. Holland, Applied Physics Letters, 57(9), 911, (1990)
- "Comment on "Nature Acceptor Levels in Ga-Rich GaAs", [Journal of Applied Physics, 65, p 596], W.J. Moore, B.V. Shanabrook, Journal of Applied Physics, 67(12), 7618, (1990)
- "Star Polymer Diffusion in Concentrated Solutions: Dependence on Functionality via the Coupling Model", K.L. Ngai, A.K. Rajagopal, T.P. Lodge, Journal of Polymer Science: Part B: Polymer Physics, 28, 1367-1377, (1990)
- "Breakdown of Time-Temperature Superposition in Miscible Polymer Blends and the Coupling Scheme", K.L. Ngai, D.J. Plazek, Macromolecules, 23, 4282-4287, (1990)
- "Comparison Between Frequency-Dependent Specific Heat and Dielectric Relaxation of Glycerol and Propylene Glycol", K.L. Ngai, R.W. Rendell, Physical Review B, 41(1), 754-756, (1990)
- "VZM Growth of GaAs", P.E.R. Nordquist, R.L. Henry, J.S. Blakemore, W.J. Moore, R.J. Gorman, H.B. Dietrich, Proc Inst. Phys. Conf., Ser No 112, Chapter 2, p. 49, (1990)
- "Analysis of Dark Current in IR Detectors on Thinned p-Type HgCdTe", J.P. Omaggio, IEEE Transactions on Electron Devices, 37(1), 141, (1990)
- "Experimental Study of a Ka-Band Gyrotron Backward Wave Oscillator", S.Y. Park, R.H. Kyser, C.M. Armstrong, R.K. Parker, V.L. Granatstein, IEEE Transactions on Plasma Science, 18(3), pp. 321-325, (1990)
- "Review of Two Stream Amplifier Performance", P.M. Phillips, E.G. Zaidman, H.P. Freund, A.K. Ganguly, N.R. Vanderplaats, IEEE Journal for Vacuum Electron Devices, 37(3), 870-877, (1990)
- "Propagation and Circuit Characteristics of Inductively-Coupled Superconducting Microstrip", J.M. Pond, P.F. Weaver, I. Kaufman, IEEE Transactions on Microwave Theory and Techniques, 38(11), 1635-1643, (1990)
- "X-ray Studies of Heat Treated SiGe/Si Strained-Layer Superlattices", S.M. Prokes, M. Fatemi, K.L. Wang, Journal of Vacuum Science & Technology, B, 8(2), 254-257, (1990)
- "The Mechanism of Epitaxial Si-Ge/Si Heterostructure Formation by Wet Oxidation of Amorphous Si-Ge Thins Films", S.M. Prokes, A.K. Rai, Journal of Applied Physics, 67(2), 807, (1990)
- "Interdiffusion Measurements in Asymmetrically Strained SiGe/Si", S.M. Prokes, K.L. Wang, Applied Physics Letters, 56(26), 2628, (1990)

"Effective Temperature and Relaxation in Complex Systems", A.K. Rajagopal, K.L. Ngai, S. Teitler, Journal of Chemical Physics, American Institute of Physics, 92(1), 243-246, (1990)

"Critical Temperature in High Tc Layered Superconductors: Dependence on Structure and Number of Interacting Conducting Layers per Unit Cell", A.K. Rajagopal, S.S. Jha, Solid State Communications, 73(11), 763-766, (1990)

"Parameter Compatibility Relations for Accelerated Testing", A.K. Rajagopal, S. Teitler, IEEE Transactions on Reliability, 39(1), 110-113, (1990)

"Si-Implantation into GaAs Grown on Si", M.V. Rao, R.S. Babu, A.K. Berry, H.B. Dietrich, N. Bottka, Journal of Electronic Materials, IEEE, 19, 789-794, (1990)

"Dual Implants in InGaAs", M.V. Rao, F.G. Moore, H.B. Dietrich, Journal of Applied Physics, 68(7), 3763, (1990)

"MeV Be-Implantation in GaAs", M.V. Rao, P.E. Thompson, H.B. Dietrich", Journal of Applied Physics, 67(10), 6165-6170, (1990)

"Vibrational Properties of the Reconstructed W(100) Surface from Total Energy Results", T.L. Reinecke, S.C. Ying, Superlattices and Microstructures, 7(3), 211, (1990)

"Evidence for Anomalous Structural Relaxation in SiO<sub>2</sub> Films", R.W. Rendell, K.L. Ngai, Applied Physics Letters, 57(23), 2428-2430, (1990)

"Molecular Beam Epitaxy versus Chemical Vapor Deposition of Silicon on Sapphire", E.D. Richmond, M.E. Twigg, S.B. Qadri, J.G. Pellegrino, M.T. Duffey, Applied Physical Letters, 56(25), pp. 2551-2554, (1990)

"Unique Properties of Molecular Beam Epitaxy Silicon on Sapphire Using in situ High-Temperature Substrate Annealing Compared with Chemically Vapor Deposited Silicon on Sapphire", E.D. Richmond, J.G. Pellegrino, M.E. Twigg, S.B. Qadri, M.T. Duffey, Thin Solid Films, 192, 287-294, (1990)

"Deposition and Characterization of MgO/Au Cermet Films", V.H. Ritz, Surface and Interface Analysis, 15, 173-179, (1990)

"Temperature Dependent Exciton Linewidths in Semiconductors", S. Rudin, T.L. Reinecke, B. Segall  
Physical Review B, 42(17), 218, (1990)

"Temperature-Dependent Exciton Linewidths in Semiconductor Quantum Wells", S. Rudin, T.L. Reinecke  
Physical Review B, 41(5), 3017, (1990)

"Electron-LO-Phonon Scattering Rates in Semiconductor Quantum Wells", S. Rudin, T.L. Reinecke, Physical Review B, 41(11), 7713, (1990)

"Determination of Interface Trap Capture Cross Sections Using Three-Level Charge Pumping", N.S. Saks, M.G. Ancona, IEEE Electron Device Letters, 11(8), 339, (1990)

"Spatial Uniformity of Interface Trap Distribution in MOSFET's", N.S. Saks, M.G. Ancona, IEEE Transactions on Electron Devices, 37(4), 1057, (1990)

"Observation of H<sup>+</sup> Motion During Interface Trap Formation", N.S. Saks, D.B. Brown, IEEE Transactions on Nuclear Science, 37(6), 1624-1631, (1990)

"LO-Phonon-Assisted Emission Edge of Free Excitons in GaAs and GaAs/GaxAl(1-x) As Quantum Wells", B.V. Shanabrook, S. Rudin, T.L. Reinecke, W. Tseng, P. Newman, Physical Review B, 41(3), 1577, (1990)

"Applied Physics Letters", R.S. Sillmon, J.A. Freitas, 56(2), 174-176, (1990)

"Light-Activated Two-Level Resistance Switching: An Extremely Sensitive GaAs/AlGaAs Solid-State Photon Counter", E.S. Snow, P.M. Campbell, O.J. Glembocki, W.J. Moore, Applied Physics Letters, 56(2), 117, (1990)

"Strain-Induced Two-Dimensional Electron Gas in (111) Growth-Axis Strained-Layer Structures", E.S. Snow, B.V. Shanabrook, D. Gammon, Applied Physics Letters, 56(8), 785, (1990)

"Post-Irradiation Behavior of the Interface State Density and the Trapped Positive Charge", R.E. Stahlbush, B.J. Mrstik, R.K. Lawrence, IEEE Trans Nucl Science, 37(6), pp. 1641-1649, (1990)

"Far Infrared Photoresponse of Quasi-Two Dimensional Granular NbN/BN Films", U. Strom, J.C. Culbertson, S.A. Wolf, S. Perkowitz, G.L. Carr, Physical Review B, 42(7), 4059, (1990)

"Thermionic Sources for High Brightness Electron Beams", R.E. Thomas, J.W. Gibson, G.A. Haas, R.H. Abrams Jr., IEEE Transactions on Electron Devices, 37(3), 850- 861, (1990)

"Atomic Profiles and Electrical Characteristics of Very High Energy (8-20 MeV) Si Implants in GaAs", P.E. Thompson, H.B. Dietrich, J.M. Eridon, Journal of Applied Physics, 67(3), 1262, (1990)

"Relief of Compressive Biaxial Strains in Thin Films via Microtwins", M.E. Twigg, E.D. Richmond, J.G. Pellegrino, Journal of Applied Physics, 67(8), 3706-3710, (1990)

"Line Tension of Extended Double Kinks in Thin Films", M.E. Twigg, J. Appl. Phys., 68, 5109, (1990)

"Ionizing Radiation Effects on HgCdTe MIS Devices", J.R. Waterman, M. Moriwaki, J. Srour, L. Lou  
IEEE Transactions in Nuclear Science, 37, 6, 2034, (1990)

"Laser-Annealed Refractory Metal Silicide Films on GaAs", W.T. Anderson, A. Christou, P.E. Thompson, C.R. Gossett, J.M. Eridon, Z. Hatzopoulos, T. Efthimipoulos, M. Kudumas, C. Michelakis, D.V. Morgan, Electronics Letters, Vol. 26, 62-64, (1990)

"Photoemission Study of the Adsorption of Nitric Oxide on Gallium Arsenide (110) at Low Temperature", V.M. Bermudez, R.T. Williams, G.P. Williams Jr., M.W. Rowe, H. Liu, H.R. Sadeghi, J.C. Rife, J. Vac. Sci. Technol. A 8(3), p. 1878, (1990)

"Magnetic Coupling in High Moment fcc Fe/Ni Multilayers", A.S. Edelstein, C. Kim, S.B. Qadri, K.H. Kim, V. Browning, H.Y. Yu, B. Maruyama, R.K. Everett, Solid State Communications, Vol. 76, No. 12, pp. 1379-1382, (1990)

"MBE-Grown Germanium on Sapphire (1102)", D.J. Godbey, S.B. Qadri, M.E. Twigg, E.D. Richond, Thin Solid Films, 184, 379-386, (1990)

"Growth of (100) GaAs by Vertical Zone Melting", R.L. Henry, P.E.R. Nordquist, R.J. Gorman, S.B. Qadri, Journal of Crystal Growth, (1990)

"Microstructural and Superconductive Studies of Ag-YBa<sub>2</sub>Cu<sub>3</sub>O(7-x) Composites", H.R. Khan, T.L. Francavilla, R.A. Hein, C.S. Pande, S.B. Qadri, R.J. Soulen Jr., S.A. Wolf, J. of Supercond., Vol. 3, No. 2, 189, (1990)

"Ion-beam-sputtered Cu/Ni and Fe/Ni Multilayers", C. Kim, S.B. Qadri, P. Lubitz, T.E. Schlesinger, R.C. Cammarata, A.S. Edelstein, Mater. Sci. Engr. A126, (1990)

"Synthesis and Structure of Ion-Beam Sputtered Multilayer Fe/Ni Films", C. Kim, S.B. Qadri, H.Y. Yu, K.H. Kim, B. Maruyama, A.S. Edelstein, J. Vac. Sci. Technol. A8(3), p.1407, (1990)

"Synthesis and Structural Properties of Ion-Beam Sputtered Cu/Ni Multilayers", C. Kim, S.B. Qadri, M. Twigg, A.S. Edelstein, J. Vac. Sci. Technol. A8(4), p. 3466, (1990)

"Molecular Beam Epitaxy Versus Chemical Vapor Deposition of Silicon on Sapphire", E.D. Richmond, M.E. Twigg, S.B. Qadri, J.G. Pellegrino, M.T. Duffey, Appl. Phys. Lett. 56 (25), p. 2551, (1990)

"Observation of H<sup>+</sup> Motion During Interface Trap Formation", N.S. Saks, D.B. Brown, IEEE Trans. Nucl. Sci., Vol. 37, No. 6, (1990)

"Nonlinear Optical Properties of Benzimidazobenzophenanthroline Type Ladder Polymers", J.R. Lindle, F.J. Bartoli, C.A. Hoffman, O-K. Kim, Y.S. Lee, J.S. Shirk, Z.H. Kafafi, Appl. Phys. Lett., 56, 712, (1990)

"Lithographic Studies of an E-Beam Resist in a Vacuum Scanning Tunneling Microscope", C.R.K. Marrian, E.A. Dobisz, R.J. Colton, J. Vac. Sci. & Technol., A8, 3563, (1990)

"Low Voltage E-Beam Lithography with a UHV Scanning Tunneling Microscope", C.R.K. Marrian, R.J. Colton, Appl. Phys. Lett., 56, 755, (1990)

"Infrared Reflection Absorption Spectroscopy Study of the Chemisorption of Small Molecules (H<sub>2</sub>, O<sub>2</sub> and H<sub>2</sub>O) on Silicon", M. McGonigal, V.M. Bermudez, J.E. Butler, J. Electron Spectrosc. & Relat. Phenom., 54/55, 1033, (1990)

"Methyl Radical Formation From Filament Pyrolysis of Acetylene/Hydrogen Mixtures Within Quartz Tubes", E. Villa, J.A. Dagata, J. Horwitz, D. Squire, M.C. Lin, J. Vac. Sci. Tech., A8, 3237, (1990)

"Sub-Micron Lithography Using Excimer Laser and Mercury Lamp Contact Printing", J.M. Calvert, R.J. Hershey, M.C. Peckerar, M.L. Rebbert, P.E. Pehrsson, J.H. Georger, Scanning, 12, 5, I-61, (1990)

"E-beam Deposition of ZrO<sub>2</sub>-Sc<sub>2</sub>O<sub>3</sub> Films", S.B. Qadri, E.F. Skelton, M. Harford, P. Lubitz, L. Aprigliano, J. Appl. Phys. 67 (5), p 2655, (1990)

"Far-Infrared Photoresponse of Quasi-Two-Dimensional Granular NbN/BN Films", U. Strom, J.C. Culbertson, S.A. Wolf, S. Perkowitz, G.L. Carr, Physical Review B, 42(7), 4059, (1990)



"Microwave and Magneto-Optic Properties of Bismuth Substituted Yttrium Iron Garnet Thin Films", J. Butler, J. Kramer, R. Esman, A. Craig, J. Lee, T. Ryuo, Journal of Applied Physics, vol. 67, pp. 4938-4940, (1990)

"Sub-Micron Lithography Using Excimer Laser and Mercury Lamp Contact Printing", J.M. Calvert, R.J. Hershey, M.C. Peckerar, M.L. Rebbert, P.E. Pehrsson, J.H. Georger, Scanning, 12, 5, I-61, (1990)

"Fabrication of Sub-Micron Features in Silicon Using 248 nm Lithography With Plasma-Hard Metal Mask", J.M. Calvert, M.C. Peckerar, J.H. Georger\*, C.S. Dulcey\*, Scanning, 12, 5, I-60, 1990.

"Fabrication of High Performance Infrared Filters and Mirrors", E.P. Donovan, NRL Review, pp. 207-210, 1990.

"Solid-State Supercomputing", L.L. Boyer, B.M. Klein, D.A. Papaconstantopoulos, W.E. Pickett, NRL Review, p. 39, (1990)

"Indicator of High-Temperature Oxide Superconductors", H.A. Hoff, M.S. Osofsky, NRL Review, pp. 99-101, (1990)

"New Frontiers in Electronics at NRL", G.M. Borsuk, NRL Review, pp. 53-64, (1990)

"Laser Produced Optically-Thin Strongly Coupled Plasmas", A. N. Mostovych, K. J. Kearney, and J. A. Stamper, Strongly Coupled Plasma Physics, S. Ichimaru, ed. Elsevier, 1990

"Electron Accelerators Driven by Modulated Intense Relativistic Electron Beams", M. Friedman, V. Serlin, Y. Y. Lau and J. Krall, Intense Microwave and Particle Beams, SPIE, 1226, 416, 1990

"The Influence of Beam Loading on the Operation of the Relativistic Klystron Amplifier", M. Friedman, V. Serlin, D. Colombant, J. Krall and Y. Y. Lau, Intense Microwave and Particle Beams, SPIE, 1226, 2, 1990

"The Physics and Applications of Modulated Intense Relativistic Electron Beams", M. Friedman, V. Serlin, Y. Y. Lau and J. Krall, Proceedings of the 8th International Conference on High-Power Beams, p. 53, 1990.\*

"Nike: A 4-5 Kilojoule, Ultra-Uniform KrF Laser", C. J. Pawley, S. E. Bodner, K. J. Kearney, R. H. Lehmborg, A. N. Mostovych, S. P. Obenshain, M. S. Pronko, J. D. Sethian, J. A. Stamper, A. V. Deniz, T. Lehecka. Proceedings of Lasers '90 Conference, 1990.\*

"Sodium Z-Pinches for X-ray Laser Research on the 6-TW Double-Eagle Generator", C. Deeney, T. Nash, R. R. Prasad, M. Krishnan, D. Hinshelwood, F. C. Young, Proceedings of International Conference on Lasers'89, D. G. Harris and T. M. Shay, eds. (New Orleans, LA, 3-8 December 1989), p. 21, 1990.\*

"Ion Transport for LMP", D. Mosher, D. D. Hinshelwood, J. M. Neri, P. F. Ottinger, J. Watrous, C. L. Olson, T. A. Mehlhorn, Proceedings of the 8th International Conference on High-Power Particle Beams, p. 26, 1990.\*

"Axially Resolved PEOS Experiments at Microsecond Conduction Times", D. D. Hinshelwood, R. J. Commisso, J. M. Grossmann, P. J. Goodrich, P. F. Ottinger, B. V. Weber, Proceedings of the 8th International Conference on High-Power Particle Beams, p. 1034, 1990.\*

"Plasma Erosion Opening Switch Operation in the 50 Ns - 1  $\mu$ s Conduction Time Range", B. V. Weber, R. J. Commisso, G. Cooperstein, P. J. Goodrich, J. M. Grossmann, D. D. Hinshelwood, J. C. Kellogg, D. Mosher, J. M. Neri, P. F. Ottinger, Proceedings of the 8th International Conference on High-Power Particle Beams, p. 406, 1990.\*

"Calculated Non-Linear Magnetic Field Penetration of Plasma Opening Switches", R. J. Mason, M. E. Jones, D. C. Wilson, C. Bergman, K. Thiem, J. M. Grossmann, P. F. Ottinger, Proceedings of the 8th International Conference on High-Power Particle Beams, p. 1058, 1990.\*

"Plasma Filled Diode Operation with Plasma Created in Situ by a Low Pressure Hollow Gas Discharge", A. E. Blaugrund, G. Cooperstein, W. F. Oliphant, S. J. Stephanakis, B. V. Weber, Proceedings of the 8th International Conference on High-Power Particle Beams, p. 463, 1990.\*

"Preliminary Results from 1- $\mu$ s Plasma Opening Switch Experiments on Hawk", R. J. Commisso, J. R. Boller, J. C. Kellogg, P. F. Ottinger, B. V. Weber, Proceedings of the 1990 DNA Advanced Pulsed Power Conference, DASIAC TR-90-006, p. 7, 1990.\*

"System Study for Decade Using Inductive Storage Technology", P. F. Ottinger, D. V. Rose, J. Neri, R. J. Commisso, Proceedings of the 1990 DNA Advanced Pulsed Power Conference, DASIAC TR-90-006, p. 5, 1990.\*

"Light Ion Beams for Material Response Simulation", D. Mosher, S. J. Stephanakis, F. C. Young, G. Cooperstein, R. J. Commisso, P. J. Goodrich, D. D. Hinshelwood, J. M. Neri, B. V. Weber, S. H. Richter, L. M. Lee, D. V. Keller, Proceedings of the 1990 DNA Advanced Pulsed Power Conference, DASIAC TR 90-006, p. 2, 1990.\*

"Dynamics, Catastrophe and Magnetic Energy Release of Toroidal Solar Current Loops", J. Chen, Geophysical Monograph 58, p. 269, 1990.

"Large Scale Plasma Irregularities and Airglow Enhancements from Ionospheric Heating", P. A. Bernhardt, H. Rowland, L. M. Duncan, C. A. Tepley, NATO AGARD Conference Proceedings, 13-1, 1990.\*

"Laboratory Simulation of High-Altitude Disruptive Effects", B. H. Ripin, J. Grun, C. K. Manka, J. A. Stamper, E. A. McLean, J. Resnick, R. Burris, J. Crawford, J. D. Huba, G. Ganguli, NATO AGARD Conference Proceedings, 32-1, 1990.\*

"Ionospheric Chemical Releases", P. A. Bernhardt, W. A. Scales, NATO AGARD Conference Proceedings, 1990.\*

"Theory of Large-Scale HF Heating Processes in the Unstructured and Structured Ionosphere", M. J. Keskinen, P. K. Chaturvedi, S. L. Ossakow, NATO AGARD Conference Proceedings, 10-1, 1990.\*

"The NRL plasma-filled Gyrotron Experiment", S. H. Gold, C. A. Sullivan, A. C. Ting, A. W. Fliflet, W. M. Manheimer, D. A. Kirkpatrick, A. K. Kinkead, Proceedings of the Fifteenth International Conference on Infrared and Millimeter Waves, SPIE 1514, 672, 1990.\*

"Design of the NRL 280 GHz IREC Maser Experiment", R. B. McCowan, T. A. Hargreaves, A. W. Fliflet  
Proceedings of the Fifteenth International Conference on Infrared and Millimeter Waves, SPIE 1514, 678, 1990.\*

- "An Improved 94 GHz TE<sub>13</sub> Gyrotron", M. Rhinewine, T. A. Hargreaves, M. L. Barsanti, G. Bergeron, M. Czarnaski, Proceedings of the Fifteenth International Conference on Infrared and Millimeter Waves, SPIE 1514, 578, 1990.\*
- "An Energy Recovery System for a Quasi-Optical Gyrotron", A. Singh, V. L. Granatstein, G. Hazel, G. Saraph, J. M. Cooperstein, Proceedings of the Fifteenth International Conference on Infrared and Millimeter Waves, SPIE 1514, 333, 1990.\*
- "A Two-Cavity Quasioptical Gyroklystron", R. P. Fischer, W. M. Manheimer, Proceedings of the Fifteenth International Conference on Infrared and Millimeter Waves, SPIE 1514, 1990.\*
- "Depressed Collector Performance on the NRL Quasioptical Gyrotron", T. A. Hargreaves, A. W. Fliflet, R. P. Fischer, M. L. Barsanti, Proceedings of the Fifteenth International Conference on Infrared and Millimeter Waves, SPIE 1514, 330, 1990.\*
- "The NRL 85 GHz CARM Amplifier Experiment", C. A. Sullivan, R. B. McCowan, S. H. Gold, Proceedings of the Fifteenth International Conference on Infrared and Millimeter Waves, SPIE 1514, 675, 1990.\*
- "WARP: A 3D (+) PIC Code for HIF Simulations", A. Friedman, D. A. Callahan, D. P. Grote, A. B. Langdon, Proceedings of the Conference on Computer Codes and the Linear Accelerator Community, 1990.\*
- "The NRL Modified Betatron Accelerator", L. K. Len, T. Smith, J. Golden, S. J. Marsh, D. Dialetis, J. Mathew, P. LOSchialpo, J. H. Change, C. A. Kapetanacos, Proceedings of the 2nd European Particle Accelerator Conference, 1, 446, 1990.\*
- "A 3D Particle Simulation Code For Heavy Ion Fusion Accelerator Studies", A. Friedman, R. O. Bangerter, D. A. Callahan, D. P. Grote, A. B. Langdon, Proceedings of the 2nd European Particle Accelerator Conference, 1, 1990.\*
- "Progress in the Development of the NRL Modified Betatron Accelerator", L. K. Len, T. Smith, J. Golden, K. Smith, S. J. Marsh, Proceedings in the Intense Microwave and Particle Beams, SPIE 1226, 382, 1990.\*
- "Collective Effects in the Free Electron Laser", P. Sprangle, C. M. Tang, C. W. Roberson, Laser Handbook, 6, 8, 1990.
- "Measurements of Vacuum Field Emission from Bio-Molecular and Semiconductor-Metal Eutectic Composite Microstructures", D. A. Kirkpatrick, A. C. Ting, P. E. Schoen, W. B. Stockton, R. Price, S. Baral, B. Kahn, J. M. Schnur, M. Levinson, B. M. Ditchek, Proceedings of the 14th International Symposium on Discharges and Electrical Insulation in Vacuum, 1990.\*
- "Calculation of the Line Emission from Cylindrical Krypton Plasmas Using a 162-Level, 511-Line Detailed Configuration Atomic Model", J. P. Apruzese and P. C. Kepple, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, 529, 1990.
- "Aluminum Wire Array Implosions: Comparison of Experiments and Simulation", J. L. Giuliani, Jr, and J. E. Rogerson, C. Deeney, T. nash, R. R. Prasad, and M. Krishnan, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, 471, 1990.

"Transition From  $I_4$  to  $I_2$  Scaling of K-Shell Emission in Aluminum Array Implosions", J. W. Thornhill, K. G. Whitney, and J. Davis, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, 251, 1990.

"Basic Considerations for Scaling Z-Pinch X-ray Emission with Atomic Number", K. G. Whitney, J. W. Thornhill, J. P. Apruzese, and J. Davis, Journal of Applied Physics 67(4), 1725, 1990.

"Evolution of an X-Pinch Plasma", F. L. Cochran, J. Davis, Physics Fluids B 2(6), 1238, 1990.

"Comparison of Coolants for Achieving Short-Wavelength Recombination Lasing", J. W. Thornhill, J. P. Apruzese, J. L. Giuliani, and D. Roelant, Journal of Applied Physics, 68(1), 33, 1990.

"Imploding Neon Puff-Gas Plasmas II", R. W. Clark and J. Davis, Physics of Fluids B, 2(7), 1698, 1990

"Stability of a Z Pinch at the Pease-Braginskii Current", F. L. Cochran, A. E. Robson, Physics of Fluids B, 2(9), 2270, 1990.

"Scaling of Dielectronic-Recombination Data in Fluorinelike Ions", A. Dasgupta, K. G. Whitney, Physical Review A, 42, 2640, 1990.

"A New Procedure for Analyzing X-Ray Spectra from Laboratory Plasmas", M. C. Coulter, K. G. Whitney, J. W. Thornhill, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, 443, 1990.

"Absolute Intensity of a Sodium-Like Resonance Line for Temperature Diagnosis of Neon-Like X-ray Laser Plasmas", M. C. Coulter, J. P. Apruzese, K. G. Whitney Applied of Physics B, 50, 193, 1990.

"Radius Scaling Effects in Nickel Wire Array Z-Pinches", C. Deeney, T. Nash, P. D. Lepell, K. Childers, M. Krishnan, K. G. Whitney, J. W. Thornhill, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, 457, 1990.

"X-Pinch Wire Load Experiments on Blackjack5", N. Loter, M. Gersten, R. Grandey, M. Coulter, J. Davis, K. Whitney, Journal of Quantitative Spectroscopy and Radiation Transfer, 44, 507, 1990.

"Efficient Generation of Multigigawatt Rf Power by a Klystronlike Amplifier", M. Friedman, J. Krall, Y. Y. Lau, and V. Serlin, Review of Scientific Instruments, 61, 171, 1990.

"Efficient Second Harmonic Conversion of Broad-Band High-Peak-Power Nd: Glass Laser Radiation Using Large-Aperture KDP Crystals in Quadrature", M. S. Pronko, R. H. Lehmer.g, S. Obenschain, C. J. Pawley, C. K. Manka, R. Eckardt, IEEE Journal of Quantum Electronics, 26, 337, 1990

"Time-Resolved, Simultaneous Density, Temperature, and Absorption Measurements in Dense Laser-Produced Plasmas", K.J. Kearney, A. N. Mostovych, and J. A. Stamper, Review of Scientific Instruments, 61, 3596, 1990.

"Efficient Second Harmonic Conversion of Broad-Band High-Peak-Power Nd: Glass Laser Radiation Using Large-Aperture KDP Crystals in Quadrature", M. S. Pronko, R. H. Lehmberg,

S. Obenschain, C. J. Pawley, C. K. Manka, R. Eckardt, IEEE Journal of Quantum Electronics, 26, 2, 1990.

"Neutron Measurements on ZFX", K. A. Gerber and J. D. Sethian, Review of Scientific Instruments, 61, 3169, 1990.

"Theory of Magnetically Insulated Electron Flows in Coaxial Pulsed Power Transmission Lines", R. I. Lawconnell, J. M. Neri, Physics of Fluids B, 2, 629, 1990.

"Soft X-Ray Material-Response Simulation with Intense Light-Ion Beams", S. H. Richter, L. M. Lee, D. V. Keller, D. Mosher, S. J. Stephanakis, F. C. Young, Journal of Radiation Effects, Research & Engineering, 9, 252, 1990.

"Quantitative X-ray Spectroscopy of Sodium Z-Pinch Plasma for Na/Ne Photopumping", P. G. Burkhalter, G. Mehlman, J. P. Apruzese, D. A. Newman, V. E. Scherrer, F. C. Young, S. J. Stephanakis, D. D. Hinshelwood  
Journal of Quantitative Spectroscopy and Radiation Transfer, 44, 495, 1990.

"High-Fluence Large-Area MeV Proton-Beam Diagnostics", F. C. Young, S. J. Stephanakis, V. E. Scherrer, D. Mosher, S. H. Richter, Review of Scientific Instruments, 61, 3122, 1990.

"Differential Memory in the Trilinear Model Magnetotail", J. Chen, H. G. Mitchell, P. J. Palmadesso  
Journal of Geophysical Research, 95, 15141, 1990.

"Fractal Boundaries in Magnetotail Particle Dynamics", J. Chen, J. L. Rexford, Y. C. Lee,  
Geophysical Research Letters, 17, 1049, 1990.

"Equilibrium of Solar Coronal Arcades", J. M. Finn, J. Chen, The Astrophysical Journal, 349, 345, 1990.

"Magnetic Reconnection in Collisionless Plasmas: Prescribed Fields", G. R. Burkhart, J. F. Drake, J. Chen  
Journal of Geophysical Research, 95, 18833, 1990.

"Observational Signatures of Nonlinear Magnetotail Particle Dynamics", J. Chen, G. R. Burkhart, C. Y. Huang  
Geophysical Research Letters, 17, 2237, 1990.

"Plasma Instabilities in the High-Latitude E Region Induced by High-Power Radio Waves", P. K. Chaturvedi, S. L. Ossakow, Journal of Geophysical Research, 95, 15185, 1990.

"Simulation of Electrostatic Turbulence Due to Sheared Flows Parallel and Transverse to the Magnetic Field", K. I. Nishikawa, G. Ganguli, Y. C. Lee, P. J. Palmadesso, Journal of Geophysical Research, 95, 1029, 1990.

"Equilibrium Structure of the Plasma Sheet Boundary Layer-Lobe Interface", H. Romero, G. Ganguli, P. Palmadesso, P. B. Dusenbery, Geophysical Research Letters, 17, 2313, 1990.

"Scaling Laws for the Spectrum of Interchange Instabilities in the High-Latitude Ionosphere", M. J. Keskinen  
Journal of Geophysical Research, 95, 19137, 1990.

"Nonlinear Evolution of High-Latitude Ionospheric Interchange Instabilities with Scale-Size-Dependent Magnetospheric Coupling", M. J. Keskinen, J. D. Huba, Journal of Geophysical Research, 95, 15157, 1990

"Universal Interchange Instability in Partially Ionized Gases", J. D. Huba, Physics of Fluids B, 2(11), 2547, 1990.

"Stability of Sub-Alfvénic Plasma Expansions", J. D. Huba, A. B. Hassam, D. Winske, Physics of Fluids B, 2(7), 1676, 1990.

"Nonlinear Evolution of the Unmagnetized Ion Rayleigh-Taylor Instability", A. B. Hassam, J. D. Huba  
Physics of Fluids B, 2(9), 2001, 1990.

"Three-Dimensional Simulation Study of Ionospheric Plasma Clouds", S. T. Zalesak, J. F. Drake, J. D. Huba  
Geophysical Research Letters, 17, 1597, 1990.

"Comment on "Interaction of Electromagnetic Waves in the Ionosphere", by V. N. Laxmi and A. K. Saha"  
P. A. Bernhardt, S. T. Zalesak, F. T. Djuth, Radio Science, 25, 85, 1990.

"Artificial Ion Beam Instabilities 1. Linear Theory", W. A. Scales, P. M. Kintner, Journal of Geophysical Research, 95, 10623, 1990.

"The Measurement of Vacuum-UV Line Intensities for Neon-Like Ions Generated in a -Pinch Device", R. C. Elton, R. U. Datla, J. R. Roberts, A. K. Bhatia, Physica Scripta, 41, 440, 1990.

"Characterisation of Soft X-ray Amplification Observed in Ne-Like Germanium", D. M. O'Neill, C. L. S. Lewis, D. Neely, J. Uhomoiibhi, M. H. Key, A. MacPhee, G. J. Tallents, S. A. Ramsden, A. Rogoyski, E. A. Mclean, G. J. Pert, Optics Communications, 75, 406, 1990.

"Techniques for Soft X-ray Absorption in Laser-Produced Plasmas", P. G. Burkhalter, G. Mehlman, D. A. Newman, B. H. Ripin, Review of Science Instruments 61(10), 2741, 1990.

"Laboratory Laser-Produced Astrophysical-Like Plasmas", B. H. Ripin, C. K. Manka, T. A. Peyser, E. A. McLean, J. A. Stamper, A. N. Mostovych, J. Grun, K. Kearney, J. R. Crawford, J. D. Huba, Laser and Particle Beams, 8, 1, 183, 1990,

"Artificial Ion Beam Instabilities 2. Simulations", W. A. Scales, P. M. Kintner, Journal of Geophysical Research, 95, 10643, 1990.

"Quasilinear Theory of Radiation Saturation in a Free-Electron Laser", W. P. Marable, P. A. Sprangle  
Journal of Applied Physics, 67(8), 3576, 1990.

"Relativistic Klystron Amplifiers Driven by Modulated Intense Relativistic Electron Beam", Y. Y. Lau, M. Friedman, J. Krall, V. Serlin, IEEE Transactions on Plasma Science, 18, 1990.

"Illumination Uniformity of Spherical Targets Using Kilojoule-Scale Lasers With Optical Smoothing", D. G. Colombant, A. J. Schmitt, Applied Physics, 67, 2303, 1990.

"Nonlinear Beam Loading and Dynamical Limiting Currents in a High-Power Microwave Gap", D. G. Colombant, Y. Y. Lau, Physical Review Letters, 64, 2320, 1990.

"Frequency Shifts Induced in Laser Pulses by Plasma Waves", E. Esarey, A. Ting, P. Sprangle, Physical Review A, 42, 3526, 1990.

"Vlasov Theory of Wiggler Field Errors and Radiation Growth in a Free-Electron Laser", W. P. Marable, E. Esarey, C. M. Tang, Physical Review A, 42, 3006, 1990.

"Electron Beam Propagation Through a Magnetic Wiggler", E. Esarey, A. Ting, Physical Review Letters, 65, 1961, 1990.

"Radiation Guiding and Efficiency Enhancement in the Cyclotron Autoresonance Maser", R. G. Kleva, B. Levush, P. Sprangle, Physics of Fluids B, 2(1), 185, 1990.

"Nonlinear Interaction of Intense Laser Pulses in Plasmas", P. Sprangle, E. Esarey, A. Ting, Physical Review A, 41, 4463, 1990.

"Nonlinear Theory of Intense Laser-Plasma Interactions", P. Sprangle, E. Esarey, A. Ting, Physical Review Letters, 64, 2011, 1990.

"Efficiency Enhancement and Optical Guiding in a Tapered High-Power Finite-Pulse Free-Electron Laser", B. Hafizi, A. Ting, P. Sprangle, C. M. Tang, Physical Review Letters, 64, 180, 1990.

"Synchrotron-Betatron Parametric Instability in Free-Electron Lasers", B. Hafizi, A. Ting, Physical Review A, 41, 2877, 1990.

"Nonlinear Wake-Field Generation and Relativistic Focusing of Intense Laser Pulses in Plasmas", A. Ting, E. Esarey, P. Sprangle, Physics of Fluids B, 2(6), 1390, 1990.

"High-Energy Electron Beam Deposition and Plasma Velocity Distribution in Partially Ionized N<sub>2</sub>", S. P. Slinker, A. W. Ali, R. D. Taylor, Journal of Applied Physics, 67(2), 679, 1990.

"Megavolt, Multikiloamp K<sub>α</sub> Band Gyrotron Oscillator Experiment", W. M. Black, S. H. Gold, A. W. Fliflet, D. A. Kirkpatrick, W. M. Manheimer, R. C. Lee, V. L. Granatstein, D. L. Hardesty, A. K. Kinkead, M. Suci, Physics of Fluids B, 2(1), 193, 1990.

"Measurement of Plasma-Neutralized Super-Vacuum Currents in a Gyrotron Configuration", D. A. Kirkpatrick, S. H. Gold, W. M. Manheimer, W. M. Black, A. K. Kinkead, D. L. Hardesty, Applied Physics Letters, 57(5), 437, 1990.

"Millimeter-Wave Gyrokystron Amplifier Experiment Using a Relativistic Electron Beam", S. H. Gold, A. W. Fliflet, W. M. Manheimer, D. A. Kirkpatrick, W. Murray Black, A. K. Kinkead, D. L. Hardesty, M. S. Suci, IEEE Transactions on Plasma Science, 18, 1021, 1990.

"Improved Beam Confinement in the Modified Betatron with Strong Focusing", C. A. Kapetanacos, L. K. Len, T. Smith, J. Golden, K. Smith, S. J. Marsh, D. Dialetis, J. Mathew, P. Loschialpo, J. H. Chang, Physical Review Letters, 64, 2374, 1990.

"Review of Quasi-Optical Gyrotron Development", A. W. Fliflet, T. A. Hargreaves, R. P. Fischer, W. M. Manheimer, P. Sprangle, Journal of Fusion Energy, 9, 31, 1990.

"Design Principles for a Sheet-Beam Electron Gun for a Quasi-Optical Gyrotron", W. M. Manheimer, A. W. Fliflet, R. Lee, IEEE Transactions on Electron Devices, 37, 840, 1990.

"Initial Operation of a High-Power Quasi-Optical Gyrotron", A. W. Fliflet, T. A. Hargreaves, W. M. Manheimer, R. P. Fischer, M. L. Barsanti, IEEE Transactions on Plasma Science, 18, 306, 1990.

"Operating Characteristics of a Continuous-Wave-Relevant Quasioptical Gyrotron with Variable Mirror Separation", A. W. Fliflet, T. A. Hargreaves, W. M. Manheimer, R. P. Fischer, M. L. Barsanti, B. Levush, T. Antonsen, Physics of Fluids B 2(5), 1046, 1990.

"Foil Focusing of Electron Beams", R. F. Fernsler, R. F. Hubbard, S. P. Slinker, Journal of Applied Physics, 68(12), 5985, 1990.

"Electron-Beam Quality in Free-Electron Lasers", C. W. Roberson, B. Hafizi, Nuclear Instruments and Methods in Physics Research A, 296, 477, 1990.

"The Impact of Field-Error Reduction Techniques on FEL Performance", W. P. Marable, E. Esarey, C. M. Tang, Nuclear Instruments and Methods in Physics Research A, 296, 499, 1990.

"Effect of Tapering on Optical Guiding and Sideband Growth in a Finite-Pulse Free-Electron Laser", B. Hafizi, A. Ting, P. Sprangle, C. M. Tang, Nuclear Instruments and Methods in Physics Research A, 296, 442, 1990.

"The Effects of Wiggler Errors on Free-Electron-Laser Performance", E. Esarey, W. Marable, C. M. Tang, Nuclear Instruments and Methods in Physics Research A, 296, 423, 1990.

"Synchrotron-Betatron Parametric Instability in Free-Electron Lasers", B. Hafizi, A. Ting, Nuclear Instruments and Methods in Physics Research A, 296, 468, 1990.

"The NIST-NRL Free-Electron-Laser Facility", R. G. Johnson, R. L. Ayres, J. B. Broberg, R. I. Cutler, P. H. Debenham, B. C. Johnson, E. R. Lindstrom, D. L. Mohr, J. E. Rose, J. K. Whittaker, N. D. Wilkin, M. A. Wilson, S. Penner, C. M. Tang, P. Sprangle, Nuclear Instruments and Methods in Physics Research A, 296, 25, 1990.

"High-Power Free-Electron Lasers Driven by RF Linear Accelerators", T. F. Godlove, P. Sprangle, Particle Accelerators, 34, 169, 1990.

"An Equation for Acoustic Propagation in Inhomogeneous Media with Relaxation Losses", Adrian I. Nachman, James F. Smith, III, and Robert C. Waag, J. Acoust. Soc. Am.; 88 (3), 1584-95, (1990).

"Acoustic Source-Level Measurements for a variety of Merchant Ships", Paul Scrimger and Richard Heitmeyer, J. Acoustic Society of America, December 1990.

"Another interpretation and derivation of one-way wave theories", J.J. McCoy and S.C. Wales, Wave Motion 12(3), 227-244, May 1990.

"Detection Performance of Harmonic-Correlation Processing", E.L. Kunz, A.A. Gerlach, K.D. Flowers, and W.L. Anderson, U.S. Navy Journal of Underwater Acoustics, 40(2) April 1990.



"Effectiveness of mode filtering: a comparison of matched-field and matched-mode processing", T. C. Yang, J. Acoust. Soc. Am., 87, 2072-2084, (1990).

"Modal shading coefficients for high resolution source depth localization", T. C. Yang, J. Acoust. Soc. Am. 87, 668-672 (1990).

"Analysis of backscattering data in the Tyrrhenian Sea", J.R. Preston, T. Akal, and J.M. Berkson, J. Acoust. Soc. Am., vol. 87 (1), p. 119-134, January, 1990.

"Line and plane arrays of resonant monopole scatterers", I. Tolstoy and A. Tolstoy, J. Acoust. Soc. Am. 87 (3) p. 1038-1043, 1990.

"Line source solution for the wedge with pressure-release boundaries (benchmark problem 1)", M. Buckingham and A. Tolstoy, J. Acoust. Soc. Am. 87 (4) p.1511-1513, 1990.

"An Over-relaxation Method for the Iterative Solution of Integral Equations in Scattering Problems", R.E. Kleinman, G.F. Roach, L.S. Schuetz, J. Shirron, and P.M. Van den Berg, Wave Motion 12, 161-170, 1990.

"Conformal Generalized Nearfield Acoustic Holography for Axisymmetric Geometries", Giorgio V. Borgiotti, Angie Sarkissian, Earl Williams, and Luise Schuetz, J. Acoust. Soc. Am. 88(1), July 1990.

"A new integral equation formulation for an axisymmetric structure", A. Sarkissian, J. Acoust. Soc. Am. 88, 961-966, 1990.

"The relationship of singular value decomposition to wave-vector filtering in sound radiation problems", D. M. Photiadis, J. Acoust. Soc. Am. 88 (2), p.1152, August 1990.

"The propagation of axisymmetric waves on a fluid-loaded cylindrical shell", D. M. Photiadis, J. Acoust. Soc. Am. 88, (1), p 234, July 1990.

"A Poynting vector formulation for this shells and plates, and its application to structural intensity analysis and source localization. PART 1: Theory", Anthony Romano, Phil Abraham, & Earl G. Williams, J. Acoust. Soc. Am., 87, 1166-1175, 1990.

"Experimental investigation of the wave propagation on a point-driven, submerged capped cylinder using k-space analysis", Earl G. Williams, Brian Houston, & J. A. Bucaro, J. Acoust. Soc. Am., 87, 513-522, 1990.

"Far-field holography applied to an arbitrary geometry", A. Sarkissian, J. Acoust. Soc. Am. 90, 2359 (1991)

"Visualization of acoustic scattering from a submerged sphere," Charles F. Gaumont Louis R. Dragonette, and Lawrence C. Schuette, J. Acoust. Soc. Am 87 S43, 1990.

"In-plane acoustic scattering measurements at NRL", Brian H. Houston, Charles F. Gaumont, Lawrence C. Schuette, Louis R. Dragonette, and Michael L. Saniga, J. Acoust. Soc. Am. 87 S43, 1990.

"Comparisons of backscattering from cylindrical shells described by shell and elasticity theories", Ronald P. Radlinski, Richard D. Vogel song, and Louis R. Dragonette, J. Acoust. Soc. Am. S18 88, 1990.

- "Form Function dependence at low  $ka$ ", Louis R. Dragonette, and Charles F. Gaumont, J. Acoust. Soc. Am. S15, 88, 1990.
- "Optimal Time-Domain Beamforming with Simulated Annealing Including Application of a priority Information", W.A. Kuperman, M.D. Collins, J.S. Perkins, and N.R. David, J. Acoust. Soc. Am.; 88, pp. 1802-1810, 1990.
- "Interaction of Weak Shocks with a Simple Fluid - Fluid Interface: Numerical Simulation", B.E. McDonald, W.A. Kuperman, J. Acoust. Soc. Am.; 87, S21, 1990.
- "Nonlinear Propagation in an Ocean Waveguide", J.J. Ambrosiano, D.R. Plante, B.E. McDonald, W.A. Kuperman, J. Acoust. Soc. Am.; 87, pp. 1473-1481, 1990.
- "Environmental Signal Processing: Three-Dimensional Matched Field with a Vertical Array", J.S. Perkins and W.A. Kuperman, " J. Acoust. Soc. Am.; 87, pp. 1553-56, 1990.
- "Environmental Tolerant Beamforming for High Resolution Matched Field Processing", H. Schmidt, A.B. Baggeroer, W.A. Kuperman, E.K. Sheer, J. Acoust. Soc. Am.; 88, pp. 1851-1862, 1990.
- "Sensitive VLA Observation of OH 127.8 - 0.0 and OH 26.5 + 0.6", P.F. Bowers, K.J. Johnston, ApJ, 354, 676, 1990.
- "A Fringe Counting System for Control of a Fabry-Perot Spectrometer", C. Forden, W. Glaccum, J. Fischer, H.A. Smith, "Optical Engineering, p. 29, 1143, 1990.
- "The Timing Properties of PSR 1951+32 Supernova Remnant CTB 80", R.S. Foster, D.C. Backer & A. Wolszczan, ApJ, p. 356, p. 243, 1990.
- "Constructing a Pulsar Timing Array", R.S. Foster, D.C. Backer, ApJ, p. 361, p. 300, 1990.
- "Interstellar Propagation Effects and the Precision of Pulsar Timing", R.S. Foster, M.J. Cordes, ApJ, 364, 123, 1990.
- "The Sgr B2 Star Forming Region: Subarcsecond Radio spectral Line and Continuum Observations", R.A. Gaume, M. Claussen, ApJ 351, p. 538, 1990.
- "Observations of 40-70 Micron Bands of Ice in IRAS 09371 + 1212 and Other Stars", A. Omont, T. Gorveille, S.H. Moseley, W. Glaccum, P.M. Harvey, L. Kikkell, R.F. Lowenstein, C.M. Lisse ApJ, p. 355, p. 270, 1990.
- "W30 Revealed: Improved Estimates of Physical Properties of the W30 Thermal and Nonthermal Components from 90 cm VLA Observations", N.E. Kassim, K.W. Weiler, Astrophys. J., p. 360, p. 184, 1990.
- "A Possible New SNR/PSR Association", N.E. Kassim, K.W. Weiler, Nature, 343, 146, [Selected as cover article] 1990.
- "Structure in Small Molecular Clouds: Pedestals and Clumping", L. Magnani, J.M. Carpenter, L. Blitz, N.E. Kassim, B.B. Nath, Astrophys. J. Suppl., p. 73, p. 747, 1990.
- "Meter-Decameter Observations of dMe Flare Stars with the Clark Lake Radio Telescope", P.D. Jackson, M.R. Kundu, N.E. Kassim, Solar Phys., p. 130, p. 391, 1990.

"Apparent Orbit of the Spectroscopic Binary Beta Arietis with the Time Mark III Stellar Interferometer", X. Pan, M. Shao, M.M. Colavita, D. Mozurkewich, R. Simon, ApJ, p. 356, p. 641, 1990.

"CO (J = 2 - 1) Study of Molecular Clouds in the Southwest Arm of M31", M.L. Kutner, F. Verter, L.J. Rickard, ApJ, p. 365, p. 195, 1990.

"43 GHz-VLBI Observations of 3C273 After A Flux Density Outburst in 1988", T.P. Kirchbaum, R.S. Booth, A.J. Krus, B.O. Ronnang, A. Witzel, D.A. Graham, I.I.K. Pauliny-Toth, A. Quirrenbach, C.A. Hummel, A.L. Alberdi, J.A. Zensus, K.J. Johnston, J.H. Spencer, A.E.E. Rogers, C.R. Lawrence, A.C.S. Readhead, H.Hirabayashi, M. Inoue, M.Morimoto, V. Dhawan, N. Bartel, I.I. Shapiro, B.F. Burke, J.M. Marcaide, A&A, p. 237, pp. 3-11, 1990.

"Further 7 Millimeter Observations of 3C84 and Other Sources with 100 Microsecond Angular Resolution", V. Dhawan, N. Bartel, A.E.E. Rogers, T.P. Kirchbaum, A. Witzel, D.A. Graham, I.I.K. Pauliny-Toth, B.O. Ronnang, H.Hirabayashi, M. Inoue, C.R. Lawrence, I.I. Shapiro, B.F. Burke, R.S. Booth, A.C.S. Readhead, M. Morimoto, K.J. Johnston, J.H. Spencer, J.M. Marcaide, ApJ, 360, L43, 1990.

"Galaxy Mass Deduced from the Structure of Einstein Ring MG1654+1346", G.I. Langston, S.R. Conner, J. Lehar, B.F. Burke, K.W. Weiler, (Cover Article), Nature 344, 43, 1990.

"Radio Emission from Supernovae: II SN1986J -- A Different Kind of Type II", K.W. Weiler, N. Panagia, R.A. Sramek, Astrophys. J., 364, 611, 1990.

"High Spectral Resolution Observations and Kinematic Modeling of the 1667 MHz Hyperfine Transition of OH in Comets Halley (1982i), Giacobini-Zinner (1984e), Hartley-Good (19851), thiele (1985m), and Wilson (19861)", L.E. Taxxon-Garman, F.P. Schloerb, M.J. Claussen, ApJ, 364, 672, 1990.

"The Circumstellar Environment of the Emission-Line Star LkH-alpha 101", M. Barsony, N.Z. Schombert, M.J. Claussen, ApJ, 362, 674, 1990.

"The Second MIT-Green Bank 5 GHz Survey", G. Langston, M. Heflin, S. Conner, J. Lehar, C. Carrilli, ApJ, 72, 621, 1990.

"Faint Radio Sources and Gravitational Lensing", G. Langston, S. Conner, M. Heflin, J. Lehar, B. Burke, ApJ, 353, p. 34, 1990.

"Accuracy of Binary Star Separations Estimated from Interferometer Data", M. Vivekanand, AJ, 100, 2047, 1990.

"Multiwavelength Observations of Two B-Star Nurseries - DR 5 and DR 20", S. Odenwald, M.F. Campbell, K. Shivanandan, P.R. Schwartz, G.G. Fazio, H. Moseley, AJ, p. 99, p. 288, 1990.

"SSM/I Imagery of Tropical Cyclones", G. Sandlin IGARRS, May 1990.

"World View from SSM/I at 85.5 GHz", G. Sandlin, cover imagery for IEEE Special issue of Geoscience and Remote Sensing, Vol. 28, No. 5, 1990.

"Passive Pressure-Drag Control in a Plane Wake", F.F. Grinstein, J.P. Boris and O.M. Griffin, AIAA Journal, Vol. 28, pp. 1436-1442, 1991.

"Modification of Directional Wave Number Spectra by Currents in the Wake of a Surface Ship", R.A. Skop, O.M. Griffin and Y. Leipold, *Journal of Ship Research*, Vol. 34, pp. 69-79, March 1990.

"Vortex Shedding and Lock-On in Bluff Body Wakes", O.M. Griffin and M.S. Hall, *International Symposium on Unsteady Flows Proceedings*, ASME FED Vol. 92, ASME: New York, 209-218, June 1990.\*

"Hydrodynamics of Remotely Sensed Surface Ship Wakes", A.M. Reed, O.M. Griffin, R.D. Peltzer and R.F. Beck, *Transactions of SNAME*, Vol 98, pp. 319-363, 1990.

"Pseudo-Steady Diffusional Growth or Collapse of Bubbles Rising in Time Dependent Pressure Fields", M. Cerza, M.B. Stewart and O.M. Griffin, *Advances in Gas-Liquid Flows-1990*, FED Vol 99, ASME: New York, 217-240, Dec 1990.

"Coherent Structure Dynamics in Spatially Evolving Bluff-Body Wake Flows", F.F. Grinstein, J.P. Boris, F. Hussain, E.S. Oran and O.M. Griffin, *AIAA Paper 89-0507*, AIAA 28th Aerospace Sciences Meeting, Reno, Nevada, Jan. 1990.

"Direct Calculation of the Interaction Between Subsurface Vortices and Surface Contaminants", H.T. Wang and R.I. Leighton, *Proceedings of the 1990 Conference on Offshore Mechanics and Arctic Engineering (OMAE)*, Vol. I-A, Feb. 1990.\*

"Recent Japanese Research on Ocean Wave-Structure Interactions", H.T. Wang, *ONR Far East Scientific Information Bulletin*, Vol. 15, No. 2, April/June 1990, pp. 45-55.

"Three-Dimensional Vortex Interactions with a Free Surface", H.T. Wang and R. I. Leighton, *Symposium on Advances and Applications in Computational Fluid Dynamics*, ASME Winter Annual Meeting, Vol. FED-103, November 1990, pp. 213-222.

"The seasonal variation of water vapor and ozone in the upper mesosphere: implications for vertical transport and ozone photochemistry", Bevilacqua, R.M., D.F. Strobel, M.E. Summers, J.J. Olivero, and M. Allen, *J. Geophys. Res.*, 95, pp. 883-893, 1990.

"A model study of the response of mesospheric ozone to short-term solar ultraviolet flux variation", Summers, M.E., D.F. Strobel, R.M. Bevilacqua, X. Zhu, M.T. DeLand, M. Allen, and G.M. Keating, *J. Geophys. Res.*, 95, 22523-22538, 1990.

"Design Parameters for an Infrared Surveillance System", J. Michalowicz, J. Kershenstein, T. Giallorenzi, R. Lucke, M. McHugh, E. Stone, J. Hornstein, A. Schaum, *classified NRL Report 9302*, 5 December 1990.

"Adsorption-Induced Relaxation of Ni(001)-c(2x2)-O", S.R. Chubb, P.M. Marcus, K. Heinz, K. Muller, *Physical Review B*, vol 41, nbr 8, pp. 5417-5419, 15 March 1990.

"Measurements of Sea Spikes in Microwave Backscatter at Moderate Incidence", A.T. Jessup, W.C. Keller, W.K. Melville; *Journal of Geophysical Research*, vol 95, no. C6, pp. 9679-9688, 15 June 1990.

"Bloch-Symmetric Fusion In PdD<sub>x</sub>", T.A. Chubb, & S.R. Chubb; *Fusion Technology*, vol 17, pp 710-712, July 1990.

"Coastline Detection and Tracing in SAR Images", J.S. Lee, I. Jurkevich; IEEE Trans. on Geoscience and Remote Sensing, vol 28, no. 4, pp. 662-668, July 1990.

"95 GHz Short Pulse Radar", E.A. Uliana, B. Yaplee, Chu and Newkirk, IEEE Trans. on Geoscience and Remote Sensing, vol. 28, no. 4, pp. 729-731, July 1990.

"Evidence of Bragg Scattering in Microwave Doppler Spectra of Sea Return", W.J. Plant, W.C. Keller; Journal of Geophysical Research, vol 95, no. C9, pp 16, 299-16,310, 15 September 1990.

"Cross Sections and Modulation Transfer Functions at L and K<sub>u</sub> Bands Measured During the Tower Ocean Wave and Radar Dependence Experiment", W.C. Keller, W.J. Plant; Journal of Geophysical Research, vol 95, no. C9, pp 16,277-16,289, 15 September 1990.

"Focusing Simulations of SAR Ocean Images", Hoyt, DeWitt, Henyey, Koslingham, W.C. Keller, D.R. Lyzenga W.J. Plant, Shemdin and Wright, JGR Oceans, 15 September 1990.

"Surface Waves and Fluxes", G.L. Geernaert and W.J. Plant, Vols 1&2, eds., Kluwer Academic Publishers, The Netherlands, 1990.

"Bulk Parameterizations for the Wind Stress and Heat Fluxes", Geernaert and Plant, G.L. Geernaert, in Surface Waves and Fluxes, 1, eds. pp. 92-173, 1990.

"Bragg Scattering of Electromagnetic Waves from the Air/Sea Interface", Geernaert and Plant, W.J. Plant, in Surface Waves and Fluxes, 2, eds. pp. 41-108, 1990 vol 17, pp. 710-712, July 1990.

"Production of Laser Radiation in Aligned Crystal Targets", R.Fusina, Journal of the Optical Society of America B/Vol. 7, No. 10, pp. 2076-2078, October 1990.

"Theoretical Study of Native Defects and Impurities in InP", R.W. Jansen, Phys. Rev. B., 41, 7666, 1990.

"Fram Strait satellite-derived ice motions", Emery, W.J., C.W. Fowler, J. Hawkins, and R.H. Preller, J. Geophys. Res., 96, 4731-4768. 1991.

"A comparison of observed and modelled sea surface topographic time series near the New England Seamounts", Hallock, Z.R., W.J. Teague, and J.D. Thompson, J. Geophys. Res. 96 (C7), 12, pp. 12635-12644. 1991.

"Synthetic temperature profiles derived from GEOSAT altimetry: Comparison with air-dropped expendable bathythermograph profiles", Carnes, M.R., J.L. Mitchell, and P.W. deWitt, J. Geophys. Res., 95,17979-17992. 1990,

"Variations in the Structure of the Anticyclonic Gyres found in the Alboran Sea", Heburn, G.W. and P. LaViolette, J. GEOPHYSICAL RESEARCH, p. 95, pp. 1599-1613. 1990.

"Statistical inference of weakly correlated subthermocline fields from satellite altimeter data", Hurlburt, H.E., D.N. Fox, and E.J. Metzger, J. Geophys. Res. - Oceans, p. 95, pp. 11375-11409. 1990.

"Mean sea surface and variability of the Gulf of Mexico using GEOSAT altimetry data: A new marine geoid for the Gulf of Mexico", Leben, R.R., G.H. Born, and J.D. Thompson, *J. Geophys. Res.*, 95, pp. 3025-3032. (Special GEOSAT issue). 1990.

"The estimation of geoid profiles in the NW Atlantic from simultaneous satellite altimetry and AXBT sections", Mitchell, J.L., J.M. Dastugue, W.J. Teague, and Z.R. Hallock, *J. Geophys. Res.*, 95 (C10). 1990.

"Predictions and studies with a one-dimensional ice-ocean model", Riedlinger, S.H. and A. Warn-Varnas, *J. Phys. Oceano.*, p. 20, pp. 1545-1562. 1990.

"Sea ice concentrations in the Canada basin during 1988: Comparisons with other years and evidence of multiple forcing mechanisms", Serreze, M.C., J.A. Maslanik, R.H. Preller, and R.G. Barry, *J. Geophys. Res.*, 95, 1990.

"Origins of the Algerian Current", Arnone, R.A., D.A. Wisenbarg and K.D. Saunders. *J. Geophys. Res.*, 95(C2), pp. 1587-1598. 1990.

Sun-Glitter Photographs of Georges Bank and the Gulf of Maine from the Space Shuttle", LaViolette, P.E., D.R. Johnson and D.A. Brooks. *Oceanography*, 3, pp. 43-49. 1990.

"Microbial Corrosion", Little, B.J., P. Wagner, W. Lee and W.G. Characklis Chapter in book, *Biofilms*, W.G. Characklis and K.C. Marshall (eds), John Wiley and Sons, Inc., pp. 635-670. 1990.

"Mackinawite Formation During Microbial Corrosion.", Little, B.J. -(with) M.B. McNeil, *Corrosion*, 46(7), pp 599-600. 1990.

"Microbiologically Influenced Corrosion in Copper and Nickel Seawater Piping Systems", Little, Brenda, Patricia Wagner and Richard Ray, *J. Mar. Tech. Soc.*, 24(3), pp. 10-17. 1990.

"Corrosion Mechanisms for Copper and Silver Objects in Near Surface Environments", Little, Brenda J. and M.B. McNeil, JAIC published. 1990.

"Composition Variations in Copper Nickel Butt Welds", Little, Brenda and P.A. Wagner, *J. of Corrosion* (vo 47, no 8, pp645-652), 1990.

"Biofilm Formation on Metal Surfaces in Antarctic Waters. Biofouling", Little, B.J. - (with) J.S. Maki and R. Mitchell, *J. of Mar. Res.*, 2, pp. 27-28. 1990.

"The Estimation of Geoid Profiles in the Northwest Atlantic From Simultaneous Satellite Altimetry and Airborne Expendable Bathythermograph Sections", Mitchell, Jim L., Jan M. Dastugue, William J. Teague and Zachariah R. Hallock, *J. of Geophys. Res.*, 95(C10), pp. 17,965-17,977. October 1990.

"A Field Evaluation of New Satellite-Tracked Buoys: A Loran-C Position Recording and a Sonobuoy Type Drifter", Pickett, Robert and Michael McCormick, *Marine Technology Society*. 1990.

"A Comparison Between the Generalized Digital Environmental Model and Levitus Climatologies", Teague, William J., Michael J. Carron and Patrick J. Hogan, *J. of Geophys. Res.* 95(C5), pp. 7167-7183, May 15, 1990.

"Gulf Stream Path Analysis Near the New England Seamounts", Teague, William J. and Zachariah R. Hallock, J. of Geophys. Res. 95(C2), pp1647-1662. 1990.

"A Comparison Between the Generalized Digital Environmental Model and Levitus Climatologies", Teague, W.J., M.J. Carron, and P. Hogan, J. Geophys. Res. 95, pp. 7167-7183. 1990.

"Using an Electric Circuit Simulator to Analyze Nonlinear Vibration", Russo, E. and Trahan, R., Journal of Sound and Vibration", June 1990.

"Implementation of an Oceanographic System", Romalewski, R., Problem, Feedback, Solutions," IEE SOUTHEASTCON 90, New Orleans, LA, April 1990.

"Trends in Expert Systems", Holland, C. R., 1990.

"Managing Large Scale Knowledge Bases", Nation, Emmet, IEEE SOUTHEASTCON 90, New Orleans, LA April 1990.

"A Hierarchical Artificial intelligence Maintenance Advisor", Moss, G., and Molnar, J., American Defense Preparedness Association Symposium on Artificial Intelligence, March 1990.

"GPS And Airborne Gravimetry: Recent Progress And Future Plans", Brozena, J.M., Proc. of Int. Symp. on Kinematic Systems in Geodesy, Surveying and Remote Sensing, Banff, Canada, Sept, 1990, Proceedings.\*

"The Fabric of a Consolidating Clayey Sediment Column", Bryant, W.R., R.H. Bennett, P.J. Burkett, And F.R. Rack, OPD Site 697, Proc. Ocean Drilling Program, Ocean Drilling Program Scientific Results, V. 113, p. 225-237, Proceedings. 1990.\*

"Continental Margins Of The Weddell Sea: Insights From Airborne Gravity And Geosat-Derived Gravity", Bell, R.E., J. M. Brozena, W.F. Haxby, and J.L. LaBrecque, Antarctic Res. Series, 50, 91-102, 1990.

"Airborne gravity measurement over sea-ice: the Western Weddell Sea", Brozena, J.M., J. LaBrecque, M. Peters, R. Bell and C. Raymond, Geophys. Res. Lett., 17, 1941-1944, 1990.

"Ridge jumps and propagations in the South Atlantic Ocean", Brozena, J.M., and R.S. White, Nature, 348, 149-152, 1990.

"Current Plate Motions", DeMets, C., R. Gordon, D.F. Argus, and S. Stein, Geophys. Int., 101, 425-478. 1990.

"Residual depth anomalies and the origin of the Australian-Antarctic discordance zone", Marks, K.M., P.R. Vogt, and S.A. Hall, J. Geophys. Res., 95, 17,325-17,337, 1990.

"Natural Gas Clathrates: Geoacoustic Inducement Of Low Bottom Loss", Max, M.D., 'Science and technology for a new oceans decade. V. III, Proc. Mar. Tech. Soc., Sept 26-28 1990, Washington DC 578-583, 1990.\*

"Terrane Assemblage Of The Leinster Massif, Se Ireland, During The Lower Palaeozoic", Max, M.D., A.J. Barber, and J. Martinez, J.Geol. Soc. London, 147, 1035-1050, 1990.

"Motion Of Iberia Since The Late Jurassic: Results From Detailed Aeromagnetic Measurements In The New-Foundland Basin. In Alpine Evolution Of Iberia And Its Continental Margins",

Srivastava, S.P., W.R. Roest, L.C. Kovacs, G. Oakey, S. Levesque, J. Verhoef, and R. MacNab, ed. by G. Boillot and J-M. Fontbote, *Tectonophysics*, 184, 229-260, 1990.

"Iberian Plate Kinematics: A Jumping Plate Boundary Between Eurasia And Africa", Srivastava, S.P., H. Schouten, W.R. Roest, K.D. Klitgord, L.C. Kovacs, J. Verhoef, and R.F. MacNab, *Nature*, 344, pp. 756-759, 1990.

"Prospecting For Active Volcanism: A Promising Role For Long-Range Aircraft Along The Mid-Oceanic Ridge", Vogt, P.R., C. Nishimura, and J. Jarvis, *EOS, Trans. AGU*, 71, 773-774, 1990.

"A Review Of The Middle Proterozoic Annagh Division Of Northwest County Mayo, Ireland: A Detached Fragment Of The Proterozoic North American Continent", Winchester, J.A., and M.D. Max, *Geol. Assoc. Canada Spec. Paper 38*, pp. 233-241, 1990.

"A Study Of Acoustic Scattering From Axially Symmetric Fluid-Loaded Elastic Solids With Ridges." M.F. Werby, *Journal of Wave Motion-Material Interaction*, March 1990.

"Resonance Scattering From Submerged Elastic Spheroids Of High Aspect Ratios And Its Three-Dimensional Interpretation," M.F. Werby and G.C. Gaunard, *JASA*, Volume 88, Number 2, August 1990.

"Acoustic Resonance Scattering By Submerged Elastic Shells," 1990 ASME Book No. AMR075, Volume 43, Number 8, August 1990.

"Acoustic Resonance Spectroscopy For Elastic Spheroids Of Varying Aspect Ratios And The Level Crossing Phenomenon," M. Werby, J. Castillo, A. Nagl, R. Miller, J. D'Archangelo, J. Dickey, and H. Uberall, *JASA*, Volume 88, Number 6, pp 2822-2829, December 1990.

"A Three-Dimensional Parabolic Equation Model That Includes The Effect Of Rough Boundaries," S.A. Chin-Bing (2nd) and M.D. Collins (1st), *JASA*, Volume 87, pp 1104-1109, 1990.

"Dipole Scattering And Background Mobility," M.F. Werby, *JASA*, Volume 87, pp 1582-1587, 1990.

"The Isolation Of Resonances And The Ideal Acoustical Background For Submerged Elastic Shells," M.F. Werby, *Acoustic Letter*, Volume 15, Number 3, pp 39-42, 1990.

"In Situ Porosity And Permeability Of Carbonate Sediment: Great Bahama Bank - Part I: Measurements", Bennett, R.H., H. Li, D.N. Lambert, K.M. Fischer, D.J. Walter, C.E. Hickox, T. Yamamoto, and M. Badiy, *Marine Geotechnology*, V. 9, No. 2, p. 1-28. 1990.

"Errata to Pre-Cretaceous Tectonic Evolution Of The Eastern Indian Ocean", Handschumacher, D.W., W.W. Sager, T.W. Hilde, And D.R. Bracey, *Tectonohpys.*, V. 176. 1990.

"Consolidation Related Fabric Changes of Periplatform Sediments", Rezak, R. and D. Lavoie, *Geo-Marine Letters*, V. 10, p. 101-109 . 1990.

"In Situ Porosity and Permeability of Selected Carbonate Sediment: Great Bahama Bank - Part II: Microfabric", Bennett, R.H., K.M. Fischer, H. Li, R. Baerwald M.H. Hulbert, T. Yamamoto, and M. Badiy, *Marine Geology*, V. 9, No. 1, p. 29-47. 1990.

"Calculation of Permeability of Selected Carbonate Sediments. Environmental Software", Fischer, K.M., H. Li, R.H. Bennett, and W.A. Dunlap, V. 5, No. 1, p. 29-37. 1990.



"In Situ Porosity And Permeability Of Selected Carbonate Sediment: Great Bahama Bank - Part I: Measurement", Bennett, R.H., H. Li, D.N. Lambert, K.M. Fischer, D.J. Walter, C.E. Hickox, M.H. Hulbert, T. Yamamoto, and M. Badiy, Marine Geotechnology, V. 9, No. 1, p. 1-28. 1990.

"Sediment Shear Wave: A Comparison on In Situ and Laboratory Measurements. Microstructure Of Fine Grained Sediments", Richardson, M.D., E. Muzi, L. Troiano, and B. Miaschi, Springer-Verlag, New York, Ch. 44, p. 403-415. 1990.

"Ascending and Descending Fluxes of Lipid Compounds in North Atlantic and North Pacific Abyssal Waters", Grimalt, J.O., B. Simonett, J.I. Gomez-Belinchon, K. Fischer, and J. Dymond, Nature 345, p. 147-150. 1990.

"Interannual and Seasonal Variation in the Western Mediterranean Circulation", Arnone, R.A., P.E. LaViolette, EOS, Trans. AGU, Vol. 71, No. 32, August 7, 1990.

"Acoustic Imaging of Biological and Physical Processes within Gulf Stream Meanders", Arnone, R.A., EOS, Trans. AGU, Vol. 71, No. 29, July 17, 1990.

"The Origin and Characteristics of the Algerian Current. The Journal of Geophysical Research", Arnone, R.A., Vol. 95, No. C2, February 1990.

"Viewing the World Navy Style", Breckenridge, J., J. Landrum, GIS World, 1, 1990.

"Airborne Stereo Multispectral Sensor (ASMSS): A Feasibility Study for the U.S. Navy", Estep, L., The Hydrographic Journal, No. 56, April, 1990.

"Air Bubbles Produced by Breaking Wind-Waves", Hsu, L., P. Hwang, Jin Wu, Journal of Physical Oceanography, Vol. 20, No. 1, January, 1990.

"Chlorophyll and Respiratory ETS Activity in microplankton from the Surface Waters of the Western Mediterranean", Martinez, R., R.A. Arnone, Z. Velasquez, Journal of Geophysics Res., C2, 1990.

"Shallow Water Bathymetry Models Using Multispectral Digital Data", Walker, C., T. Fay, K. Clark, Image & Technology, Vol. 16, No. 5, October, 1990.

"Dynamical Effects Of Annihilation In Pair-Dominated Winds", M. C. Begelman, P. A. Becker, Astrophysical Journal, Vol. 364, Pp. 203-211, November, 1990.

"On The Anomalous Abundances Of The  $2 \times 10^4 - 10^5$  K Solar Atmosphere Above A Sunspot", Feldman, Uri (Dr), Widing, Kenneth G.(Dr), P. A. Lund, Astrophysical Journal Letters, Vol. 364, Pp. L21-L23, November, 1990.

"The Beam Driven Chromospheric Evaporation Model Of Solar Flares: A Model Not Supported By Observations From Nonimpulsive Large Fla", Feldman, Uri (Dr), Astrophysical Journal, Vol. 364, Pp. 322-325, November, 1990.

"Four X-Ray Selected Cataclysmic Variables In The Galactic Plane", Hertz, Paul (Dr), C. D. Bailyn, H. Cohn, J. E. Grindlay, M. R. Garcia, P. M. Lugger, Astrophysical Journal, Vol. 364, Pp. 251-258, November, 1990

"Magnetic Flux Transport And The Sunspot-Cycle Evolution Of Coronal Holes And Their Wind Streams", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), Astrophysical Journal, Vol. 365, Pp. 372-386, December, 1990.

"Radio And X-Ray States In The X-Ray Binary Scorpius", Hertz, Paul (Dr), Wood, Kent S.(Dr), J. Van Paradijs, K. Mitsuda, R. Storm, R. T. Stewart, W. H. G. Lewin, W. Penninx, G. L. White, J. P. Norris, Astrophysical Journal, Vol. 365, Pp. 681-685, December, 1990.

"A Model Study Of The Response Of Mesospheric Ozone To Short Term Solar Ultraviolet Flux Variations", Summers, Michael (Dr), M. Allen, D. F. Strobel, G. M. Keating, M. T. Deland, R. M. Bevilacqua, Journal Of Geophysical Research, Vol. 95 #D13, Pp. 22323-538, December, 1990.

"Transitions And Energy Levels For Cu-Like Yb 41+, Ta 44+, And U 63+", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), B. J. Macgowan, C. J. Keane,, D. R. Kania,, J. O. Ekberg, J. Reader,, Journal Of Optical Soc. Of Am. B, Vol. 7 #10, Pp. 1993-1996, October, 1990.

"The Circumstellar Environment Of The Emission - Line Star, Lkha 101", M. J. Claussen, J.M. Schombert, M. Barsony, N. Z. Scoville, Astrophysical Journal, Vol. 362, Pp. 674-690, October, 1990.

"Source Composition Of Cosmic Rays At Energies 1 To 1000 Tev/Nucleon", Tsao, C. H.(Dr), M. M. Shapiro,, P. L. Biermann, R. Silberberg, Astrophysical Journal, Vol. 363, Pp. 265-269, November, 1990.

"Ne VII Line Ratios In The Sun", Widing, Kenneth G.(Dr), F. P. Keenan, S. M. Mccann,, Astrophysical Journal, Vol. 363, Pp. 315-317, November, 1990.

"Photospheric Abundances Of Oxygen, Neon, And Argon, Derived From The Xuv Spectrum Of An Impulsive Flare", Feldman, Uri (Dr), Widing, Kenneth G.(Dr),,, Astrophysical Journal, Vol. 363, Pp. 292-298, November, 1990.

"Dynamical And Photometric Model Of Star Formation In Tidal Tails", J. F. Wallin, Astronomical Journal, Vol. 100 #5, Pp. 1477-1488, November, 1990.

"43 Ghz-Vlbi Observations Of 3c 273 After A Flux Density Outburst In 1988 T. P. Krichbaum, R. S. Booth, A. J. Kus.", A Quirrenbach, A. Rogers, A. Witzel, B. O. Ronnang, C. Hummel, I.Pauling-Toth, J. Spencer, J. Zensus, K. Johnston, Astronomy & Astrophysics, Vol. 237, Pp. 3-11, November, 1990.

"Evolution Of The 155-Day Periodicity In Sunspot Areas During Solar Cycles 12 To 21", Lean, Judith (Dr),, Astrophysical Journal, Vol. 363, Pp. 718-727, November, 1990.

"The Scattering Rate Of Solar 834 A Radiation By Magnetospheric 0+ And 0++", Meier, Robert R.(Dr), Geophysical Research Letters, Vol. 17 #10, Pp. 1613-1616, September, 1990.

"Independence Of Fluctuations In Quasi-Periodic Oscillations And Low Frequency Noise On Short Time Scales In Gx5-1", Hertz, Paul (Dr), Wood, Kent S.(Dr), B. A. Vaughan, J. P. Norris, K. Mitsuda, P. Michelson, T. Dotani, Astrophysical Journal, Vol. 361, Pp. 514-526, October, 1990.

"Latitudinal Distribution Of Solar-Wind Speed From Magnetic Observations Of The Sun", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), A. G. Nash, Nature, Vol. 347, Pp. 439-443, October, 1990.

"A Limit On The Production Of  $^{56}\text{Ni}$  In A Type I Supernova", Share, Gerald H.(Dr), S. M. Matz, Astrophysical Journal, Vol. 362, Pp. 235-240, October, 1990.

"Measurement Of The 0.385 Mev Gamma Ray Spectrum From The Galactic Center Region", Share, Gerald H.(Dr), Kinzer, Robert L.(Dr), Harris, Michael, D. C. Messina, M.D. Leising,, Astrophysical Journal, Vol. 362, Pp. 135-146, October, 1990.

"The Effects Of Non-Equilibrium Ionization On Uv Line Shifts In The Solar Transition Region", Antiochos, Spiro K.(Dr), R. A. Zappala, D. Spadaro, G. Lanzafame, G. Noci, S. K. Antiochos, Astrophysical Journal, Vol. 362, Pp. 370-378, October, 1990.

"Density Sensitive Line Ratios For Highly Ionized Atoms Of The Cu I And Na I Isoelectronic Sequences", Doschek, George A.(Dr), Feldman, Uri (Dr), Seely, John F.(Dr), Journal Of Applied Physics, Vol. 68 #8, Pp. 3947-3952, October, 1990.

"Limits On A Variable Source Of 511 Ke V Annihilation Radiation Near The Galactic Center", Share, Gerald H.(Dr), D. C. Messina, M. D. Leising, W. R. Purcell, Astrophysical Journal Letters, Vol. 358, Pp. L45-L48, August, 1990.

"Polarization Of X-Ray Emission Lines From Heliumlike Scandium As A Probe Of The Hyperfine Interaction J. Henderson, P. Beiersdorfer", Doschek, George A.(Dr), Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), C.L. Bennett, S. Chantrane, D. Knapp, R. Marrs, M. Schneider, K. Wong, J. R. Henderson,, M.A. Lavine, Dubau,, The Physical Review Letters, Vol. 65 #6, Pp. 705-708, August, 1990.

"The Ionosphere Of Triton", Summers, Michael (Dr), H. B. Helberg, F. Herbert, D. E. Shemansky, A. L. Broadfoot, D. Strobel, J. C. McConnell, T. Majeed, Geophysical Research Letters, Vol. 17 #10, Pp. 1721-1724, September, 1990.

"Magnetospheric Interaction With Triton's Ionosphere", Summers, Michael (Dr), A. F. Cheng, D. F. Strobel, D. J. Strickland, Geophysical Research Letters, Vol. 17 #10, Pp. 1661-1664, September, 1990.

"W30 Revealed: Separation And Analysis Of Thermal And Nonthermal Emission In A Galactic Complex", K. W. Weiler, N. E. Kassim, Astrophysical Journal, Vol. 360, Pp. 184-196, September, 1990.

"The Photochemistry Of Methane In The Atmosphere Of Triton", Summers, Michael (Dr), D. Strobel, F. Herbert, Geophysical Research Letters, Vol. 17 #10, Pp. 1729-1732, September, 1990.

"Dust And Gas In The Cores And The Envelope In Sgr B2", J. M. Pintado, K. J. Johnston, P. De Vicente, T. L. Wilson, Astronomy & Astrophysics, Vol. 236, Pp. 193-201, September, 1990.

"Gravitational Lens Limits On Cosmological Black Holes", R. J. Nemiroff, Astrophysical Journal, Vol. 358, Pp. 5-17, July, 1990.

"Tests Of Weyl Gravity On Sub-Galactic Distance Scales", Wood, Kent S.(Dr), R. J. Nemiroff, Astrophysical Journal, Vol. 358, Pp. 5-17, July, 1990.

"Structure In Small Molecular Clouds: Pedestals And Clumping", B. B. Nath, J. M. Carpenter, L. Blitz, L. Magnani, N. E. Kassim, Astrophysical Journal, Vol. 73, Pp. 747-768, August, 1990.

"On The Dependence Of Solar Flare X-Ray Spectral Line Intensity Ratios Of Highly Ionized Sulfur, Calcium, And Iron On Electron Temperature", Doschek, George A.(Dr), Bentley, Fludra, Phillips, Watanabe, Astrophysical Journal, Vol. 358, Pp. 665-673, August, 1990.

"Spallation Process And Nuclear Interaction Products Of Cosmic Rays", Tsao, C. H.(Dr), Silberberg, Rein (Dr), Physics Report, Vol. 191 #6, Pp. 351-408, August, 1990.

"On The Dependence Of Solar Flare X-Ray Spectral Line Intensity Ratios Of Highly Ionized Sulfur, Calcium, And Iron On Electron Temperature", Doschek, George A.(Dr), A. Fludra, K. Phillips, R. Bentley, T. Watanabe, Astrophysical Journal, Vol. 358, Pp. 665-673, August, 1990.

"Bifurcation In The Low Chromosphere", Dere, Kenneth P.(Dr), R. G. Athay, Astrophysical Journal, Vol. 358, Pp. 710-717, August, 1990.

"A Comparison Of Models Of The Sun's Extreme Ultraviolet Irradiance Variations", Lean, Judith (Dr), Journal Of Geophysical Research, Vol. 95 #A8, Pp. 11,933-944, August, 1990.

"On The Formation Of Current Sheets In The Solar Corona", Karpen, Judith T.(Dr), Antiochos, Spiro K.(Dr), C. R. Devore, Astrophysical Journal, Vol. 356, Pp. L67-L70, June, 1990.

"Apparent Orbit Of The Spectroscopic Binary Ari With The Mark Iii Stellar Interferometer", D. Mozurkewich, K. Johnston, M. Colavita, M. Shao, R. Simon, X. P. Pan, Astrophysical Journal, Vol. 356, Pp. 641-645, June, 1990.

"Flow Patterns In A Sunspot Region Observed In The Photosphere Chromosphere And Transition Region", Dere, Kenneth P.(Dr), B. Schmieder, C. E. Alissandrakis, Astronomy & Astrophysics, Vol. 233, Pp. 207-219, July, 1990.

"Spectra And Energy Levels Of Sodiumlike Ions From Y28+ To Sn39+", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), J. O. Ekberg, J. Reader, Opt. Soc. Of Am. B, Vol. 7 #7, Pp. 1176-1181, July, 1990.

"Dynamic Modeling Of The Solar Atmosphere", Karpen, Judith T.(Dr), Mariska, John T.(Dr), R. B. Dahlburg, Eos, Vol. 71 #28, Pp. 791, July, 1990.

"The Gamma-Ray Light Curves Of Supernova 1987a", Share, Gerald H.(Dr), M. D. Leising, Astrophysical Journal, Vol. 357, Pp. 638-648, July, 1990.

"Heao-1 Observations Of The X-Ray Pulsar 1e2259+586", Wood, Kent S.(Dr), M. J. Coe, S. R. Davies, Astrophysical Journal, Vol. 245, Pp. 268-274, July, 1990.

"Solar Coronal Ar/Fe And Ne/Mg Abundance Ratios Derived From Ultraviolet Forbidden Line Spectra", Doschek, George A.(Dr), A. K. Bhatia, Astrophysical Journal, Vol. 358, Pp. 338-343, July, 1990.

"Nuclear Line Spectroscopy Of The 27 April 1981 Solar Flare", Share, Gerald H.(Dr), Murphy, Ronald J. (Dr), D. J. Forrest, J. R. Letaw, Astrophysical Journal, Vol. 358, Pp. 298-312, July, 1990.

"The Effect Of Non-Equilibrium Ionization On Uv Line Shifts In The Solar Transition Region", Antiochos, Spiro K.(Dr), G. Noci, R. A. Zappala, D. Spadaro, Astrophysical Journal, Vol. 355, Pp. 342-347, May, 1990.

"On The Stability Properties Of White Dwarf Radiative Shocks: Settling Resolutions", Wolff, Michael T. (Dr), J. N. Imamura, Astrophysical Journal, Vol. 355, Pp. 216-225, May, 1990.

"Polar Twilight Uv-Variable Radiation Field: Perturbations Due To Multiple Scattering, Ozone Depletion, Stratospheric Clouds And Surface Albedo", S. A. Lloyd, D. E. Anderson, Journal Of Geophysical Research, Vol. 95 #D6, Pp. 7429-7434, May, 1990.

"Solar Wind Speed And The Flux-Tube Expansion", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), Astrophysical Journal, Vol. 355, Pp. 726-732, June, 1990.

"Soft X-Ray Spectroscopy Of Solar Flares: An Overview", Doschek, George A.(Dr), Astrophysical Journal Suppl Series, Vol. 73, Pp. 117-130, June, 1990.

"The Relationship Of Iv Transition Region Structures To The Photospheric Magnetic Field", Brueckner, Guenter E.(Dr), Dere, Kenneth P.(Dr), G. E. Brueck, J. D. F. Bar, K. P. Dere, B.A.A.S. Jan. 9-13, 1990, Vol. 22 #2, Pp. 744, June, 1990.

"Relationship Of Magnetic Field Strength And Brightness Of Fine Structure Elements In The Solar Temperature Minimum Region", Cook, John W.(Dr), J. A. Ewing, Astrophysical Journal, Vol. 355, Pp. 719-725, June, 1990.

"Polar Faculae: 1906-1990", Sheeley, Neil R.(Dr), Astrophysical Journal, Vol. 374, Pp. 386-389, June, 1990.

"Episodal Coronal Heating", Antiochos, Spiro K.(Dr), J. A. Klimchuk, P. A. Sturrock, W. W. Dixon, Astrophysical Journal, Vol. 356, Pp. L31-L34, June, 1990.

"Faint Radio Sources And Gravitational Lensing", J. Lehar, B. F. Burke, G. I. Langston, J. N. Hewitt, M. B. Heflin, S. R. Conner, Astrophysical Journal, Vol. 353, Pp. 34-38, April, 1990.

"Fe Xv Line Ratios In The Sun: Discrepancies Between Theory And Observations", Widing, Kenneth G.(Dr), A. E. Kingston, P. L. Dufton, Astrophysical Journal, Vol. 353, Pp. 323-328, April, 1990.

"The Complex Jet Associated With The Quasar 0836 +71", A. Quirrenbach, A. Witazel, C. A. Hummel, C. J. Schalinski, K. J. Johnston, T. P. Krichbaum, Astronomy & Astrophysics, Vol. 230, Pp. 271-283, April, 1990.

"Low Frequency Radio Astronomy From Earth Orbit", K. W. Weiler, N. E. Kassim, Iau Coll. #123, April, 1990.

"Oed Contributions To The 3s - 3p Transitions In Highly-Charged Na-Like Ions", Seely, John F.(Dr), R. A. Wagner, Physical Review A May 1990, Vol. 41 #9, Pp. 5246-5249, May, 1990.

"Rafgl 2233 And Rafgl 2901: Carbon Stars With A Superwind", L. M. Ziurys, M. J. Claussen, Astronomy & Astrophysics, Vol. 231, Pp. 73-76, May, 1990.

"Search For Millisecond X-Ray Pulsations From The Galactic Bulge X-Ray Source Gx 9+1", Hertz, Paul (Dr), Wood, Kent S.(Dr), B. A. Vaughan, J. P. Norris, P. F. Michelson, Astrophysical Journal, Vol. 354, Pp. 267-272, May, 1990.

"Sensitive Vla Observation Of Oh 127.8-0.0 And Oh26.5 +0.6", K. J. Johnston, P. F. Bowers, Astrophysical Journal, Vol. 354, Pp. 676-686, May, 1990.

"The Sgr B2 Star Forming Region: Subarcsecond Radio Spectral Line And Continuum Observations", M. J. Claussen, R. A. Gaume, Astrophysical Journal, Vol. 351, Pp. 538-562, May, 1990.

"Observations And Models Of Star Formation In The Tidal Features Of Interacting Galaxies", C. Struck-Marcell, J. F. Wallin, J. M. Strombert, Iau Colloquium 124 1 March 90, Vol. 124, Pp. 727-730, March, 1990.

"Spectrum And Energy Levels Of Six Times Ionized Molybdenum (Mo Vii)", Feldman, Uri (Dr), J. Reader, Journal Of The Opt Soc Of Am B, Vol. 7, Pp. 253, March, 1990.

"Aerosol Size Distributions And Optical Properties Found In The Marine Boundary Layer Over The Atlantic Ocean", E. J. Mack, G. M. Frick, J. W. Fitzgerald, R. E. Larson, W. Hoppel, Journal Of Geophysical Research, Vol. 95 #D4, Pp. 3659-3686, March, 1990.

"A Radio/Optical Reference Frame. Ii: Additional Radio And Optical Source Positions In The Northern Hemisphere", C. Ma, C. De Vegt, D. Shaffer, J. L. Russell, K. J. Johnston,, Astrophysical Journal, Vol. 99 #4, Pp. 1284-1298, April, 1990.

"Precise Radio Source Positions Determined By Mark Iii Vlbi: Observations From 1979 To 1988 And A Tie To The Fk5", C. Deveg, C. Ma, J. Russell, K. J. Johnston, Astronomical Journal, Vol. 99, Pp. 1284-1298, April, 1990.

"September 7, 1973 Two-Ribbon Flare: I. Morphology And Loop Expansion", Widing, Kenneth G.(Dr), J. G. Doyle, Astrophysical Journal, Vol. 352, Pp. 754-759, April, 1990.

"September 7, 1973 Two Ribbon Flare: Ii. Physical Properties Of The Loops In The Arcade", Widing, Kenneth G.(Dr), J. G. Doyle, Astrophysical Journal, Vol. 352, Pp. 760-766, April, 1990.

"An Explanation For Cosmic Ray Source Abundances Including Nitrogen", Tsao, C. H.(Dr), Silberberg, Rein (Dr), Astrophysical Journal Letters, Vol. 352, Pp. L49-L52, April, 1990.

"Can Your Telescope Detect Gravitational Lensing", R. J. Nemiroff, B.A.A.S. 175th Mtg Jan 9j-13, 1990, Vol. 21 #1, Pp. 754, February, 1990.

"An Empirical Model Of Total Solar Irradiance Variation Between 1874 To 1988", Lean, Judith (Dr), P. Foukal, Science, Vol. 247, Pp. 556-558, February, 1990.

"Return Of The Hard Flares 154 - Day Periodicity In Solar Cycle 22 And Evidence For A Phase Relationship Of This Periodicity Between", Brueckner, Guenter E.(Dr), Cook, John W.(Dr), Astrophysical Journal Letters, Vol. 350, Pp. L21-L24, February, 1990.

"H1722 + 119: A Highly Polarized X-Ray Selected B1 Lacertae Object", Hertz, Paul (Dr), D. A. Schwartz, I. R. Tuohy, R. J. V. Brissender, R. S. Remillard, Astrophysical Journal, Vol. 350, Pp. 578-584, February, 1990.

"H1722 + 119: A Highly Polarized X-Ray Selected B1 Lacertae Object", Hertz, Paul (Dr), Schwartz, D., Brissenden, R.J.V., Remillard, R.A., Trohy, I.R., Astrophysical Journal, Vol. 350, Pp. 578-584, February, 1990.

"Fundamentals Of Ion-Beam Assisted Deposition. I. Model Of Process And Reproductivity Of Film Composition", Vanvechten, Debbie (Dr), E. D. Correll, E. P. Donovan, G. K. Hubler, Journal Of Vac Sci & Tech A, Vol. 8 #2, Pp. 821-830, March, 1990.

- "Fundamentals Of Ion-Beam Assisted Deposition. Ii. Absolute Calibration Of Ion And Evaporant Fluxes", Vanvechten, Debbie (Dr), C. A. Carosella, E. P. Donovan, G. K. Hubler, Journal Of Vacuum Science & Technology, Vol. 8 #2, Pp. 831-839, March, 1990.
- "The Location And Sizes Of Nh3 Masers In W51", C. Henkel, K. Johnston, T. Wilson, Astronomy & Astrophysics Letters, Vol. 229 #1, Pp. L1-L4, March, 1990.
- "The Spartan I Mission", Fritz, Gilbert G., Cruddace, Raymond G.(Dr), Brandenstein, Creighton, Fabian, Fenimore, Gross, Lucid, Nagel, Shrewsberry, Sutschewski, Zimmerman, Journal Of The British Interplanetary So, Vol. 43, Pp. 223-229, January, 1990.
- "Submicron Aerosol Size Distributions Measured Over The Tropical And South Pacific", G. M. Frick, W. A. Hoppel, Atmospheric Environment Feb 90, Vol. 24a #3, Pp. 645-659, January, 1990.
- "A Possible New Association Of A Pulsar With A Supernova Remnant", K. Weiler, N. E. Kassim, Nature, Vol. 343, Pp. 146-147, January, 1990.
- "Gamma Rays From Molecular Clouds And From Pulsar Wolf -Rayet Star Systems", Murphy, Ronald J. (Dr), R. Murphy,, R. Silberberg, 21st Int'l Cosmic Ray Conf 6-19 Jan 90, Vol. 1, Pp. 162-165, January, 1990.
- "The Seasonal Variation Of Water Vapor And Ozone In The Upper Mesosphere: Implications For Vertical Transport And Ozone Photochemistry", Summers, Michael (Dr), Strobel, Darrell, J. J. Olivero, M. Allen, R. M. Bevilacqua, Journal Of Geophysical Research, Vol. 95 #Di, Pp. 883-893, January, 1990.
- "Uv Observations Of The Pre-Impulsive Phase In A Solar Flare: Enhanced Turbulence And Heating", Cheng, Chung-Chieh (Dr), Astrophysical Journal, Vol. 349, Pp. 362-368, January, 1990.
- "Radio Supernovae", K. Weiler, R. Stramek, Radio Supernovae (Verlag Springer), Vol. Ch. 7, Pp. Book, February, 1990.
- "An Empirical Model Of Total Solar Irradiance Variation Between 1874 And 1988", Lean, Judith (Dr), J. Lean, P. Foukal, Science, Vol. 247, Pp. 556-558, February, 1990.
- "Solar Physics Space Missions", Brueckner, Guenter E.(Dr), Encyclopedia Of Astronomy & Astrophysics, Pp. 646-648, January, 1990.
- "Spectral Line Intensities For The Carbon Isoelectronic Sequence (Kr Xxi Through Xe II)", Feldman, Uri (Dr), Seely, John F.(Dr), M. Klapisch, W. H. Goldstein, Atomic Data & Nuclear Data Tables, Vol. 45321, January, 1990.
- "Measurements Of The Normal-Incidence X-Ray Reflectance Of A Molybdenum-Silicon Multilayer Deposited On A 2000 1/Mm Grating", Cruddace, Raymond G.(Dr), W. R. Hunter, J. C. Rife, T. W. Barbee, Physica Scripta, Vol. 41, Pp. 396-399, January, 1990.
- "An Algorithm For The Fast Fourier Transform On A Connection Machine", Hertz, Paul (Dr), Computers In Physics, Vol. 4 #1, Pp. 86 -, January, 1990.
- "Ionospheric Effects On Modern Electronic Systems", J. Aarons, J. M. Goodman, Ieee Journal, Vol. 78, Pp. 512-527, January, 1990.

"Infrared Immission From X-Ray Binaries -- Iras Observations", H. Smith, J. H. Beal, M. R. Swai, *Astronomical Journal*, Vol. 99 #1, Pp. 273-287, January, 1990.

"Magnetic Energy Release In Interacting Loops Observed In A Solar Flare From Skylab", Cheng, Chung-Chieh (Dr), Widing, Kenneth G.(Dr), C. C. Cheng, K. Widing, *Adv. In Space Research*, Vol. 10 #9, Pp. 9-97-9-100, January, 1990.

"Aerosol Charge Distributions Produced By Neutralizers", G. M. Frick, W. A. Hoppel, *Aerosol Science & Technology*, Vol. 12, Pp. 471-496, January, 1990.

"The Ar/Ca Abundance Ratio In Solar Flares", Doschek, George A.(Dr), Seely, John F.(Dr), *Astrophysical Journal*, Vol. 348, Pp. 341-345, January, 1990.

"Sector-Focused Stability Methods for Robust Source Localization in Matched-Field Processing." G. Fricther, C.L. Byrne and C. Feuillade, *J. Acoust. Soc. Am.*; 88 (6), December 1990.

Higher-Order Correlations for the Detection of Deterministic Transients." G. Ioup, L. Pflug, J. Ioup, K. Barnes, R. Field, J. Leclere and G. Rayborn, *JUA*, October 1990.

"Transient Signal Distortion in a Distributed Sensor Field-Range Independent and Up-Slope Environments." R. Field, J. Leclere and E.J. Yoerger, *JUA*, October 1990.





d. Refereed journals  
1991:

"The 1987 Norda Active Barrier Experiment In Dabob Bay," J. George and W.A. Kinney, JUA, Volume 41, Number 2, April 1991.

"Lamb And Creeping Waves Around Submerged Spherical Shells Resonantly Excited By Sound Scattering II Further Applications," M.F. Werby and G.C. Gaunaud, JASA, Volume 89, Number 4, Part. 1, April 1991.

"Similarities Between Various Lamb Waves In Submerged Spherical Shells, And Rayleigh Waves In Elastic Spheres And Flat Half Spaces," M.F. Werby and G.C. Gaunaud, Journal of the Acoustical Society of America, Volume 89, Number 6, pp 2731-2739, June 1991.

"A Numerical Technique To Describe Acoustical Scattering And Propagation From And Object In A Waveguide," G. Norton, and M.F. Werby, Journal of Applied Physics, Volume 70, Number 8, October 1991.

"Three-Dimensional Angular Distributions Of Acoustic Scattering From Flexural And Rayleigh Resonances Of Elastic Spheroidal Targets," J. George and M.F. Werby, JASA, Volume 90, Number 5, pp 2847-2850, November 1991.

"Sound Scattering By Resonantly Excited, Fluid-Loaded, Elastic Spherical Shells," M.F. Werby (2nd) and G.C. Gaunaud (1st), JASA, Volume 90, Number 5, pp 2536-2550, November 1991.

"The Acoustical Background For A Submerged Elastic Shell," M.F. Werby, JASA, Volume 90, Number 6, pp 3279-3287, December 1991.

"Scattering From Elastic Shells At Coincidence Frequency," M.F. Werby, Acoustic Letters, Volume 15, Number 3, pp 39-42, 1991.

Comments on "A New Efficient Algorithm To Compute The Exact Reflection And Transmission Factors For Plane Waves In Layered Absorbing Media (Liquids )," JASA, p. 3371, 1991.

"High-Speed Multi-Color Photometry Of V834 Centaurus", Wolff, Michael T. (Dr), J. Middleditch, J. N. Imamura, T. Y. Steiman-Cameron, Astrophysical Journal, Vol. 382, pp. 315-320, November, 1991.

"On The Formation Of Current Sheets In The Solar Corona", Karpen, Judith T.(Dr), Antiochos, Spiro K.(Dr), R. Devore, Astrophysical Journal, Vol. 382, pp. 327-337, November, 1991.

"The Uv Photo-Response Characteristics Of Diamond Diodes," Moses, J. Dan (Dr), Marchywka, Michael J., Socker, Dennis G.(Dr), R. T. Goldberg, J. F. Hochedez, M. W. Geis, Applied Optics July 1991, Vol. 30 #34, pp. 5011--, December, 1991.

"Triton's Atmosphere: A Source Of N And H For Neptune's Magnetosphere", Summers, Michael (Dr), Strobel, Darrell, Geophysical Research Letters, Vol. 18 #12, pp. 2309-2312, December, 1991.

"Quasiperiodic Phenomena In Accreting Binary Stars", Hertz, Paul (Dr), J. P. Norris, Statistical Challenges In Modern Ast.(B), pp. 367-377, December, 1991.

\* Believed to be Peer-Reviewed

"A New Solar Cycle Model Including Meridional Circulation", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), A. G. Nash, Astrophysical Journal, Vol. 383, pp. 431-442, December, 1991.

"Dynamics Of Solar Coronal Magnetic Fields", Antiochos, Spiro K.(Dr), R. B. Dahlburg, T. A. Zang, Astrophysical Journal, Vol. 383, pp. 420-430, December, 1991.

"Dynamics Of Solar Coronal Magnetic Fields", Antiochos, Spiro K.(Dr), R. B. Dahlburg, S. K. Antiochos,, T. A. Zang, Astrophysical Journal, Vol. 383, pp. 420-430, December, 1991.

"Extended Analysis Of The X-Ray Spectrum Emitted By Highly Ionized Uranium From A Laser Produced Plasma In The 4.1 To 6.4 Kev Range", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), D. Kania, P. Mandelbaum, R. Kauffman, Physical Review A, Vol. 44 #9, pp. 5752-5761, November, 1991.

"Velocity Gradients In The Chromosphere-Corona Transition Region", Dere, Kenneth P.(Dr), R. G. Athay, Astrophysical Journal, Vol. 381, pp. 323-332, November, 1991.

"Evidence For Trapped Anomalous Cosmic Ray Oxygen Ions In The Inner Magnetosphere", Tylka, Allan J.(Dr), Adams, James H.(Dr), Ch. A Tretyakova, J. B. Blake, M. A. Kondratyev, M. I. Panasyuk, Mewaldt, N. L. Grigorov, Schultz, Geophysical Research Letters, Vol. 18 #11, pp. 1959-1962, November, 1991.

"Variations In The Sun's Radiative Output", Lean, Judith (Dr), Reviews Of Geophysics, Vol. 29, pp. 505-536, November, 1991.

"Relative Abundances In The Lower Solar Transition Region", Doschek, George A.(Dr), Dere, Kenneth P.(Dr), Astrophysical Journal, Vol. 381, pp. 583-590, November, 1991.

"Soft X-Ray Emission From Electron-Beam-Heated Solar Flares", Mariska, John T.(Dr), D. M. Zarro, Astrophysical Journal, Vol. 381, pp. 572-577, November, 1991.

"A Search For The 2.223 Mev Neutron Capture X-Ray Line From The Directions Of Cygnus And The Galactic Center", Share, Gerald H.(Dr), Harris, Michael, Astrophysical Journal, Vol. 381, pp. 439-443, November, 1991.

"Non-Equilibrium Ionization Effects In Asymmetrically Heated Loops", Mariska, John T.(Dr), Antiochos, Spiro K.(Dr), D. Spadaro, Astrophysical Journal, Vol. 382, pp. 338-343, November, 1991.

"The Iron-To-Calcium Abundance Ratio In The 20-Million-Degree Plasma Of Medium And Large Solar Flares", Feldman, Uri (Dr), K. J. H. Phillips, Astrophysical Journal, Vol. 379, pp. 401-405, September, 1991.

"Chromospheric And Transition Region Diagnostics Using Emission Line Intensities", Dere, Kenneth P.(Dr), R. G. Athay, Astrophysical Journal, Vol. 379, pp. 776-787, October, 1991.

"Solar Gamma-Ray-Line Flares. Type II Radio Bursts. And Coronal Mass Ejections", Howard, Russell A.(Dr), D. J. Forrest, E. W. Cliver, H. V. Cane, D., L. S. Wright, M. J. Koomen, Astrophysical Journal, Vol. 379, pp. 741-750, October, 1991.

"Analytic Models For The Ozone Radiative Absorption Rate Of 9.6 Um In The Mesosphere", Summers, Michael (Dr), Strobel, Darrell, X. Zhu, Journal Of Geophysical Research, Vol. 96 #D10, pp. 18,551-559, October, 1991.

"Analytic Models For The Ozone Radiative Absorption Rate Of 9.6 Um In The Mesosphere", Summers, Michael (Dr), Strobel, Darrell, X. Zhu, Journal Of Geophysical Research, Vol. 96 #D10, pp. 18,551-18,559, October, 1991.

"Ultraviolet Spectroscopy And Remote Sensing Of The Upper Atmosphere", Meier, Robert R.(Dr), Space Science Reviews, Vol. 58 #1/2, pp. 1-187, October, 1991.

"Numerical Simulations Of Microflare Evolution In The Solar Transition Region And Corona", Mariska, John T.(Dr), A. Sterling, K. Shibata, Y. Suematsu, Astrophysical Journal, Vol. 381, pp. 313-322, November, 1991.

"Numerical Simulations Of Flares On M Dwarf Stars: I. Hydrodynamics And Coronal X-Ray Emission", Cheng, Chung-Chieh (Dr), R. Pallavicini, Astrophysical Journal, Vol. 381, pp. 234-249, November, 1991.

"Updated Climatological Model Predictions Of Ionospheric And Hf Propagation Parameters", F. J. Rhoads,, J. M. Goodman,, M. H. Reilly, M. Singh, Radio Science, Vol. 26 #4, pp. 1017-1024, August, 1991.

"Production Of N+\* From N2+ Hv: Effective Euv Emission Yields From Laboratory And Dayglow Data", Meier, Robert R.(Dr), E. M. Lee, J. A. Samson, Y. Chung, Z. X. He, Planetary & Space Science, Vol. 39 #8, pp. 1197-1207, August, 1991.

"Transitions And Energy Levels In Al-Like Ge Xx, Sexxii, Srxxvi, Y Xxvii And Zr Xxviii", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), A. Redford, J. O. Ekberg, Physica Scripta, Vol. 44, pp. 539-547, September, 1991.

"High Temperature Plasma In Solar Flares", Doschek, George A.(Dr), Philosophical Trans. Of The Royal Soc A, Vol. 336,pp. 451-460, September, 1991.

"A Model For The Formation Of Solar Prominences", Antiochos, Spiro K.(Dr), J. A. Klimchuk, Astrophysical Journal, Vol. 378, pp. 372-377, September, 1991.

"The Optical Emission From Oscillating White Dwarf Radiation Shock Waves", Wolff, Michael T. (Dr), H. Rashed, J. N. Imamura, Astrophysical Journal, Vol. 378, pp. 665-673, September, 1991.

"The 3s2 3p2 P - 3s3p2 4p Intercombination Lines Of Fe Xiv In The Sun", Widing, Kenneth G.(Dr), A. E. Kingston, E. S. Conlon, K. P. Keenan, M. B. Boylan, P. L. Dufton, Astrophysical Journal, Vol. 379, pp. 406-408, September, 1991.

"Searches For Millisecond Pulsations In Low Mass X-Ray Binaries", Hertz, Paul (Dr), Wood, Kent S.(Dr), B. A. Vaughan, J. P. Norris, K. Mitsuda, P. F. Michelson, Astrophysical Journal, Vol. 379, pp. 295-309, September, 1991.

"Probing Galactic Halo Dark Matter With Microlensing", R. J. Neimroff, Astronomy And Astrophysics, Vol. 247, pp. 73-76, July, 1991.

"The Charge State Of The Anomalous Component", Tylka, Allan J.(Dr), Adams, James H.(Dr), B. Klecker, M. Garcia-Munoz, M. I. Panasyuk, Mason, Mcguire, Mewaldt, N. A. Kondrallyeva, N. L. Grigorov, Astrophysical Journal Letters, Vol. 375, pp. L45-L48, July, 1991.

"Magnetic Flux Transport And The Sun's Dipole Moment: New Twists To The Babcock-Leighton Model", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), Astrophysical Journal, Vol. 375, pp. 761-770, July, 1991.

"Observations Of Sco X-1 With Iue: Ultraviolet Results From A Multi-Wavelength Campaign", Hertz, Paul (Dr), Wood, Kent S.(Dr), F. Verbunt, J. C. Raymond, K. Mitsuda, S. D. Vrtilik, W. H. G. Lewin, Astrophysical Journal, Vol. 376, pp. 278-288, July, 1991.

"Diamond Cold Cathodes", Marchywka, Michael J., Socker, Dennis G.(Dr), J. D. Woodhouse, J. F. Hochedez, M. D. Mcaleese, M. W. Geis, Ieee Electron Device Let., Vol. 12 #8, pp. 456-459, August, 1991.

"Out Of Ecliptic Tests Of The Inverse Correlation Between Solar Wind Speed And Coronal Expansion", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), E. T. Swanson, Journal Of Geophysical Research, Vol. 96 #A8, pp. 13,861-868, August, 1991.

"The Charge State Of The Anomalous Component: Results From The Trapped Ions In Space Experiment", Tylka, Allan J.(Dr), Beahm, Lorraine P., Adams, James H.(Dr), Astrophysical Journal, Vol. 377, pp. 292-305, August, 1991.

"Upgrades For Efficient 3d Ionospheric Ray Tracing-Investigation Of Hf Nvis Effects", M. H. Reilly, Radio Science, Vol. 26 #4, pp. 971-980, August, 1991.

"Probability Of Quasiperiodic Self-Trapping Due To Localized Energy Deposition In Nonequilibrium Tunnel-Junctions Detectors", Vanvechten, Debbie (Dr), Wood, Kent S.(Dr), Physical Review B, Vol. 43 #16, pp. 12852-860, June, 1991.

"Simulated Rosat Observations Of Clusters Of Galaxies", Cruddace, Raymond G.(Dr), C. Rosso, G. Hasinger, J. H. M. M. Schmidt, J. Trumper, R. G. Cruddace, Experimental Astronomy, Vol. 1 #6, pp. 365-388, June, 1991.

"Fe Xiv Line Ratios In The Sun", Widing, Kenneth G.(Dr), A. E. Kingston, F. P. Keenan, M. B. Boylan,, P. L. Dufton,, Astrophysical Journal, Vol. 373, pp. 695-698, June, 1991.

"Explosive Events And Magnetic Reconnection In The Solar Atmosphere", Brueckner, Guenter E.(Dr), Dere, Kenneth P.(Dr), J. D. F. Bartoe, J. Ewing, P. Lund, Journal Of Geophysical Research-Sp. Phys, Vol. 96 #A6, pp. 9399-9407, June, 1991.

"The Nrl Solrad X-Ray Detectors: A Summary Of The Observations And A Comparison With The Sms/Goes Detectors", R. W. Kreplin, S. W. Kahler, Solar Physics, Vol. 133 #2, pp. 371-384, June, 1991.

"Noise-Driven Radiative Shocks: A New Model For The Optical Quasi-Periodic Oscillations Of The Am Hercules Objects", Wolff, Michael T. (Dr), Wood, Kent S.(Dr), J. N. Imamura, Astrophysical Journal, Vol. 375, pp. L31-L34, July, 1991.

"A Search For The 478 Kev Line From The Decay Of Nucleosynthesis  ${}^7\text{Be}$ ", Share, Gerald H.(Dr), M. D. Leising,, M. J. Harris, Astrophysical Journal, Vol. 375, pp. 216-220, July, 1991.

"Thin-Film Interference Optics For Imaging The Oii 834a Airglow", Seely, John F.(Dr), W. R. Hunter, Journal Of Geophysical Research, Vol. 30 #19, pp. 2788-2794, July, 1991.

"The Magnetic Network Location Of Explosive Events Observed In The Solar Transition Region", Dere, Kenneth P.(Dr), J. G. Porter, Astrophysical Journal, Vol. 370, pp. 775-778, April, 1991.

"The Magnetic Network Location Of Explosive Events Observed In The Solar Transition Region", Dere, Kenneth P.(Dr), J. G. Porter, K. P. Dere, Astrophysical Journal, Vol. 370, pp. 775-778, April, 1991.

"An Ultraviolet Spectral Atlas Of A Sunspot And An Active Region 1190-1730a", Brueckner, Guenter E.(Dr), J. D. F. Bartoe, O. K. Jeldseth-Moe, P. Brekke, Astrophysical Journal Supplement, Vol. 75, pp. 1337-1366, April, 1991.

"Photospheric And Coronal Magnetic Fields", Sheeley, Neil R.(Dr), Reviews Of Geophysics, Vol. 29, pp. 925-931, April, 1991.

"Evidence For A 250 S Brightness Oscillation At 1600 A In The Solar Temperature Minimum Region", Cook, John W.(Dr), J. A. Ewing, Astrophysical Journal, Vol. 371, pp. 804-809, April, 1991.

"Solar Abundances From Gamma-Ray Spectroscopy: Comparisons With The Photosphere And Energetic Particles", R. J. Murphy, R. Ramaty, B., B. Kozlovsky,, D. V. Reames, Astrophysical Journal, Vol. 371, pp. 793-803, April, 1991.

"Why Fast Solar Wind Originates From Slowly Expanding Coronal Flux Tubes", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), Astrophysical Journal Letters, Vol. 372, pp. L45-L48, May, 1991.

"Constraining Compact Disk Matter With Gravitational Lensing", R. J. Nemiroff, Comments On Astrophysics 4/91, Vol. 15 #3, pp. 139-147, May, 1991.

"Superconducting Tunnel Junctions For Use As Energy Resolving - X-Ray Detectors", Fritz, Gilbert G., Vanvechten, Debbie (Dr), Lovellette, Michael (Dr), Kowalski, Michael P.(Dr), Boyer, Craig (Dr.), E. Kirk, M. G. Blamire, R. E. Somekh, S. King, IEEE Transactions On Magnetics, Vol. 27 #2, pp. 2665-2668, March, 1991.

"The Solar Spectrum Between 914 And 1177a", Doschek, George A.(Dr), Feldman, Uri (Dr), Astrophysical Journal Supplement, Vol. 75, pp. 925-934, March, 1991.

"Wavelengths And Energy Levels For The Na I Isoelectronic Sequence Y28+ Through U81+", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), C. J. Keane, J.O. Ekberg, W. E. Behring, Atomic Data And Nuclear Data Tables, Vol. 47, pp. 1-15, March, 1991.

"Transitions Of The Type 2s-2p In Highly-Charged Fluorinelike And Oxygenlike Mo, Cd, In, And Sn", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), W. E. Behring, B. J. Macgowan, C. J. Keane,, D. R. Kania,, J. O. Ekberg, Journal Of The Optical Society Of Am B, Vol. 8 #3, pp. 531-537, March, 1991.

"Fe Xii Line Ratios In Solar Flares", Widing, Kenneth G.(Dr), R. J. U. Henry, S. M. Mccann, S. S. Tayal, F. P. Keenan, Astrophysical Journal, Vol. 369, Pp. 567-569, March, 1991.

"Analysis Of The Solar Oiii/Oiii Multiplets At 834 A: Implications For The Emission Distribution In The Vicinity Of 40,000 K", Meier, Robert R.(Dr), Feldman, Uri (Dr), Widing, Kenneth G.(Dr), Astrophysical Journal, Vol. 369, pp. 570-573, March, 1991.

"Nitrogen Airglow Sources: Comparison Of Triton, Titan, And Earth", Meier, Robert R.(Dr), Summers, Michael (Dr), Strobel, Darrell, D. J. Strickland, Geophysical Research Letters, Vol. 18 #4, pp. 689-692, April, 1991.

"Finite Electron Range And Implications For Superconducting Photon Detectors", Vanvechten, Debbie (Dr), Lovellette, Michael (Dr), Wood, Kent S.(Dr), Physica B, Vol. 169, pp. 439-440, January, 1991.

"Rotation Of The Sun's Outer White Light Corona Determined From Solwind Data", A. G. Nash, Astrophysical Journal, Vol. 366, pp. 592-598, January, 1991.

"Fabrication, Measurement, And Modeling Of Epitaxial Niobium Tunnel Junction X-Ray Detectors", Fritz, Gilbert G., Vanvechten, Debbie (Dr), Lovellette, Michael (Dr), Wood, Kent S.(Dr), Boyer, Craig (Dr.), Blamire, E. C. G. Kirk, Evetts, G. Arnold, S. E. King, Somekh, X-Ray Detection Superconduct. Tunnel Jun, pp. 165-195, January, 1991.

"Limits On Compact Dark Matter From Null Results Of Searches For Lensing Of Quasistellar Objects", R. L. Nemiroff, Physical Review Letters, Vol. 66 #5, pp. 538-540, February, 1991.

"Magnetic Field Configurations Associated With Fast Solar Wind", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), Solar Physics, Vol. 131, pp. 165-186, February, 1991.

"Constraints On Weyl Gravity On Sub-Galactic Distance Scales", Wood, Kent S.(Dr), R. J. Nemiroff, Astrophysical Journal, Vol. 369, pp. 54-56, March, 1991.

"Intensities Of The Neonlike Iron (Fe 16+) 2p 5 3-2p 5 3 And 2p 5 3p-2p 5 3d Transitions In Solar Flare Spectra", Doschek, George A.(Dr), Feldman, Uri (Dr), Physical Review A, Vol. 43 #5, pp. 2565-2568, March, 1991.

"Analysis Of Magnesiumlike Spectra From Mo Xxxi To Cs Xliv", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), B. J. Macgowan, C. J. Keane, D. R. Kania, J. O. Ekberg, Physica Scripta, Vol. 43, pp. 19-32, March, 1991.

"Spartan - 1 X-Ray Observations Of The Perseus Cluster: Ii. The Distribution Of Flux And Hardness Ratio Out To A Radius Of 50 Arc", Snyder, William A.(Dr), Fritz, Gilbert G., Kowalski, Michael P.(Dr), Cruddace, Raymond G.(Dr), J. Middleditch, M. P. Ulmer, S. R. Majewski, E. Fenimore, Astrophysical Journal, Vol. 365, pp. 460-470, December, 1990.

"Coordinated Observations With High Resolution Spectrographs (Hrts, Serts, Msdp)", Dere, Kenneth P.(Dr), B. Schmieder, R. J. Thomas, W. M. Neupert, W. T. Thompson, Adv. Space Res. Vol 11, Vol. 11 #5, pp. 255-258, January, 1991.

"Spartan 1 X-Ray Observation Of Ion Line Emission In The Perseus Cluster", Snyder, William A.(Dr), Fritz, Gilbert G., Kowalski, Michael P.(Dr), Cruddace, Raymond G.(Dr), E.E. Fenimore, M. P. Ulmer, Lecture Notes In Physics, Vol. 385 #2, pp. 72-75, January, 1991.

"Magnetic Dipole Line From U Lxxi Ground Term Levels Predicted At 2838 A", Feldman, Uri (Dr), J. Sugar, P. Indelicato,, Optical Society Of America B, Vol. 8 #1, pp. 3-5, January, 1991.

"Sounding Rockets In Astronomy", Carruthers, George R.(Dr), Ref. Ency. Astronomy & Astrophysics, pp. 650, January, 1991.

"On The Nature Of Soft Gamma Repeaters", Hertz, Paul (Dr), Wood, Kent S.(Dr), J. P. Norris, Astrophysical Journal, Vol. 366, pp. 240-252, January, 1991.

"Electron Temperatures In A Pulsed Electric Discharge And The Associated N2 Electron Impact Rate Coefficients", Morrill, Jeff S., Widing, Kenneth G.(Dr), W. M. Benesch,, American Inst. Of Physics, Vol. 94 #1, pp. 262-269, January, 1991.

"Compact, High-Current Accelerators and their Prospective Applications," C. A. Kapetanacos, L. K. Len, T. Smith, D. Dialectis, S. J. Marsh, P. Loschialpo, J. Golden, J. Mathew, and J. H. Chang, Phys. Fluids B 3, 2396, 1991.

"Plane Wave Analysis of Acoustic Signals in a Sandy Sediment," B. Farwell, R. Altenburg, N. Chotiros and C. Faulki, J. Acoust. Soc. Am.; 89 (1), January 1991.

"Variability of Shallow-Water Bistatic Bottom Backscattering," S. Stanic, E. Kennedy and R.I. Ray, JASA; 90 (1), July 1991.

"Numeric Processing in Fortran Computing," R. Meredith, Computers in Physics, Vol. 6, No. 5, September/October 1991.

"Arctic Ocean Shallow Water Ambient Noise Characteristics," C.T. Mire, D.J. Ramsdale and P.J. Bucca, JUA Pub., 1991.

"Horizontal Array Performance in the Chukchi Sea," D.J. Ramsdale (3rd), Murphy (2nd), and Lawrence (1st), JUA Pub., 1991.

"Horizontal Spatial Coherence at High Frequency," M. Wilson, Posey and Erato, JUA Pub., 1991.

"Recent Developments on the NRL Modified Betatron Accelerator," J. Golden, L. K. Len, T. J. Smith, D. Dialectis, S. J. Marsh, K. Smith, J. Mathew, P. Loschialpo, L. Seto, J. H. Chang, and C. A. Kapetanacos, SPIE 1407, 418, 1991.

"Radar's Environmental Role," M. I. Skolnik, IEEE Potentials, Vol. 10, No. 2, pp. 13-16, April, 1991.

"Statistics of Low Grazing Angle Sea Scatter for Moderate and Fully Developed Ocean Waves," D. B. Trizna, IEEE Trans. on Antenna Propagat., Vol. 39, Dec, 1991.

"Laboratory Studies of Radar Sea Spikes at Low Grazing Angles," D. B. Trizna, J. P. Hansen, Paul Hwang and Jin Wu, JGR Oceans, Vol. 96, pp. 12529-12537, 1991.

"High Frequency Approximations for Edge Scatter from Surfaces of Revolution," W. B. Gordon and H. J. Bilow, Journal Opt Soc. of Am., Vol. 8. No. 1, pp. 11-13, January, 1991.

"Scattering by an Infinite Wedge with Tensor Impedance Boundary Conditions-A Moment/method Physical Optics Solution for the Currents," H. J. Bilow, IEEE Trans. on Antenna Propagat., Vol. 39, No. 6, pp. 767-773, June, 1991.

"Convergence Properties of the Gram-Schmidt and SMI Adaptive Algorithms, Part II," Karl Gerlach and F. F. Kretschmer, Jr., IEEE Trans. on AES, Vol. 27, No. 1, pp. 83-91, January 1991.

"Low Sidelobe Radar Waveforms Derived from Orthonogal Matrices," Karl Gerlach and F. F. Kretschmer, Jr., IEEE Trans. on AES, Vol 27, No. 1, pp. 92-102, Jan. 1991.

"Convergnace Bounds of an SMI/Gram/Schmidt Canceller in Colored Noise," Karl Gerlach, IEEE Trans. on AES, Vol. 27, No. 4, pp. 655-666, July 1991.



"Adaptive Cancellor and Pulse Compressor Interaction." Karl Gerlach, IEEE Trans. on AES, Vol. 27, No. 2, pp. 331-342, March 1991.

"Reciprocal Radar Waveforms." Karl Gerlach and F. F. Kretschmer, Jr., IEEE Trans. on AES, Vol. 27, No. 4, pp. 646-654, July 1991.

"A Minimax Approach to the Design of Doppler Filter." M. J. Steiner, IEEE Trans. on AES, Vol. 27, pp. 481-487, May 1991.

"Differentiating Similar Patterns Using a Weight-Decoy Term." Abraham Schultz, Journal Neural Network Computing, Vol. 2, No. 3, pp. 5-14, Jan. 1991.

"Twofold Continuity in Immersive Language Learning." Henry Hamburger and Tucker Maney, CALL, 4(2), 81-92, Intellect Publishing Co., April 1991.

"Registration of Multiple Overlapping Range Images: Scenes without Distinctive Features." Behrooz Kamgar-Parsi, Jeffrey L. Jones, and Azriel Rosenfeld, IEEE Transactions on Pattern Analysis and Machine Intelligence, 13(9), 857-871, IEEE Computer Society Press, September 1991.

"Topological Analysis of Satellite-Based Distributed Sensor Networks." C. M. Barnhart and R. E. Ziemer, IEEE Transactions on Systems, Man and Cybernetics, 21-No. 5 pp. 1060 - 1070, September/October 1991.

"Multilevel Secure Mixed-Media Communication Networks." Raymond Cole, Jr., Donald Kallgren, Richard Hale, John R. Davis, Proceedings of the IEEE Military Communications Conference, October 1991.\*

"Interface Styles for the Intelligent Cockpit: Factors Influencing Automation Deficit." J. Ballas, C. Heitmeyer and M. Perez, Proceedings, AIAA Computers in Aerospace 8 Conference, Baltimore, MD, pp. 657-667, October 21-24, 1991.\*

"Specifying Hard Real-Time Software: Experience with a Language and a Verifier." Proceedings, C.L. Heitmeyer and B. Labaw, IEEE Workshop on Real-Time Operating Systems and Software, Atlanta, GA, 15-17 May 1991.\*

"Interface Styles for Adaptive Automation." J. Ballas, C. Heitmeyer and M. Perez, Proceedings, Sixth Intern. Symposium on Aviation Psychology, Columbus, OH, April 29-May 1, 1991.\*

"Experiment to Evaluate Interface Styles for an Intelligent Cockpit with Adaptive Aiding." J. Ballas and C. Heitmeyer, Proceedings, CHI '91 Workshop on Advances in Computer-Human Interaction in Complex Systems, New Orleans, LA, 28-29 April 1991.\*

"Requirements Specification of Hard Real-Time Real-Time Computing." C. Heitmeyer and B. Labaw, A.van Tilborg, Ed., Kluwer, Academic Pub., Norwell, MA, 1991.

"Defining Formalism." C. Landwehr, J. McLean, and C. Heitmeyer, CACM 34, pp15-16, 10 Oct. 1991.

"Toward a Mathematical Foundation for Information Flow Security." James W. Gray, III, Proceedings of the 1991 IEEE Computer Society Symposium on Research in Security and Privacy, May, 1991.\*

- "On Information Flow Security Models." James W. Gray, III, Proceedings of the Computer Security Foundations Workshop IV, June 1991.\*
- "Aggregation Problems: A Position Paper." Catherine Meadows, Proceedings of the Third RADC Workshop on Database Security, pp. 83-95, May 1991.\*
- "A Dialog on Aggregation Problems." Dorothy Denning and Catherine Meadows, Proceedings of the Third RADC Workshop on Database Security, pp. 83-95, May 1991.\*
- "Policies for Dynamic Upgrading." Catherine Meadows, Database Security: Status and Prospects, IV, S. Jajodia and C. E. Landwehr, eds., pp. 241-250, 1991.
- "Fourth Meeting of IFIP WG 11.3: Report on Discussion." Catherine Meadows, Database Security: Status and Prospects, IV, S. Jajodia and C. E. Landwehr, eds., pp. 395-404, 1991.
- "A System for the Specification and Verification of Key Management Protocols." Catherine Meadows, Proceedings of the 1991 IEEE Computer Society Symposium in Research in Security and Privacy, May 1991.\*
- "Panel Discussion on the Polyinstantiation Problem: An Introduction." Catherine Meadows, Proceedings of the Fourth Computer Security Foundations Workshop, IEEE Computer Society Press, June 1991.\*
- "The NRL Protocol Analysis Tool: A Position Paper." Catherine Meadows, Proceedings of the Fourth Computer Security Foundations Workshop, IEEE Computer Society Press, June 1991.\*
- "Inference Control in Databases: Data Design vs. Query Processing." Catherine Meadows, Proceedings of the National Computer Security Conference, October 1991.\*
- "Policies for Dynamic Upgrading." Catherine Meadows, Database Security: Status and Prospects IV, pp. 241-250, 1991.
- "Fourth Meeting of IFIP WG 11.3: Report on Discussion." Catherine Meadows, Database Security: Status and Prospects IV, S. Jajodia and C. E. Landwehr, eds., pp. 395-404, 1991.
- "Variable Noise Effects Upon a Simple Timing Channel." Ira Moskowitz, Proceedings of the 1991 IEEE Computer Society Symposium on Research in Security and Privacy, May, 1991.
- "Analysis of a Storage Channel in the Two-Phase Commit Protocol." Ira Moskowitz, Proceedings of the Computer Security Foundations Workshop IV, June 1991.\*
- "Traveling on the Curved Earth." Ira Moskowitz, Navigation: Journal of the Institute of Navigation, Spring 1991.
- "Incomplete Weber Integrals of Cylindrical Functions." Ira Moskowitz and Allen Miller, Journal of the Franklin Institute, Vol. 328,#4,pp.445-457, July/August 1991.
- "The Use of Logic in the Analysis of Cryptographic Protocols." Paul Syverson, Proceedings of the 1991 IEEE Computer Society Symposium on Research in Security and Privacy, May, 1991.\*
- "The Value of Semantics for the Analysis of Cryptographic Protocols." Paul Syverson, Proceedings of the Computer Security Foundations Workshop IV, June 1991.\*
- "Aesthetic Sorting." Jeffrey K. Uhlmann, Applied Mathematics Letters, Vol. 4, No. 2, Jan. 1991.

"Visualizing Underwater Acoustic Matched-Field Processing." Rosenblum, L.J., B. Kamgar-Parsi, M. Karahalios, and R. Heitmeyer, Extracting Meaning from Complex Data (SPIE), V. 1459, 274-282, Feb. 1991.

"Visualizing Acoustic Pressure Fields." Lawrence C. Schuette, IEEE Computer Graphics and Applications, July, 1991.

"The Gravity Lens Illusion and its Mathematical Model." S. Naito, J. Cole, Proc. European Mathematical Society Group Meeting, Vienna, Austria, September 9-12, 1991.

"Adaptive Partitioning Strategies for Ternary Trees." Jeffrey K. Uhlmann, Pattern Recognition Letters, Vol. 12, Sep. 1991.

"A Lie Group Theoretic Approach to the Invariance Problem in Feature Extraction and Object Recognition." J. Cole, H. Murase, S. Naito, Pattern Recognition Letters, Vol. 12, pp. 519-523, September, 1991.

"The Statistical Mechanics of Image Recovery and Pattern Recognition." J. Cole, American Journal of Physics, Vol. 59, No. 9, pp. 839-842, September, 1991.

"The Statistical Mechanics of Image Recovery and Pattern Recognition." J. Cole, American Journal of Physics, Vol. 59, No. 9, pp. 839-842, September 1991.

"Computation of Acoustic Field Behavior Using a Lattice Gas Model." R. A. Krutar, S. K. Numrich, R. K. Squier, J. Pearson, G. Doolan, Oceans 91 Proceedings, Vol. 1., p.446-452, Oct. 1991 (0-7803-0202-8/91/0000-0446 -- 1991 IEEE) (refereed proceedings), 1991.\*

"Acoustic Imaging: The Reconstruction Of Small Objects." Rosenblum, L.J., B. Kamgar-Parsi, E. Belcher and O. Engelson, Proc. Visualization '91, 94-101, Oct. 1991.

"Acoustic Imaging: The Reconstruction Of Underwater Objects." L. Rosenblum, Behzad Kamgar-Parsi, E. Belcher, and O. Engelsen, Proc. IEEE Visualization '91, San Diego, CA, pp. 94-101, October 1991.\*

"Satisfying General Proximity/Similarity Queries With Metric Trees." Jeffrey K. Uhlmann, Info. Proc. Letters, Nov. 1991.

"Acoustic Scattering Form Finite Cylindrical Elastic Objects." Gererd Maze, Florence Lecroq, Dominique Decultot, Jean Ripoché, Susan K. Numrich, Herbert Uberall, J. Acoust. Soc. Am. 90 (6), p 3271-78, Dec. 1991.

"Signal Processing of Underwater Acoustic Data on a SIMD Machine." Wendell L. Anderson, George Lamb, William Smith, Book of Proceedings of UDC, 1991.\*

"Metric Trees." Jeffrey K. Uhlmann, Applied Math. Letters, Vol. 4, No. 5, 1991.

"A Simulation Environment for the Visualization of Multiple Sources Using Matched Field Processing Techniques." Lawrence C. Schuette, Richard Heitmeyer, Steven Chin, Proceedings of the 3rd International Conference on Computational Acoustics, 1991.\*

"Matching General Polygonal Arcs." Behzad Kamgar-Parsi, A. Margalit, and A. Rosenfeld, Computer Vision, Graphics, Image Processing: Image Understanding, Vol. 53, pp. 227-234, 1991.

"Broadband Multimode Raman Theory." M. Bashkansky and J. Reintjes, Proceedings of the CLEO/QELS Conference, May 12-17, 1991.\*

"Multiple O-Switched 2.1  $\mu\text{m}$  Laser Performance of Cr,Tm,Ho:YAG." M. Winings, S. Bowman, S. Searle, B. Feldman, CLEO '91 Technical Digest, May 12-17, 1991.

"Upconversion Studies of Cr,Tm,Ho:YAG." S. Bowman, M. Winings, and R. Auyeung, Proceedings of the Advanced Solid State Lasers Conference, March 18, 1991.

"Achromatic Multibeam Coupling in Photorefractive Crystals." W. Rabinovich, G. Gilbreath, and B. Feldman, Proceedings of the CLEO '91 Conference, May 12-17, 1991.\*

"Experimental Obser. of Period Doubling Suppress. & Nonlinear Dynamic Days Jfw 10/24/90 Parametric Effects In Strain Dynamics Of A Periodically Perturbed Magnetostrictive Ribbon" Vohra, Bucholtz, Koo, Dagenais, Houston, TX, January 6/9, 1991.

"All Fiber Modelocked Figure Eight Laser." I. Duling, OSA 90 JFW 10/31/90 Boston, MA, 4/9 November 1991

"Tri-Axial Fiber Optic Mag. for Towed Array." Dandridge, J. Underwater Acoustics, July 91. (CONFIDENTIAL)

"Fiber Optic Sensors for Navy Applications." Dandridge, IEEE J. Lightwave Comm. Syst., JFW 11/2/90, February 1991.

"Recent Progress & Current Trends In Fiber Optic Sensing." Kersey, OFC 91 Proceedings, San Diego, CA, JFW 11/2/90, February 1991.\*

"Phase Tuning of Linbo3 Interferometric Integrated Photonics Res.." Bulmer, Burns, Greenblatt, Monterey, CA, Apr.9/11, 1991.

"All-Fiber Ring Soliton Laser Modelocked with Optics Letters: A Nonlinear Mirror." I. Duling, JFW 11/27/90, Vol. 16, No. 8, April 1991.

"Universal Noise Rise in Magnetostrictive Physical Review" Vohra, Bucholtz, Koo, Letters Publ., JFW 12/12/90, June 1991.

"Model Evolution of Induced Second-Harmonic Light in an Optical Fiber." U. Osterberg (Dartmouth University), R. Lawconnell (F. Seiler Research Laboratory), C. Askins, L. Brambani (SFA), and E. Friebele, , Published in Optics Letters, Vol. 16, pp. 132-134, 1991.

"Determination of Trace Levels of Iron and Cobalt in Zirconium Fluoride Using Graphite Furnace Atomic Absorption Spectrometry." J. Jaganathan (GEO), K. Ewing, L. Peitersen (SFA), E. O'Brien (SFA), and I. Aggarwal, Published in Spectrochimica Acta, Vol. 46B, No. 5, pp. 669-671, 1991.

"Influence of Preform Surface Treatments on the Strength of Fluorozirconate Fibers." P. Pureza, P. Klein, W. Roberts (SFA), and I. Aggarwal, Published in the Journal of Materials Sciences, Vol. 26, pp. 5149-5154, 1991.

"Design Parameters for Fluoride Multimode Fibers." L. Busse and I. Aggarwal, Published in the Journal of Lightwave Technology, " Vol. 9, No.7, pp. 828-831, July 1991.

"Computer-Simulation Analysis of the ESR Spectra of V-Type Centers in Irradiated Heavy-Metal Fluoride Glasses." D. Griscom and E. Friebele, Physical Review B 43, 7427-7441, 1991.

"Thermo-Optic Coefficients of Some Standard Reference Material Glasses." J. Jewell, Published in the Journal of the American Ceramic Society. Vol. 74 [7], pp. 1689-1691, 1991.

"Separation of Intrinsic and Extrinsic Optical Absorption in ZBLAN Glasses." J. Jewell, I. Aggarwal, J. Jaganathan (GEO), G. Williams (Virginia Polytechnic Institute), and P. Greason (University of Dayton), Published in Applied Physics Letters, Vol. 59 No. 1, pp. 1-3, 1991.

"Correlation of Defect Centers with Wavelength Dependent Photosensitive Response in Germania-Doped Silica Optical Fibers." K. Simmons, S. LaRochelle, V. Mizrahi, G. Stegeman (University of Arizona), and D. Griscom, Published in Optics Letters, Vol. 16, pp. 141-143, 1991.

"Heterogeneous Platinum Nucleation and Crystallization of Heavy Metal Fluoride Glass." Jewell, J. Jaganathan (GEO), and I. Aggarwal, Published in Journal of the American Ceramic Society, Vol. 74[4] pp. 788-796, 1991.

"An Electron Spin Resonance Study of X-irradiated Calcium Aluminosilicate Glasses." D. Dutt (NRC-NRL Research Associateship), P. Higby and D. Griscom, Published in Journal of Non-Crystalline Solids, Vol. 130, pp. 41-51, 1991.

"Expansivity of Diboride-Particulate/Aluminum Composites." R. Everett, P. Higby, Published in Scripta Met., Vol. 25, pp. 625-630, 1991.

"Origin and Reduction of Scattering Losses in Fluoride Glasses and Fibers." I. Aggarwal, J. Sanghera (GEO), B. Harbison, L. Busse, P. Pureza, Published in Material Science Forum, Vols. 67 & 68, pp. 443-452, 1991.

"The Effect of UV Radiation on the Mechanical Strength of As<sub>2</sub>Se<sub>3</sub> Glass Fibers." F. Hulderman (G.D.), J. Sanghera (GEO), J. Mackenzie (UCLA), Published in Journal of Non-Crystalline Solids, Vol. 127, pp. 312-322, 1991.

"Chalcohalide Glasses." J. Heo (RU), J. Sanghera (GEO), J. Mackenzie (UCLA), Published in Optical Engineering, Vol. 30, pp. 470-479, 1991.

"Spectroscopy and Laser Operation of Nd:ZBAN Glass", R. Petrin (Oklahoma State University), M. Kliewer (Oklahoma State University), J. Beasley (Oklahoma State University), R. Powell (Oklahoma State University), I. Aggarwal, R. Ginther (SFA), Published in IEEE Journal of Quantum Electronics, Vol. 27, No. 4, pp. 1031-1038, 1991.

"Structural Relaxation Following Crystallization in High Purity GeO<sub>2</sub> Glass", T. Tsai (GEO), R. Pong (SFA), P. Higby, Vol. 131-133, pp. 1218, 1991.

"Dispersive Diffusive Transport of Free Excitons in High Purity Silica", T. Tsai (GEO), D. Griscom, Vol. 131-133, pp. 1240, 1991.

"Compositional Dependence of Trapped Hole Centers in Gamma-Irradiated Calcium Aluminosilicate Glasses." D. Dutt (NRC-NRL Research Associateship), P. Higby, C. Merzbacher, D. Griscom, Published in Journal of Non-Crystalline Solids, Vol. 135, pp. 122-130, 1991.

"The Effect of Gamma-Irradiation on the Density of Silica", J. Ruller (SFA), E. Friebele, Published in Journal of Non-Crystalline Solids, Vol. 136, pp. 163-172, 1991.

"Determination of Intrinsic Mid-IR Absorption of a Fluoride Glass", J. Jewell, I. Aggarwal, Published in Optics Letters, Vol. 16, No. 20, pp. 1554-1556, 1991.

"Si NMR and Infrared Reflectance Spectroscopy of Low-Silica Calcium Aluminosilicate Glasses", C. Merzbacher, K. McGrath, P. Higby, Published in Journal of Non-Crystalline Solids, Vol. 136, pp. 249-259, 1991.

"The Structure of Alkaline-Earth Aluminosilicate Glasses as determined by Vibrational Spectroscopy", C. Merzbacher, W. White (Penn. State University), Published in Journal of Non-Crystalline Solids, Vol. 130, pp. 18-34, 1991.

"Experimental Evidence for Excitonic Mechanism of Defect Generation in High-Purity Silica", T. Tsai (GEO), D. Griscom, Published in Physics Review Letter, 1991.

"Light Scattering Studies in ZBLAN-Glasses at High Temperatures", J. Schroeder (R.P.I), Luu-Gen Hwa (R.P.I), and Xue Shu-Zhado (R.P.I.), and L. Busse and I. Aggarwal, Published in Material Sciences Forum, Vols. 67 & 68, pp. 471-476, 1991.

"Effects of Oxygen Treatment on Fluoride Glass Light Scattering and Stability", B. Harbison, L. Busse, J. Sanghera (GEO), and I. Aggarwal, Published in Material Science Forum, Vols. 67 & 68, pp. 181-186, 1991.

"Fusion Splicing Heavy Metal Fluoride Glass Fiber", B. Harbison, W. Roberts (SFA), and I. Aggarwal, Published in Material Science Forum, Vols. 67 & 68, pp. 353-358, 1991.

"The Effect of Single Mode Fiber Cladding Composition on Low Dose Rate Radiation Response", E. Friebele, M. Putnam (University of Maryland Research Foundation), C. Askins, M. Gingerich, Published in the Technical Digest, ECOC 1991, pp. 337-340, 1991.

"Finite Element Analysis of Deformation in Large Optics due to Space Environment Radiation", C. Merzbacher, E. Friebele, J. Ruller (SFA), P. Matic, Published in the Proceedings of the Symposium on Optomechanics and Dimensional Stability, SPIE, Vol. 1533, pp. 222-228, 1991.\*

"Diamond Synthesis In Oxygen-Acetylene Flames in Homogeneities and the Effects of Hydrogen Addition", D.B. Oakes, J.E. Butler, K.A. Snail, W.A. Carrington, L.M. Hanssen, Published in Applied Physics, Vol. 69, p. 2602, 1991.

"Optical Matched Filter with Log-CFAR Detection", R.L. Denningham, R.D. Griffin, and J.N. Lee, Published in Appl. Opt., Vol. 30, No. 2, 181, January 10, 1991.

"Diamond And Non-Diamond Carbon Synthesis in an Oxygen-Acetylene Flame", L.M. Hanssen, K.A. Snail, W.A. Carrington, J.E. Butler, S. Kellogg and D. B. Oakes, Published in Thin Solid Films, Vol. 196, p. 271, 1991.

"High Temperature, High Rate Homoepitaxial Growth of Diamond in an Atmospheric Pressure Flame." K.A. Snail and L.M. Hanssen, Published in J. Crystal Growth, Vol. 112, p. 651, 1991.

"Synthesis of High Quality Diamond Films in a Turbulent Flame", K. A. Snail and C. Craigie, Published in Applied Phys., Vol. 58, p. 1, 1991.

"Dynamic Speckle Spatial Coherence Measurements Utilizing Single Mode Optical Fiber Probe", Published in J. Opt. Soc. America, Vol. 8, p. 1306, 1991.

"Advanced Channelization Technology for RF, Microwave, and Millimeterwave Applications", G.W. Anderson, D.C. Webb, A.E. Spezio, and J.L. Lee, Published in Proc. IEEE, Vol. 79, No. 3, March 1991.

"Hardware and Software System Design for Hybrid Optical-Electronic Signal Processing", R.D. Griffin and J.N. Lee, Presented at and Published in Digest of Summaries of OSA Topical Meeting on Optical Computing, Salt Lake City, UT, OSA 1991 Technical Digest Series, Vol. 6., 4-6 March 1991.

"Photorefractive Two Beam Coupling with White Light" W. Rabinovich and B. Feldman, Opt. Lettr, Vol. 16, No. 10, 1991.

"Propagation Under Turbulent Conditions Laser Beam Prop", S. Searles, G. Hart, J. Dowling, and S. Hanley, Applied Optics, Vol. 30, pp. 401-406, 1991.

"Spectral and Temporal Characteristic of Spontaneous Raman Scattering in the Transient Regime", M. Duncan, R. Mahon, L. Tankersley and J. Reintjes, JOSA B, 8, 2, p. 300, 1991.

"Second Stokes Generation in Deuterium", M. Duncan, R. Mahon, L. Tankersley and J. Reintjes, Optics Comm., 86, 1991.

"Tunable Laser Pumped 3 Micron Ho:YALO<sub>3</sub> Laser", W. Rabinovich, S. Bowman, M. Winings, B. Feldman, Published, IEEE, JQE, Vol. QE 27, No. 4, pp.895-897, 1991.

"Photochemical Bleaching of Absorbed Rhodamine 6G as a Probe of Binding Geometries on a Fused Silica Surface", A. Huston and C. Reimann, Chemical Physics, Vol. 149, pp. 401-407, 1991).

"Achromatic Multibeam Coupling in KNbO<sub>3</sub>:Rb", W. Rabinovich, G.C. Gilbreath and B. Feldman, Published in Optics Communications, Vol, 80, p. 317, 1991.

"Laser and Spectral Properties of Cr,Tm:Ho:YAG at 2.1 $\mu$ ", S. Bowman, M. Winings, R. Auyeung, S. Searles, and B. Feldman, Published in IEEE JQE, Vol. 27, No. 9, September 1991.

"Incoherent Multimode Raman Amplification Theory", M. Bashkansky and J. Reintjes, Published in JOSA B, 1843, 1991.

"Correlation Effects in Pump Depleted Broadband Stimulated Raman Amplification", M. Bashkansky and J. Reintjes, Opt. Commun, Vol. 83, p. 103, 1991.

"Correlation Effects in Pump Depleted Broadband Stimulated Raman Amplification", A.J. Campillo, J.D. Eversole, H-B Lin and C.D. Merritt, SPIE Vol 1497, pp. 78-89, June 1991.

"Cavity Quantum Electrodynamics Enhancement of Stimulated Emission in Microdroplets", A. Campillo, J. Eversole and H-B Lin, Physical Review Letters, Vol 67, No.4, pp.437-440, July 1991.

"Suppression of Photorefractive Beam Fanning", W. Rabinovich, G. Gilbreath, B. Feldman, Optics Letters, 1991.

"Time-Gated Imaging Through Scattering Media Using Stimulated Raman Amplification", M. Duncan, R. Mahon, L. Tankersley and J. Reintjes, Opt. Lett., 16, Vol. 23, p. 1868, 1991.

"Effect of Absorption on Microdroplet Resonant Emission Structure", P. Chylek, H-B. Lin, J. Eversole and A. Campillo, Published 16, 1723, November 15, 1991.

"Short Pulsed 2.1 $\mu$ m Laser Performance of Cr:Tm:Ho:YAG", S. Bowman, J. Winings, S. Searles, and B. Feldman, IEEE J. Quantum Elect., 27, No. 5, pp. 1129-1131, May 1991.

"Imaging Through a Low Light Level Raman Amplifier", M. Duncan, R. Mahon, L. Tankersley, J. Reintjes, SPIE Proceedings, Nonlinear Optics, Vol. 1409, 1991.\*

"Cavity OED Enhanced Spontaneous Emission and Lasing in Liquid Droplets", A. Campillo, J. Eversole, H-B Lin, C. Merritt, Published in conference proceedings at SPIE-The Internal Society for Optical Engineering in Dallas, TX, May 8, 1991.\*

"Resonant Faraday Rotation in Nd:YAG", B. Wexler, T. Colbert, B. Feldman, Presented to the IEEE Lasers and Electro-Optics Society 1991 Annual Meeting, San Jose, CA, Nov. 3-8, 1991.

"An Optically Pumped Tl Atomic Resonance Filter at 535 nm", B. Wexler, T. Colbert and B. Feldman, Presented to the LEOS '91 Annual Meeting, San Jose, Ca, Nov. 3-8, 1991.

"Nonlinear-Optical Coherent Gating for Medical Imaging With Lasers", M. Bashkansky and J. Reintjes, Presented to the 1991 OSA Annual Meeting, San Jose, CA, Nov. 3-8, 1991.

"Nonlinear Optical Susceptibility of CuCl Quantum Dot Glass", B. Justus, M. Seaver, J. Ruller and A. Campillo, SPIE Proceedings, Vol. 1409, 1991.\*

"Refractive Nonlinear Optical Power Limiter", A. Campillo, B. Justus, A. Huston, G. Swartzlander, Jr. Conference Proceedings of the First DoD Workshop on Optical Power Liquid Limiters, Washington, DC, Feb. 27-28, 1991.\*

"Condensation of Organic Vapors by Evaporating Water Drops", M. Seaver and J. Peele, Published in Conference Proceedings of the CRDEC Obscuration Sciences Meeting, Edgewood, MD, June 24-27, 1991.\*

"A Comparison of Flashpumped Cr:Tm 2- $\mu$ m Laser Action in Garnet Hosts", G. Quarles, J. Pinto and L. Esterowitz, SPIE OE/LASE '91 Conference, Los Angeles, CA and SPIE Proceedings, Solid State Lasers II, Vol. 1410, 1991.\*

"2.8 $\mu$ m Er<sup>3+</sup>:YLF<sub>4</sub> Laser Resonantly Pumped at 970nm", R. Stoneman, L. Esterowitz and J. Lynn, SPIE OE/LASE '91 Conference, Los Angeles, CA, January 1991.

"Suppression of Relaxation Oscillations in Flashpumped 2 $\mu$ m Lasers", J. Pinto and L. Esterowitz, SPIE OE/LASE '91 Conference, Los Angeles, CA, January 1991.

"Neural Net Discrimination of Infrared Missile and Clutter Events (U)", D. Scribner, M. Pauli and M. Colbert, IRIS Specialty Group Meeting on Targets, Backgrounds and Discrimination, Sandia National Labs., Albuquerque, NM, Published in Proceedings, January 1991.\*

"Reduction of Acoustic Transients in Tissue with a 2 $\mu$ m Thulium Laser", J. Pinto, L. Esterowitz and R. Bonner (National Inst. of Health), SPIE Laser Conference, and Publication in International Society for Optical Engineering, Los Angeles, CA, January 1991.



"Adaptive Nonuniformity Correction for IR Focal Plane Arrays using Neural Networks", D. Scribner, K. Sarkady, M. Kruer, J. Caulfield, Charles Herman (MRJ, Inc) and J. Hunt, SPIE Conference, and Publication in Proceedings, Vol. 1541, San Diego, CA, July 1991.\*

"Adaptive Nonuniformity Correction for IR Focal Plane Arrays using Neural Networks", D. Scribner, K. Sarkady, M. Kruer and J. Caulfield, J. Hunt and C. Herman (MRJ Inc), IRIS Detectors Symposium, National Institute of Standards, and Publication in Proceedings, Boulder, CO, 1991.\*

"Simultaneous CW Lasing at 1.46 $\mu$ m in Tm ZBLAN Fiber", R. Allen, L. Esterowitz and I. Aggarwal, LEOS 91 Conference, San Jose, CA, and Publication in Technical Digest, November 1991.

"Continuous Wave Modelocked 2 $\mu$ m Laser", J. Pinto, G. Rosenblatt and L. Esterowitz, LEOS 91 Conference, San Jose, CA, and Publication in Technical Digest, November 1991.

"Nonspiking Operation of Flashpumped 2 $\mu$ m Lasers", J. Pinto and L. Esterowitz, and Publication in OSA Proceedings, Vol. 7, OSA, 1991.\*

"Broad Tunability of Flashpumped, Tm-Activated Garnet Lasers", G. Quarles, J. Pinto and L. Esterowitz, and Publication OSA Proceedings Series, Vol. 7, OSA.\*

"Three-Level Lasers End-Pumped with Laser Diode Bars", J. Lynn, R. Stoneman and L. Esterowitz, and Publication in OSA Proceedings Series, Vol. 10, pp 167-171, 1991.\*

"Adaptive Nonuniformity Correction for Infrared Focal Plane Arrays Using Neural Networks", D. Scribner, K. Sarkady, M. Kruer, J. Gridley, J. Hunt, M. Colbert, and Charles Herman, IRIS Detectors Meeting, Boulder, CO and Publication in Proceedings, August 1991.\*

"Susceptibility of PV InSb FPA's to Frequency Doubled CO<sub>2</sub> Laser Irradiation (U)", C. Hoffman, F. Bartoli, R. Lindle and E. Youngdale, IRIS Infrared Detectors Meeting, Boulder, CO and Publication in Proceedings, August 1991.\*

"Degradation of IRFPA Performance and Uniformity due to Optical Overload and Jamming", K. Sarkady, J. Caulfield, J. Gridley, C. Hoffman, D. Scriber and M. Kruer, IRIS Infrared Detectors Meeting, Boulder, CO, and Publication in Proceedings, August 1991.\*

"Acoustic Noise Measurement in the Artic Utilizing All-Fiber Optic Hydrophones", Yurek, Tveten, Dandridge, JFW 1/22/91 IEEE Proceedings, Honolulu, HI, October 3/5, 1991.\*

Carruthers Responses of InP/GA0.47 In0.53 As/InP heterojunction Applied Physics Letters/Publ July \_91JFW 2/4/91

"Polarization Independent Interferometric Fiber", Kersey, Marrone, OFC Proceedings, San Diego, CA, Feb.19/22, 1991.\*

"Electronic Response of InP/InGaAs/InP Heterojunction Picosecond Elect. & Opto AD Bipolar Transistors to Ultrafast 0.62 & 1.53  $\mu$ m Optical Pulses Electronics", Carruthers, Salt Lake City, UT, March 13/15, 1991.

"Quantum Hall Effect in HgTe-CdTe Superlattices with Strong Three Dimensional Dispersion", C. Hoffman, J. Meyer and F. Bartoli, MBE Workshop, Austin, TX and for Publication Jour. Vac. Sci. and Tech., AIP, September 1991.

"Mechanisms of the Third-Order Nonlinear Optical Response in Phthalocyanines", J. Shirk, J. Lindle, F. Bartoli, Z. Kafafi, A. Snow and M. Boyle, ILS-VII Meeting (Nonlinear Optical Phenomena), and Publication in AIP Proceedings, Monterey, CA, September 1991.\*

"Adaptive Nonuniformity Correction for Infrared Focal Plane Arrays using Neural Networks", D. Scribner, K. Sarkady, M. Kruer, J. Gridley, J. Hunt, M. Colbert, and Charles Herman, Second Government Network Applications Workshop, Huntsville, AL, and for Publication in Proceedings, September 1991.\*

"Nonlinear Optical Properties of C<sub>60</sub> at 1.064 $\mu$ m", Z. Kafafi, J. Lindle, R. Pong, F. Bartoli, L. Lingg and J. Milliken, Published Proceedings of the 1st NLO Workshop on NLO Active Materials, Tokyo, Japan, October 1991.\*

"12 Watt Broad Area Semiconductor Amplifiers", Goldberg, Weller, Electronics Letters/Publication, JFW 3/6/91, May 1991.

"Visibility Limits in a Fiber Optic Michelson Interferometer", Marrone, Kersey, Electronics Letters/Publication, JFW 3/8/91, August 1991.

"Low Freq. Magnetic Field Mixing Near Period Doubling" Vohra, Bucholtz, Applied Physics Letters/Publication, JFW 3/20/91, July 1991.

"Characteristics of a Parametric Magnetostrictive Oscillator", Vohra, Bucholtz, IEEE Trans. on Magnetics AD, Publ. Nov. 91, Vol.27, No. 6, April 9, 1991.

"A Fiber Optic Dc & Low Freq. Electric Field Sensor", Vohra, Bucholtz, Optics Letters/Publication, JFW 4/19/91.

"Absolute strain sensing using fiber interferometry", Berkoff, Kersey, Proceedings, Fiber Optic Review Conf. JFW, 4/29/91.\*

"Multiplexed Interferometric Fiber Sensor Arrays", Dandridge, OE Fibers 91, Dist. & Multiplexed F.O.SJFW Boston, MA, 5/1/91.

"Fiber Optic Sensors", Dandridge, Yurek, Tveten, Short Course, Fiber Optic Sensors, JFW 5/1/91

"At Sea Noise Performance of an Aota Fm-Pgc", Dandridge, May 1991.

"At Sea Performance Of A Path Method Matched Differential Interfer", Dandridge, Yurek, Tveten, May 1991.

"Quick Look Report On The Lccs Demodulators Performance", Dandridge, Yurek, Tveten, May 1991.

"At Sea Self Noise Performance of a Reduced Diameter Fiber Optic Hydrophone For All Optical Towed Array Aota Applications", Yurek, Tveten, Dandridge, May 1991.

"Acoustic Noise Measurement In The Artic Utilizing All-Fiber Optic Oceans Hydrophones", Yurek, Tveten, Dandridge, Honolulu, HI, JFW 5/21/91.

"Interferometric Optical Fiber Sensors For Absolute Measurement of Displacement & Strain", Proceedings/Europ.Conf. , March 91.\*

"Propagation of Solitons in a Nonlinear Loop Mirror", Duling, Chen, Menyuk, San Jose, CA, U. of MD Proceedings Nov. 3/8. 1991.\*

"Nonplanar Ring Lasers for Microwave Fiber Sensor Applications", Williams, Kersey, OSA 91, San Jose, CA Proceedings, Nov. 3/8- 1991.\*

"A Tech. for Measuring Facet Reflectivity & Effective Electronics Index of Laser Diode Amplifiers", Goldberg, Tamburrini, Mehuy, Letters/Pub. Aug. 1991.

"Photorefractive Effects in Proton Exchanged Litao3 Optical Waveguides", Howerton, Burns, Lightwave Tech.JFW 6/28/91, V. 10, #2, Publ. Feb. 1991.

Bulmer"Lithium Niobate Waveguide Devices: Present Perf. & Future Applications", BOSTON, MA, SPIE, JFW 7/9/91, Proceedings Sept. 3/6, 1991.\*

"1.06 Um All Fiber Gyroscope W/Noise Subtraction", Moeller, Burns, Optics Letters, 1991.

"Dispersion in Rare Earth Doped Fibers", Duling, Optics Letters, Published, Vol.16, No. 24, December 1991.

"Periodic Filaments In Reflective Broad Area Semiconductor", Goldberg, Tamburrini, Mehuy, Applied Physics Ltrs.JFW 7/26/91, Optical Amp.Published, V.60, No. 11, March 1992.

"Lithium niobate waveguide devices: present perf. & future appl.", Bulmer, Tamburrini", Boston, MA, SPIE 1991, Sept.3/6/91, JFW 7/31/91.

"Demo. of Low Freq. Intensity Noise Reduction for Fiber Sensors", Dagenais, Koo, Dand, Photonics Tech. Ltrs., JFW 8/22/91.

"Compensated Fiber Optic Hydrophone" (CONFIDENTIAL), J.Bucaro, Lagakos, Dandridge, J. Lightwave, Tech. Publ., Vol. 9, No. 9, Sept.91.

"Single Channel Phase Tracker for the Open Loop Fiber Optic Gyroscope", Kersey, Moeller, Berkoff, Burns, Proc. of SPIE Conf. on F.O., Sept. 1991.

"Universal Parametric Effects Near Period Doubling Bifurcations", Burns, Vohra, Bucholtz, Proc. 1st. Experimental Chaos Conf.,JFW 10/24/91.

"Multiplexed Interferometric Fiber Sensor Arrays", Dandridge, Kersey, Proc. SPIE Symp. on OE Fibers, JFW 10/24/91.

"The Helium Abundance of Neptune from Voyager Observations." B. Conrath, D. Gautier, G. F. Lindal, R. E. Samuelson, and W. A. Shaffer, Journal of Geophysical Research, Vol. 96, Sup., pp,907-18,919, Oct. 1991.

"Electron Spin Resonance Studies of Point Defects and Magnetic Precipitates in Silica Glasses", D. Griscom, in Trans. American Crystallographic Association, Vol. 27, pp. 143-162 1991.

"Numerical Analysis of Finite Frequency Selective Surfaces with Rectangular Patches of Various Aspect Ratios", P.W.Grounds, J.K.Webb, IEEE Trans. on Antennas and Propagation, Vol. 39, pp569-575, May 1991.

"Advanced Channelization Technology for RF, Microwave and Millimeterwave Applications", Gordon W. Anderson, Denis C. Webb, Anthony E. Spezio, John N. Lee, Proceedings of The IEEE, Vol. 79, pp. 355-388, March 1991.\*

"Ship Wake Exploitation for Cruise Missile Guidance", Journal of Defense Research by Battelle for DARPA, Vol. 21, No. 1, pp. 1-34, November 1991.

"Nonlinear Modeling of Gated Range Tracker Dynamics with Application to Radar Range Resolution", IEEE Transactions on Aerospace and Electronic Systems, Vol 27-No.1, pp 68-82, January 1991.

"Structural Characteristics of -Helical Peptide Molecules Containing Aib Residues in Perspectives in Chemistry", I.L. Karle, P. Balaram, Vol. 2, p. 43, 1991.

"The Structural Investigation of Energetic Materials", R. Gilardi, J. Karle, Olah and Squire, Academic Press, pp. 1-26, 1991.

"Gas-Phase Metal Reactions", N.L. Garland, Fontijn, ed., Elsevier 1991.

"The Role of Energy in Ion-Molecule Processes in Fundamentals of Gas-Phase Ion Chemistry", D.C., Parent Jennings, ed., Kluwer Academic Publishers, 1991.

"Multiple Pulse Line Narrowing: Approaches for Solid State NMR Imaging", J.B. Miller, D.G. Cory, A.N. Garroway in Review of Progress in QNDE, 1991.

"Nonlinear Optical Properties of Substituted Phthalocyanines. Phthalonitrile Matrix Resins and Composites", J.S. Shirk, J.R. Lindle, F.J. Bartoli, Z.H. Kafafi, A.W. Snow, in American Chemical Society Symposium Series 455, Chapter 52, pp. 626-634, 1991.

"Thermal Marking of Amorphous Poly (Ethylene Terephthalate)", C.M. Roland, J.P. Armistead, M.F. Sonnenschein, in American Chemical Society Symposium Series 475, Clough and Shalaby, eds., pp. 343-363, 1991.

"X-Ray Backscatter Tomography for NDE of Steel Reinforced Rubber Domes", E.C. Greenawald, C.F. Poranski, D. Schafer in Review of Progress in Quantitative Nondestructive Evaluation, Thompson and Chimenti, eds., 10A, pp. 469-476, 1991.

"Diamond Chemical Vapor Deposition", F.G. Celii, J.E. Butler, in Ann. Rev. Phys. Chem., Vol. 42, p. 643, 1991.

"Messbauer Spectroscopy in Techniques for Characterization of Electrodes and Electrochemical Processes", J.I. Eldridge, W.E. O'Grady, Varma and Selman, eds., John Wiley and Sons, pp. 343-400, 1991.

"The Use of Partition Coefficients and Solubility Properties to Understand and Predict SAW Vapor Sensor Behavior", J.W. Grate, A.W. Snow, D.S. Ballantine, Jr., H. Wohltjen, M.H. Abraham, R.A. McGill, P. Sasson, in Microsensors, Muller et al., eds., IEEE PRESS, pp. 270-273, 1991.

"Microbial Aspects of Crude Oil Storage in Salt Dome Caverns", R.A. Neihof, H.N. Gilesin, Biodeterioration and Biodegradation, Rossmore, ed., Elsevier Applied Science, Vol. 8, pp. 125-137, 1991.

"Mossbauer Studies of Ultrathin Magnetic Films of Fe/Ag(100)", N.C. Koon, in Science and Technology of Nanostructured Magnetic Materials, Hadjipanayis and Prinz, eds., Plenum Press, 55, 1991.

"Accurate Intramolecular Forces Within a Gaussian-Orbital Local-Density Framework: Progress Towards Real Dynamics", M.R. Pederson, K.A. Jackson, in Density Functional Methods in Chemistry, J.K. Labanowski and J.W. Andzelm, eds., Springer-Verlag, p. 231, 1991.

"Anharmonic Oscillators in Quantum Mechanics: A Simple Normal-Form Approach", A.W. Sáenz, in Essays in Classical and Quantum Dynamics, J.A. Ellison and H. Überall, eds., Gordon and Breach, p. 163, 1991.

"Channeling Radiation of Electrons in Crystal Lattices", H. Überall, R. Fusina, A.W. Sáenz, in Essays in Classical and Quantum Dynamics, J.A. Ellison and H. Überall, eds., Gordon and Breach, p. 189, 1991.

"Physical Effects and Numerical Simulation of X-Ray Transport in Plasmas", J.P. Apruzese, in Computer Applications in Plasma Science and Engineering, Springer-Verlag, p. 359, 1991.

"Comments on Ionization Dynamics, Radiation Emission, and Dense Plasma Effects in Hot Plasmas", J. Davis, in Computer Applications in Plasma Science and Engineering, Springer-Verlag, p. 326, 1991.

"Symmetry and Stability Physics in Laser", S.E. Bodner, in Handbook of Plasma Physics, M.N. Rosenbluth and R.Z. Sagdeev, eds., Vol. 3, p. 247, 1991.

"Turbulence in Very-High Mach Number, Laser-Accelerated Material", J. Grun, J. Stamper, J. Crawford, C. Manka, B.H. Ripin, in Laser Interaction and Related Plasma Phenomena, H. Hora and G. Miley, eds., Vol. 9, p. 297, 1991.

"Charged Particle Beam Propagation", M. Lampe, G. Joyce, in Computer Applications in Plasma Science and Engineering, Springer-Verlag, p. 148, 1991.

"The Source Dependent Expansion Method and Radiation Focusing in the Free Electron Laser", A. Ting, P. Sprangle, C. Tang, in Computer Applications in Plasma Science and Engineering, A.T. Drobot, ed., p. 272, 1991.

"Photoreflectance Surface Characterization of InP:Fe Substrates", D.K. Gaskill, N. Bottka, A.K. Berry, in 6th Conference on Semi-Insulating III-V Materials, pp. 329-334, 1991.

"Photoresistive Response of Superconducting Thin Films", U. Strom, J.C. Culbertson, S.A. Wolf, in Science and Technology of Thin-Film Superconductors 2, pp. 449-458, 1991.

"Response Function Characteristics of Pairing Correlations in the New High Tc Superconductors", W. Jin, S.D. Mahanti, A.K. Rajagopal, in Studies of High Temperature Superconductors, 6, pp. 269-295, 1991.

"Chemistry and Technology of Evanescent Wave Biosensors", R.B. Thompson, F.S. Ligler, in Biosensors With Fiberoptics, Wise and Wingard, eds., The Humana Press, pp. 111-138, 1991.

"Liposome Encapsulated Hemoglobin: In Vivo Efficacy of a Synthetic Red Cell Substitute", B. Goins, R.O. Cliff, H. Spielberg, P. Hoffman, W. Phillips, R. Klipper, A.S. Rudolph, F.S. Ligler, in *Progress in Membrane Technology*, Gomez-Fernandez et al., eds, Birkhauser Verlag, pp. 214-227, 1991.

"Liposome Encapsulated Hemoglobin: Thirty Three Years in Biotechnology of Blood", J. Goldstein, ed., Butterworth, pp. 117-124, 1991.

"Corrosion in Metal Matrix Composites. Mechanisms and Properties", Trzaskoma, Vol. II, Chapter 13, p. 383, 1991.

"Characterization and Modification of Composite Interfaces in Metal Matrix Composites", B. Maruyama, E.V. Barrera, L. Rabenberg, *Processing and Interfaces*, Vol. I, Chapter 8, p. 181, 1991.

"Deposition Technologies for MMC Fabrication in Metal Matrix Composites", R.K. Everett, *Processing and Interfaces*, Vol. I, Chapter 5, p. 103, 1991.

"Diffusion Bonding in Metal Matrix Composites", R.K. Everett, *Processing and Interfaces*, Vol. I, Chapter 2, p. 17, 1991.

"Dynamic Mechanical Properties in Metal Matrix Composites", A. Wolfenden, J.M. Wolla, *Mechanisms and Properties*, Vol. II, Chapter 10, p. 287, 1991.

"In Situ Reinforcement of Metal Matrix Composites", D. Lewis III, *Processing and Interfaces*, Vol. I, Chapter 6, p. 121, 1991.

"Handbook of Calculated Electron Momentum Distributions, Compton Profiles and X-Ray Form Factors of Elemental Solids", N.I. Papanicolaou, N.C. Bacalis, D.A. Papaconstantopoulos, CRC Press, 1991.

"Thiasiazoles from Thiosemicarbazides", J.P. Scovill, D.L. Klayman, J.L. Flippen-Anderson, R. Gilardi, *Phosphorous, Sulfur and Silicon*, 63, pp. 273-281, 1991.

"A Macrocyclic Amide from Dehydrochlorination of Indole-3-carbonyl Chloride", J.E. Oliver, R.M. Water, W.R. Lusby, J.L. Flippen-Anderson, *J. Heterocyclic Chem.*, 28, pp. 569-572, 1991.

"Chiral Prodyes: Synthesis and Full Characterization of (S)-1-Phenylenthyl-amides of the Optically Active O-Methyldihydrofluoresceins", M. Brzostowska, A. Brossi, J.L. Flippen-Anderson, *Heterocycles*, 32(10), pp. 1969-1972, 1991.

"Crepe-Ribbon Representation for Protein Structures: Comparison of Phospholipases A2", N. Pattabiraman, K.B. Ward, *J. Mol. Graphics*, 9, pp. 3-10, 33, 1991.

"Crystal Structure and Molecular Structure of Mefloquine Methylsulfonate Monohydrate: Implications for a Malaria Receptor", J.M. Karle, I.L. Karle *Antimicrobial Agents and Chemotherapy*, 35, pp. 2238-2245, 1991.

"Crystal structure of [Leu]zervamicin, a Membrane Ion-Channel Peptide: Implications for Gating Mechanisms", I.L. Karle, J.L. Flippen-Anderson, S. Agarwalla, P. Balaram, *Proc. Natl. Acad. Sci. USA*, 88, pp. 5307-5311, 1991.

"Direct Calculation of Atomic Coordinates from Diffraction Intensities: Space Group P1", J. Karle, Proc. Natl. Acad. Sci. USA, 88, pp. 10099-10103, 1991.

"Effects of Hydration of Scale Factors for ab initio Force Constants", R.W. Williams, A.H. Lowrey, J., of Computational Chemistry, 12, pp. 761-777, 1991.

"Effects of Hydration on Scale Factors for ab initio Force Constants II", A.H. Lowrey, R.W. Williams, J. of Molecular Structure, 253, pp. 35-56, 1991.

"Electrochemical STM of Condensed Guanine on Graphite", R. Srinivasan, J.C. Murphy, R. Fainchtein, N. Pattabiraman, J. Electroanal. Chem., 312, pp. 293-300, 1991.

"Facile Synthesis and Nitration of cis-syn-cis-2,6-Dioxodecahydro-1H,5H-diimidazo[4,5-b:4',5'-el]pyrazine", M. Vedachalam, V.T. Ramakrishnan, J.H. Boyer, I.J. Dagley, K.A. Nelson, H.G. Adolph, R. Gilardi, C. George, J.L. Flippen-Anderson, J. Organic Chem., 56, pp. 3413-3419, 1991.

"Five 8,11-Substituted Pentacyclo Undecanes", J.L. Flippen-Anderson, C. George, R. Gilardi, W.W. Zajac, Jr., T.R. Water, A. Marchand, P.R. Dave, B.E. Arney, Jr., Acta Cryst., C47, pp. 813-817, 1991.

"Isolation and Characterization of Stereoisomers of Pentacoordinated Phosphorous Hydrolysis of Unsymmetrically Substituted Chiral Monocyclic Oxophosphoranes", R.M. Moriarty, J. Hiratake, K. Liu, A. Wendler, A.K. Awasthi, R. Gilardi, J. Amer. Chem. Soc., 113, pp. 9374-9376, 1991.

"Modular Design of Synthetic Protein Mimics Crystal Structure of Two Seven-Residue Helical Peptide Segments Linked by Epsilon-Aminocaproic Acid", I.L. Karle, J.L. Flippen-Anderson, M. Sukumar, K. Uma, P. Balaram, J. Amer. Chem. Soc., 113, pp. 3952-3956, 1991.

"New Alkoxides of Copper and the Alkaline and Alkaline-Earth Metals. Crystal Structure of  $\text{Na}_2\text{Cu}(\text{OCH}(\text{CF}_3)_2)_4$ ", A.P. Purdy, C.G. George, J.H. Callahan, Inorganic Chemistry, 30, pp. 2812-2819, 1991.

"Oxaporphine Alkaloids: Conversion of Lysicamine into Liriodendronine and Its 2-O-Methyl Ether, and Antifungal Activity", V. Pabuccuoglu, M.D. Rozwadowska, A. Brossi, A. Clark, C.D. Hufford, C. George, J.L. Flippen-Anderson, Arch. Pharm., 324, pp. 29-33, 1991.

"A Computer Program for an Automation Creation of NRL 3D Protein Sequence-Structure Database from the Protein Data Bank", M. Kusunoki, D.G. George, K. Namboodin, N. Pattabiraman, Protein Sequence and Data Analysis, 4, pp. 331-226, 1991.

"Primary and Secondary Neopentyl Arsines and Their Reactions with Trimethylgallium. Crystal and Molecular Structure of  $[\text{Me}_2\text{GaAs}(\text{CH}_2\text{CMe}_3)_2]_2$ ", J.C. Pazik, C. George, A. Berry, Inorganica Chimica Acta, 187, pp. 207-215, 1991.

"Reactions of Tris(bis(trimethylsilyl)amino) Aluminum with Ammonia and Thermolysis Studies", K.J.L. Paciorek, J.H. Nakahara, L.A. Hoferkamp, C. George, J.L. Flippen-Anderson, R. Gilardi, Chemistry of Materials, 3, pp. 82-87, 1991.

"Some Additional Features of One-Wavelength Anomalous Dispersion", J. Karle, Acta Cryst., A47, pp. 537-543, 1991.

"Structure of 1-Amino-3,5,7-Trinitroadamantane", R. Gilardi, C. George, J.L. Flippen-Anderson, W.W. Zajac, Jr., T.R. Walters, J.M. Woods, Acta Cryst., C47, pp. 1914-1916, 1991.

"Structure of 2,2-Dinitro-1,3-Propanediyl Bis(N-Pentafluorosulfanyl) Carbamate(I) and 2-Fluoro-2,2-Dinitroethyl (N-Pentafluorosulfanyl) Carbamate (II)", R. Gilardi, J.L. Flippen-Anderson, C. George, Acta Cryst., C47, pp. 442-445, 1991.

"Structure of Myrotoxin B Hydrate", C. George, R. Gilardi, J.L. Flippen-Anderson, Acta Cryst., C47, pp. 218-220, 1991.

"Structure of the Antimalarial (+)-Mefloquine Hydrochloride", J.M. Karle, I.L. Karle, Acta Cryst., C47, pp. 2391-2395, 1991.

"Structure of the Radiation Protection Agent S-2-(5-Aminopentylamino) ethylphosphorothioic Acid (WR 2823)Dihydrate", J.M. Karle, I.L. Karle, Acta Cryst., C47, pp. 1231-1245, 1991.

"Structures of 1,2-Ethanediammonium Dinitrate (1) and 1,3-Propanediammonium Dinitrate (2)", C. George, R. Gilardi, J.L. Flippen-Anderson, Acta Cryst., C47, pp. 2713-2715, 1991.

"Surface Characterization of Multilayer X-ray Diffraction Specimens", P.G. Burkhalter, D.B. Brown, J.V. Gilfrich, J.H. Konnert, P. D'Antonio, H. Rosentock, L.M. Shirey, J. Vac. Sci. Technol., B9, pp. 845-852, 1991.

"Synthesis and Properties of 1,2-Difluorodinitroethylene", K. Baum, T.G. Archibald, D. Tzeng, R. Gilardi, J.L. Flippen-Anderson, C. George, J. Org. Chem., 56, pp. 537-539, 1991.

"Synthesis of 2-exo- and 2-endo-Mecamylamine Analogues Structure-Activity Relationships for Nicotinic Antagonism in the Central Nervous System", J.A. Suchock, T.J. Martin, B.R. Martin, E.L. May, C. George, J. Medicinal Chem., 34, pp. 1003-1010, 1991.

"Synthesis, Stereochemistry, and Biological Activity of the 1-(1-Phenyl-2-methylcyclohexyl)piperidines and the 1-(1-Phenyl-4-methylcyclohexyl)piperidines. Absolute Configuration of the Potent trans-(-)-1-(1-Phenyl-2-methylcyclohexyl)piperidine", M.A. Iorio, L. Tomassini, M.V. Mattson, C. George, A.E. Jacobson, J. of Med. Chem., 34, pp. 2615-2522, 1991.

"Utilization of STEM Nanodiffraction Data", J. Konnert, P. D'Antonio, Ultramicroscopy, 38, pp. 169-179, 1991.

"Volatile Copper and Barium-Copper Alkoxides Crystal Structure of a Tricoordinate Copper (II) Complex. Ba Cu[OCMe(CF<sub>3</sub>)<sub>2</sub>]<sub>3</sub>2", A.P. Purdy, C. George, Inorganic Chemistry, 30, pp. 1969-1970, 1991.

"A Fast Switching Ferroelectric Side-Chain Liquid Crystalline Polymer and Copolymer", J. Naciri, S. Pfeiffer, R. Shashidhar, Liquid Crystal, 10(4), 585, 1991.

"Activity of Choline Oxidase Monitored In Situ with an Unmodified Glassy Carbon Electrode", J.Z. Stemple, K.M. Rusin, T.L. Fare, Analytical Chemistry, 63(10), 1050, 1991.

"Autonulling a.c. Bridge for Accurate Measurement of Small Impedance Variations Using MOS Components", P.P. Bey, Jr., M.D. Levine, D.J. Yonce, T.L. Fare, Review of Scientific Instruments, 62(12), 3082-3088, 1991.



"Controlled Release from Cylindrical Microstructures", R.R. Price, M. Patchan, J. of Microencapsulation, 8(3), 301-306, 1991.

"Crossover From Three-Dimensional XY to Tricritical Behavior for the Nematic-Smectic-A1 Phase Transition", G. Nounesis, C.W. Garland, R. Shashidhar  
Physical Review A, 43(4), 1849, (1991)

Deep UV Photochemistry of Chemisorbed Monolayers: Fabrication and Applications of Patterned Co-Planar Molecular Assemblies", C.S. Dulcey, J.H. Georger, Jr., V. Krauthamer, D.A. Stenger, T.L. Fare, J.M. Calvert  
Science, 252, 551-554, 1991.

"Diacetylenic Lipid Microstructures: Structural Characterization by X-ray Diffraction and Comparison With the Saturated Phosphatidylcholine Analog", M. Caffrey, K. Hogan, A.S. Rudolph, Biochemistry, 300, 2134-2146, 1991.

"Dipole Interactions in Electrofusion", D.A. Stenger, K.V.I.S. Kaler, S.W. Hui, Biophysical Journal, 59, 1074-1084, 1991.

"Evidence of Pronounced Positional Order at the Graphite-Liquid Crystal of a Bulk Nematic Material", S.L. Brandow, D.P. DiLella, R.J. Colton, R. Shashidhar, J. Vac. Sci. Technol., B9(2), 1115, 1991.

"Formation Threshold and Structural Evolution of Molybdenum Nanocrystals with Sputtering Pressure", G.M. Chow, C.L. Chien, A.S. Edelstein, Journal of Materials Research, 6, 08, 1991.

"Immobilization of Acetylcholinesterase on Solid Surfaces: Chemistry and Activity Studies", S.K. Bhatia, T.L. Fare, M.J. Cooney, L. Shriver-Lake, F.S. Ligler, Sensors & Actuators, B3, 311-317, 1991.

"In Vivo Biodistribution of a Radiolabelled <sup>99m</sup>Tc-Labelled Liposome Encapsulated Hemoglobin in an Anesthetized Rabbit", A.S. Rudolph, R.W. Klipper, B. Goins, W.T. Phillips, Proceedings of National Academy of Science, 88, 10976-10980, 1991.\*

"L-Proline Modified Nylons", H. S.-W. Hu, J.R. Campbell, J.R. Griffith, Polymer Preprints, 32(1), 543, 1991.

"Langmuir-Blodgett Deposited Valinomycin-Phospholipid Films on Platinum: An a.c. Impedance Response to Potassium", T.L. Fare, K.M. Rusin, P.P. Bey, Jr., Sensors & Actuators, B 3(1), 51-62, 1991.

"Liquid Crystalline Behavior of Benzobisthiazole(BBT) Derivatives as a Rigid-Rod Polymer Model", O.-K. Kim, H.S. Lee, T.H. Yoon, R. Shashidhar, Liquid Crystals, 10(5), 725-731, 1991.

"Liquid Crystalline Phases of a Diacetylenic Phosphocholine Lipid", M. Nagumo, B.R. Ratna, J. Naciri, R. Shashidhar, Molecular Crystals and Liquid Crystals, 206, 123-130, 1991.

"Liquid Crystalline Phases of a Diacetylenic Phosphocholine Lipid", M. Nagumo, B.R. Ratna, S. Qadri, J. Naciri, R. Shashidhar, Molecular Crystals and Liquid Crystals, 206, 123, 1991.

"Measurements of Vacuum Field Emission From Bio/Molecular and Semiconductor-Metal Eutectic Composite Microstructures", D.A. Kirkpatrick, P.E. Schoen, W.B. Stockton, R. Price, S. Baral, B. Khan, J.M. Schnur, IEEE Transactions on Plasma Science, 19, 749-756, 1991.

"Modulation of a Gated Ion Channel Admittance in Lipid Bilayer Membranes", D.A. Stenger, D.H. Cribbs, T.L. Fare, *Biosensors & Bioelectronics*, 6, 425-430, 1991.

"Monolayers and Langmuir-Blodgett Films of a Ferroelectric Side Chain Polymer and Its Constituent Mesogen", W. Rettig, J. Naciri, R. Shashidhar, R.S. Duran, *Macromolecules*, 24, 6539-6541, 1991.

"New Surface Imaging Techniques for Sub-0.5 Micrometer Optical Lithography", J.M. Calvert, C.S. Dulcey, J.H. Georger, M.C. Peckerar, G.S. Calabrese, P. Sricharoenchaikit, *Solid State Technology*, 34, 77-82, 1991.

"Novel Trifunctional Carrier Molecule for the Fluorescent Labeling of Haptens", R. Bredehorst, G.A. Wernhoff, A.W. Kusterbeck, P.T. Charles, R.B. Thompson, F.S. Ligler, C.W. Vogel, *Analytical Biochemistry*, 193, 001-008, 1991.

"Self-Arrangement of Molybdenum Particles into Cubes", A.S. Edelstein, G.M. Chow, E.I. Altman, R.J. Colton, D.M. Hwang, *Science*, 25, 1590-1592, 1991.

"Self-Assembling Phospholipid Filaments", A.S. Rudolph, B.R. Ratna, B. Khan *Nature*, 352, 52, 1991.

"Self-Assembling Properties of 1,2 Diacyl-sn-Glycero-3-Phosphohydroxyethanol: A Head Group Modified Diacetylenic Phospholipid", A. Singh, M. Markowitz, *Langmuir*, 7(2), 16-18, 1991.

"Sputtering Synthesis and Properties of Molybdenum Nanocrystals and Al/Mo Layered Nanocomposites", G.M. Chow, A. Pattnaik, T.E. Schlesinger, R.C. Cammarata, M.E. Twigg, A.S. Edelstein, *Journal of Materials Research*, 6(4), 737-743, 1991.

"Structure of Polymerizable Lipid Bilayers II: Two Heptacosadiynoyl Phosphatidylcholine Isomers", S.L. Blechner, W. Morris, P.E. Schoen, P. Yager, A. Singh, D.G. Rhodes, *Chemistry and Physics of Lipids*, 58(12), 41-45, 1991.

"Structure of Polymerizable Lipid Bilayers IV: Mixtures of Long Chain Diacetylenic and Short Chain Saturated Phosphatidylcholines and Analogous Asymmetric Isomers", D.G. Rhodes, A. Singh, *Chemistry and Physics of Lipids*, 59, 215-224, 1991.

"The Effect of Hydration Stress Solutes on Hydrated Dipalmitoyl Phosphatidylcholine", A.S. Rudolph, B. Goins, *Biochim. Biophys. Acta*, 1066, 90-94, 1991.

"The Process-Controlled Magnetic Properties in Nanostructured Co/Ag Composite Films", S.H. Liou, Z.S. Shan, D.J. Sellmyer, S. Nafis, J.A. Woolam, C.P. Reed, R.J. DeAngelis, G.M. Chow, *Journal of Applied Physics*, 70(10), 5882, 1991.

"Unusual Smectic-A Layering in a Homologous Series of Isothiocyanato Compounds", G. Heppke, S. Pfeiffer, A. Ranft, R. Shashidhar, *Molecular Crystals and Liquid Crystals*, 206, 230, 1991.

"50-Nanometer Linewidth Platinum Sidewall Lithography by Effusive-Source Metal Precursor Chemical Deposition and Ion-Assisted Etching", D.S.Y. Hsu, *Appl. Phys. Lett.*, 59, 2192, 1991.

"A Comparative Study of the Reaction Dynamics of a Model System Using Different Criteria in Parameterizing the Potential Energy Function", B.M. Rice, C.F. Chabalowski, G.F. Adams, R.C. Mowrey, M. Page, *Chem. Phys. Lett.*, 184, 335, 1991.

"Absolute Rate Constants for the Reaction of CN with CH<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, and C<sub>3</sub>H<sub>8</sub> from 292 to 1500K Using High Temperature Photochemistry", R.J. Balla, K.H. Casleton, J.S. Adams, L. Pasternack, J. Phys. Chem., 95, 8694, 1991.

"AIH Gas-Phase Reaction Kinetics", L. Pasternack, J.K. Rice, J. Phys. Chem., 95, 8701, 1991.

"Atomistic Mechanisms of Adhesion and Compression of Diamond Films", J.A. Harrison, D.W. Brenner, C.T. White, R.J. Colton, Thin Solid Films, 206, 213, 1991.

"Characterization of Cluster Ions Produced by the Sputtering or Direct Laser Vaporization of Group 13 Metal (Al, Ga and In) Oxides", F.L. King, B.I. Dunlap, D.C. Parent, J. Chem. Phys., 94, 2578, 1991.

"Charge-Remote Fragmentation: Mechanistic and Energetic Considerations", V.H. Wysocki, M.M. Ross, Int. J. Mass Spec. and Ion Proc., 104, 179, 1991.

"Chemical Ionization of Fullerenes", S.W. McElvany, J.H. Callahan, J. Phys. Chem., 95, 6186, 1991.

"Collision-Induced Intersystem Crossing in NH(a<sub>1</sub> ) NH(X<sub>3</sub> -)", J.S. Adams, L. Pasternack, J. Phys. Chem., 95, 2975, 1991.

"D-D (H-H) Interactions within Interstices of Pd", C.T. White, D.W. Brenner, R.C. Mowrey, J.W. Mintmire, P.P. Schmidt, B.I. Dunlap, Jap. J. of Appl. Phys., 30, 182, 1991.

"Determination of the Ionization Potentials of Aluminum Oxides Via Charge Transfer", S.W. McElvany, S.B.H. Bach, J. Phys. Chem., 95, 9091, 1991.

"Direct Measurement of Rate Constants for the Reactions of CH and CD with HCN and DCN", S. Zabarnick, J.W. Fleming, M.C. Lin, Chem. Phys., 150, 109, 1991.

"Dissociations of Singly- and Multiply-Charged Fullerene Ions", R.J. Doyle, Jr., M.M. Ross, J. Phys. Chem., 95, 4954, 1991.

"Dissociative Adsorption and Associative Desorption of H<sub>2</sub> on a Flat Surface", R.C. Mowrey, B.I. Dunlap, Int. J. Quantum Chem., 525, 641, 1991.

"Structure and Dynamics of Bulk Polymers by NMR Methods", A.N. Garroway", Journal of American Chemical Society, 113, pp. 782-788, 1991.

"Formation and Characterization of C<sub>60</sub>He<sup>+</sup>", M.M. Ross, J.H. Callahan, J. Phys. Chem., 95, 5720, 1991.

"Formation of the Gas-Phase Aluminum Sulfide Cations Al<sub>x</sub>S<sub>y</sub><sup>+</sup> and their Reaction with NO<sub>2</sub>", D.C. Parent, Chem. Phys. Lett., 183, 45, 1991.

"Geometric and Electronic Structures of C<sub>60</sub>H<sub>36</sub>, C<sub>60</sub>H<sub>60</sub>, and C<sub>60</sub>F<sub>60</sub>", B.I. Dunlap, D.W. Brenner, R.C. Mowrey, J.W. Mintmire, C.T. White, J. Phys. Chem., 95, 5763, 1991.

"Ground State and Vertical Ionization Energies Versus Si-Si-Si and C-C-C Bond Angles in Si<sub>3</sub>H<sub>8</sub> and C<sub>3</sub>H<sub>8</sub>", J.V. Ortiz, J.W. Mintmire, J. Phys. Chem., 95, 8609, 1991.

"Group IV Covalent Clusters: Si<sub>45</sub> and C<sub>44</sub> versus Si<sub>44</sub> and C<sub>45</sub>", D.W. Brenner, B.I. Dunlap, J.A. Harrison, J.W. Mintmire, R.C. Mowrey, D.H. Robertson, C.T. White, Phys. Rev. B, 44, 3479, 1991.

"Incident Ion Energy Effects on the Secondary Rh<sup>+</sup> Ion Kinetic Energy and Azimuthal Angle Distributions from Rh {111}", G.P. Malafsky, N. Winograd, Surf. Sci., 257, 41, 1991.

"Inelastic Molecule-Corrugated Surface Scattering Using the Close-Coupling Wave Packet Method", R.C. Mowrey, D.J. Kouri, Computer Physics Communications, 63, 100, 1991.

"Infrared Studies of the Combustion of Methanol and Methanol/Tetramethyldisiloxane Solutions", C.H. Douglass, S.M. Drake, H.D. Ladouceur, J. Phys. Chem., 95, 5198, 1991.

"Interpretation of the Carbon Auger Line Shapes for the Adsorption and Decomposition of Ethylene on Ni (100)", F.L. Hutson, D.E. Ramaker, B.E. Koel, C. Gebhard, Surf. Sci., 248, 119, 1991.

"Interpreting the Near Edges of O<sub>2</sub> and O<sub>2</sub><sup>-</sup> in Alkali-Metal Superoxides", M.W. Ruckman, J. Chem. Phys., S.L. Qiu, P. Kuiper, M. Strongin, B.I. Dunlap, Phys. Rev. Lett., 67, 2533, 1991.

"Local-Density Functional Electronic Structures of Three Stable Icosahedral Fullerenes", B.I. Dunlap, D.W. Brenner, J.W. Mintmire, R.C. Mowrey, C.T. White, J. Phys. Chem., 95, 8737, 1991.

"Local-Density Functional Photoelectron Spectra of Fullerenes", J.W. Mintmire, B.I. Dunlap, D.W. Brenner, R.C. Mowrey, C.T. White, Phys. Rev. B, 43, 14281, 1991.

"Magic Number Carbon Clusters: Ionization Potentials and Selective Reactivity", J.A. Zimmerman, J.R. Eyler, S.B.H. Bach, S.W. McElvany, J. Chem. Phys., 94, 3556, 1991.

"Mixed Aluminum and Indium Oxide Cations: Controlling Reactivity", D.C. Parent, Chem. Phys. Lett., 183, 51, 1991.

"Modeling the Growth of Semiconductor Epitaxial Films via Nanosecond Time-scale Molecular Dynamics Simulations", D.W. Brenner, D. Srivastava, B.J. Garrison, Langmuir, 7, 683, 1991.

"Molecular Dynamics Simulations of the Nanometer-Scale Mechanical Properties of Compressed Buckminsterfullerene", D.W. Brenner, J.A. Harrison, C.T. White, R.J. Colton, Thin Solid Films, 206, 220, 1991.

"Non-Statistical CO Product Distribution from the Hot H-Atom Reaction. H+CO<sub>2</sub> → OH+CO", J.K. Rice, A.P. Baronavski, J. Chem. Phys., 94, 1006, 1991.

"Paramagnetism of High Nuclearity Metal Cluster Compounds as Derived from Local Density Functional Calculations", N. Rosch, L. Ackermann, G. Pacchioni, B.I. Dunlap, J. Chem. Phys., 95, 7004, 1991.

"Reactive Scattering using Efficient Time-Dependent Quantum Mechanical Wave Packet Methods on an L-shaped Grid", R.C. Mowrey, J. Chem. Phys., 94, 7098, 1991.

"Second Derivatives of the Local-Density-Functional Total Energy When the Local Potential is Fitted", B.I. Dunlap, J. Andzelm, Phys. Rev. A., 45, 10537, 1991.

"Simulations of C60 with a Hydrogen-Terminated Diamond {111} Surface", R.C. Mowrey, D.W. Brenner, B.I. Dunlap, J.W. Mintmire, C.T. White, *J. Phys. Chem.*, 95, 7138, 1991.

"Spectroscopic Evidence for Carbon-Carbon Bonding in "Carbide" Layers on Metals", F.L. Hutson, D.E. Ramaker, B.E. Koel, *Surf. Sci.*, 243, 104, 1991.

"Submonolayer Cluster Formation at the Ge/Al<sub>2</sub>O<sub>3</sub> (1102) Interface", G.P. Malafsky, *Surf. Science*, 249, 159, 1991.

"Surface-Induced Dissociation in Tandem Quadrupole Mass Spectrometers: A Comparison of Three Designs", V.H. Wysocki, J.H. Callahan, F.L. King, *J. Am. Soc. for Mass Spectrometry*, 3, 27, 1991.

"Symmetry and Ferromagnetic Clusters", B.I. Dunlap, *Z. Phys. D.*, 19, 255, 1991.

"Temperature Dependence of CH(CD) + D<sub>2</sub> Reaction Kinetics", C.T. Stanton, N.L. Garland, H.H. Nelson, *J. Phys. Chem.*, 95, 1277, 1991.

"Temperature Dependence of the Kinetics of the Reaction BO + H<sub>2</sub> HBO + H", N.L. Garland, H.H. Nelson, M.J. Page, C.T. Stanton, *J. Chem. Phys.*, 95, 2511, 1991.

"Temperature Dependence of the Kinetics of the Reaction BO + O<sub>2</sub>", C.T. Stanton, N.L. Garland, H.H. Nelson, *J. Phys. Chem.*, 95, 8741, 1991.

"The Endohedral Vibrations of Na<sup>+</sup> in C<sub>60</sub>", P.P. Schmidt, B.I. Dunlap, C.T. White, *J. Phys. Chem.*, 95, 10537, 1991.

"The Gas-Phase Dissociation of a New Polyazapolycyclic Nitramine: Hexanitrohexaazaisowurtzitane", R.J. Doyle, Jr., *Organic Mass Spectrometry*, 26, 723, 1991.

"Thermal and Oxidative Analyses Buckminsterfullerene, C<sub>60</sub>", J. Milliken, T.M. Keller, A.P. Baronavski, S.W. McElvany, J.H. Callahan, H.H. Nelson, *Chemistry of Materials*, 3, 386, 1991.

"<sup>29</sup>Si NMR and Infrared Reflectance Spectroscopy of Low-Silica Calcium Aluminosilicate Glasses", K.J. McGrath, C.I. Merzbacher, P.L. Higby, *J. NonCrystalline Solids*, 136, 249, 1991.

"Anionic Copolymerization of Bis lactone End-Capped Diols with the Diglycidyl Ether of Bisphenol A", R.F. Brady, Jr., A.M. Sikes, *Macromolecules*, 24, 688, 1991.

"Characterization of Radical Defects from Abrasion and U.V.-Photolysis of Poly(ethylene terephthalate) Fibres", M.D. Pace, C.M. Roland, *Polymer*, 32, 1027, 1991.

"Dynamical Heterogeneity in a Miscible Polymer Blend", C.M. Roland, K.L. Ngai, *Macromolecules*, 24, 2261, 1991.

"Electrical Conductivity in Rubber Double Networks", C.M. Roland, K.L. Peng, *Rubber Chemistry and Technology*, 64, 721, 1991.

"Epoxy Anticorrosion Coatings for Copper-Nickel Piping", R.F. Brady, Jr., *Surface Coatings Australia*, 28 (5), 1213, 1991.

- "EPR Spectra of Photochemical NO<sub>2</sub> Formation in Monocyclic Nitramines", M.D. Pace, J. Phys. Chem., 95, 5858, 1991.
- "Generation of Short, Intense Gradient Pulses", M.S. Conrad, A.N. Garroway, D.G. Cory, J.B. Miller, J. Mag. Resonance, 94, 370, 1991.
- "Growth and Characterization of Thin Films of Thallium (III) Oxide by Organometallic Chemical Vapor Deposition", A.D. Berry, R.T. Holm, R.L. Mowery, N.H. Turner, M. Fatemi, Chemistry of Materials, 3, 72-77, 1991.
- "High Temperature Crystallization of Poly(Ethylene Terephthalate)", C.M. Roland", Polymer Eng. and Science, 31, 849, 1991.
- "Liquid-Crystalline Behavior of Benzobisthiazole Derivatives as a Rigid Rod Polymer Model", O.K. Kim, H.S. Lee, T.H. Yoon, R. Shashidhar, Liquid Crystals, 10, 725, 1991.
- "New Alkoxides of Cu and the Alkaline and Alkaline-Earth Metals: Na<sub>2</sub>Cu[OCH(CF<sub>3</sub>)<sub>2</sub>]<sub>4</sub>", A.P. Purdy, C.F. George, J.H. Callahan, Inorg. Chem., 30, 2812, 1991.
- "Nonlinear Optical Studies on Transition Metal Complexes of Aminobenzenethiol", Z.H. Kafafi, J.R. Lindle, C.S. Weisbecker, F.J. Bartoli, J.S. Shirk, T.H. Yoon, O.K. Kim, Chem. Phys. Letters, 179, 7984, 1991.
- "Primary and Secondary Neopentyl Arsines and Their Reactions With Trimethylgallium Crystal and Molecular Structure of [Me<sub>2</sub>GaAs(CH<sub>2</sub>CMe<sub>3</sub>)<sub>2</sub>]<sub>2</sub>", J.C. Pazik, C. George, A. Berry, Inorg. Chimica Acta, 187, 207, 1991.
- "Segmental Relaxation and Molecular Structure in Polybutadienes and Polyisoprene", C.M. Roland, K.L. Ngai, Macromolecules, 24, 5315, 1991.
- "Synthesis and Evaluation of Hexafluorodimethylcarbinol Functionalized Polymers as Microsensor Coatings", A.W. Snow, L.G. Sprague, R.L. Soulen, J.W. Grate, H. Wohltjen, J. Appl. Poly. Sci., 43, 1659, 1991.
- "Synthesis of Oligomeric Imide-Containing Phthalonitriles", T.M. Keller", Polymer Communications, 32, 132, 1991.
- "Techniques for NMR Imaging of Solids", J.B. Miller, Trends in Analytical Chemistry, 10, 5964, 1991.
- "The onset of Orientational Crystallization in Polyethylene terephthalate) During Low Temperature Drawing", C.M. Roland, M.F. Sonnenschein, Polymer Eng. and Science, 31, 1434, 1991.
- "The Synthesis and Attempted Polymerization of an Trifluorostyrene Disubstituted by Hexafluoro-2-Propanol Groups", L.G. Sprague, A.W. Snow, J.R. Griffith, J. Fluorine Chem., 52, 301, 1991.
- "Thermal Crystallization of Polytetrahydrofuran Networks", C.M. Roland, G.S. Buckley, Rubber Chem. and Technology, 64, 74, 1991.
- "Volatile Copper and Barium-Copper Alkoxides. Crystal Structure of a Tricoordinate Copper(II) Complex. Ba Cu[OCMe(CF<sub>3</sub>)<sub>2</sub>]<sub>3</sub> 2", A.P. Purdy, C.F. George, Inorg. Chem., 30, 1970, 1991.

- "A Role for Plastic Flow in Ambient Temperature Cracking Behavior at Hardness Indentations in Silicon Crystals", H. Shin, I.L. Singer, R.W. Armstrong, *J. Material Science*, 26, 3486, 1991.
- "Activity of Choline Oxidase Monitored in Situ with an Unmodified Glassy Carbon Electrode", J.Z. Stemple, K.M. Rusin, T.L. Fare, *Anal. Chem.*, 63, 1050, 1991.
- "Adsorption of a Metal Deactivator Additive onto Metal Surfaces", J.A. Schreifels, R.E. Morris, N.H. Turner, R.L. Mowery, S.M. Hues, *Energy & Fuels*, 5, 263, 1991.
- "Adsorption of a Metal Deactivator onto Metal Surfaces", J.A. Schreifels, R.E. Morris, N.H. Turner, R.L. Mowery, S.M. Hues, *Energy and Fuels*, 5, 263, 1991.
- "Analytical Implications of Zeolites in Overlayers at Electrodes", D.R. Rolison, R.J. Nowak, T.A. Welsh, C.G. Murray, *Talanta*, 38, 27, 1991.
- "Chromogenic Substrates for Horseradish Peroxidase", S.M. Conyers, D.A. Kidwell, *Analytical Biochemistry*, 192, 207, 1991.
- "Detection of Atomic Nitrogen by Third Harmonic Generation", F.G. Celii, H.R. Thorsheim, J.E. Butler, *J. Chem. Phys.*, 94, 5248, 1991.
- "Critical-Current Enhancement in Particle-irradiated Cuprate Superconductors", B.D. Weaver, M.E. Reeves, G.P. Summers, R. Soulen, *Applied Physics Letters*, 59 (20), 1991.
- "Deep Level Transient Spectroscopy of Irradiated p-Type in InP Grown by MOCVD", S.W.S. McKeever, R.J. Walters, S.R. Messenger, G.P. Summers, *Journal of Applied Physics*, 69(3), 1435, 1991.
- "Deep Level Transient Spectroscopy Study of Proton Irradiated p-type InP", R.J. Walters, G.P. Summers, *Journal of Applied Physics* 69 (9), 6488, 1991.
- "Dephasing and Relaxation in Coherently-excited Ensembles of Intermolecular Oscillators", D.P. McMorrow, W.T. Lotshaw, *Chemical Physics Letters*, 178, 69, 1991.
- "Discovery of Be-7 Accretion in Low Earth Orbit", G.W. Phillips, S.E. King, *NRL Review*, pp. 196-199, 1991.
- "Discovery of Be-7 Accretion in Low Earth Orbit", G.W. Phillips, S.E. King, R.A. August, J.C. Ritter, J.H. Cutchin, P.S. Haskins, J.E. McKisson, D.W. Ely, Weisenburger, R.B. Piercey, T. Dybler, *Advances in the Astronautical Sciences*, 74, pp. 575-583, 1991.
- "Discovery of Be-7 Accretion on the LDEF Spacecraft", G.W. Phillips, S.E. King, R.A. August, J.C. Ritter, J.H. Cutchin, P.S. Haskins, J.E. McKisson, D.W. Ely, Weisenburger, R.B. Piercey, T. Dybler, *Proceedings, EDA Space Environmental Analysis Workshop, ESTEC Publication ESA WPP-23, paper 5.19, 1-6, 1991.\**
- "DLTS Study of Proton Irradiated P-Type InP", R.J. Walters, G.P. Summers, *J. Applied Physics*, 69, 6488, 1991.
- "Gamma Radiation Survey of the LDEF Spacecraft Intermolecular Dynamics in Acetonitrile Probed with Femtosecond Fourier Transform Raman Spectroscopy", D.P. McMorrow, W.T. Lotshaw, *J. Phys. Chem.*, 95, 10395, 1991.

"Ionizing Space Radiation Effects on Surface Acoustic Wave Resonators", W.J. Stapor, J.H. Hines, D.H. Wilson, IEEE Trans. Nuc. Sci., NS-38, Vol. 6, pp. 1329-1335, 1991.

"Optically and Thermally Stimulated Luminescence in MgO", K.Chakrabarti, V.K. Mathur, G.P. Summers, Solid State Communications, 77, 481, 1991.

"Proton and Heavy Ion Upsets in GaAs MESFET Devices", T.Weatherford, L. Tran, W.J. Stapor, E.L. Petersen, J.B.Langworthy, D.P. McMorrow, W.Abdel-Kader, P.J. McNulty, IEEE Trans. Nuc. Sci., NS-38, Vol. 6, pp. 1450-1456, 1991.

"Quantitative Comparison of Single Event Upsets Induced by Protons and Neutrons", E. Normand, W.J. Stapor, P. McNulty, W.Abdel-Kader, M.H. Yaktieen, IEEE Trans. Nuc. Sci., NS-38, Vol. 6, pp. 1457-1462, 1991.

"Radiation Characterization of the ADSP2100A Digital Signal Processor", J.D. Kinnison, R.H. Maurer, B.G. Carkhuff, R.F. Conde, S.P. Buchner, K. Kang, W.J. Stapor, A.B. Campbell, G.A. Herlich, H.C. Moore, IEEE Trans. Nuc. Sci., NS-38, Vol. 6, pp. 1398-1402, 1991.

"Radiation Damage Assessment of Nb Tunnel Junction Devices", S.E. King, R. Magno, W.G. Maisch, IEEE Trans. Nucl. Sci., NS-38, 1991.

"Radiation Survey of the LDEF Spacecraft", S.E. King, G.W. Phillips, R.A. August, J.C. Ritter, J.C. Cutchin, P.S. Haskins, J.E. McKisson, D.W. Ely, Weisenberger, R.B. Piercey, T. Dybler, IEEE Trans. Nucl. Sci., 38, 525-530, 1991.

"Separation of Nuclear and Electronic Contributions to Femtosecond Four-wave Mixing Data", D.P. McMorrow, Optic Communications, 86, 236, 1991.

"SEU Flight Data From the CRRES MEP", A.B. Campbell, IEEE Trans. Nuc. Sci., NS-38, Vol. 6, pp. 1647-1654, 1991.

"Space Radiation Effects in InP Solar Cells", R.J. Walters, S.R. Messenger, G.P. Summers, R. Soulen, IEEE Trans. Nucl. Sci., NS-38, Vol. 6, pp. 1153-1158, 1991.

"Superconducting Tunnel Junctions for use as Energy Resolving X-Ray Detectors", D.VanVechten, C. Boyer, G.G. Fritz, S.E. King, M.P. Kowaski, M.N. Lovelette, M.G. Blamire, E. Kirk, R.E. Somekh, IEEE Transactions on Magnetics, 27, 2665-2668, 1991.

"Temperature Coefficients and Radiation Induced DLTS Spectra of MOCVD Grown n+p InP Solar Cells", R.J. Walters, G.P. Summers, Proceedings of the Space Photovoltaic Research and Technology, NASA Conference Publication 3121, 1991.\*

"Temperature Dependence of the Electrical Characteristics and Radiation Damage in MOCVD Grown n+p InP Solar Cells", R.J. Walters, R.L. Statler, G.P. Summers, Proceedings of the 3rd International Conference on InP and Related Materials, Cardiff, Wales, 1991.\*

"Effect of Cavity Sub-Corona Current on Polymer Insulation Life", A. Bruning, D. Kasture, F. Campbell, N. Turner, IEEE Transaction on Electrical Insulation, 28, 826, 1991.

"Electric Field Dependence of Observations in Finite Parabolic Quantum Wells", G. Herling, M. Rustgi, J. Appl. Phys., 69, 2328, 1991.

"Estimating Parameter End Points For Combined Environments", A. Namenson, IEEE Trans. Nuc. Sci., 38, 1578, 1991.



"Metal Insulator Transition in BMBO (M =K,Rb)", S. Guha, D. Peebles, T. Wieting, R. Gilardi, Physical C, 185-189, 1991.

"Potential Harmonic Expansion for Atomic Wave Functions", M. I. Haftel, M. Fabre de la Ripelle, S. Y. Larsen, Phys. Rev. A, 44, 7084, 1991.

"Precise Nonvariational Calculation of Excited States of Helium with the Correlation Function Hyperspherical Harmonic Method", M. I. Haftel, R. Krivec, V. B. Mandelzweig, Phys. Rev. A, 44, 7158, 1991.

"Vapor Deposited thin Films and Their Densification During Ion Beam Assisted Deposition", T.D. Andreadis, M. Rosen, M.I. Haftel, J.A. Sprague, Mat. Res. Soc. Symp. Proc., 202, 283-288, 1991.\*

"Zone Center Optical Phonons in CuO Studied by Raman and Infrared Spectroscopy", S. Guha, D. Peebles, T. Wieting, Phys. Rev. B, 43, 13092, 1991.

"A Precipitate Coarsening Mechanism for Buried Layer Formation by Ion Implantation", D.W. Brown, Z.A. Munir, R.G. Musket, Nucl. Inst. Meth. Phys. Res., B59/60, 627-631, 1991.

"Aluminum Cluster Reactions", R.E. Leuchtner, A.C. Harms, A.W. Castelman, Jr., J. Chem. Phys., 94, 1093, 1991.

"Below-Bandgap Refractive Index of AlAs/GaAs Multiple Quantum Wells", G.K. Hubler, C.N. Waddell, E.P. Donovan, J.M. Zavada, Opt. and Quan. Elects., 23, S883-S893, 1991.

"Charge Collection in GaAs MESFETs and MODFETs", P. Buchner, K. Kang, D.W. Tu, A.R. Knudson, A.B. Campbell, D.P. McMorrow, V. Srinivas, Y.J. Chen, IEEE Trans. Nucl. Sci., NS-38, pp. 1370-1376, 1991.

"Classical Two-Dimensional Magnetoresistance in the Normal State of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>", M.S. Osofsky, H. Rakoto, J.C. Ousset, J.P. Ulmet, J. Leotin, S. Askenazy, D.B. Chrisey, J.S. Horwitz, E.F. Skelton, S.A. Wolf, Physica C, 182, 257-260, 1991.

"Comparative Study of Microwave Surface Impedance of High Tc Superconductor Samples", O. Llopis, T. Parra, J.C. Ousset, D.B. Chrisey, J.S. Horwitz, J. Graffeuil, Solid State Communications, 78, 631-633, 1991.

"Comparison of Experimental Charge Collection Waveforms with Pisces Calculations", A.R. Knudson, A.B. Campbell, IEEE Trans. Nuc. Sci., NS-38, Vol. 6, pp. 1540-1545, 1991.

"Critical Current Enhancement in Proton-Irradiated Tl<sub>2</sub>CaBa<sub>2</sub>Cu<sub>2</sub>O<sub>8</sub> Films", B.D. Weaver, M.E. Reeves, D.B. Chrisey, G.P. Summers, W.L. Olson, M.M. Eddy, T.W. James, E.J. Smith, J. Appl. Phys., 69, 1119-1121, 1991.

"Detection of Light using High Temperature Superconducting Microstriplines", J.C. Culbertson, H.S. Newman, U. Strom, J.M. Pond, D.B. Chrisey, J.S. Horwitz, S.A. Wolf, IEEE Trans. on Magnetics, 27, 1536-1539, 1991.

"Diamond Thin Film Growth on Silicon at Temperatures Between 500 and 600C Using an Electron Cyclotron Resonance Microwave Plasma", C.R. Eddy, Jr., B.D. Sartwell, D.L. Youchison, Surf. & Coat. Technol., 48, 69-79, 1991.

- "Effect of Coatings on Rolling Contact Fatigue Behaviour of M50 Bearing Steel", R.M. Middleton, P.J. Huang, M.G.H. Wells, R.A. Kant, *Surface Engineering*, 7, 319–326, 1991.
- "Fabrication of Low-Z X-Ray Mirrors by Ion Beam Assisted Deposition", G.K. Hubler, C.A. Carosella, P.G. Burkhalter, R.K. Feitag, C.M. Cotell, W.D. Coleman, *Nucl. Inst. Meth. Phys. Res.*, B59/60, 268–271, 1991.
- "Gas Phase Reactivity of Thermal Metal Clusters", A.W. Castleman, Jr., A.C. Harms, R.E. Leuchtner, *Z. Phys.*, D 19, 343, 1991.
- "In Situ Deposition of Epitaxial  $PbZr_xTi(1-x)O_3$  Thin Films by Pulsed Laser Deposition", J.S. Horwitz, K.S. Grabowski, D.B. Chrisey, R.E. Leuchtner, *Appl. Phys. Lett.*, 59, 1565–1567, 1991.
- "In Situ Pulsed Laser Deposition of  $Nd_{1.85}Ce_{0.15}CuO_{4-y}$ ", J.S. Horwitz, D.B. Chrisey, M.S. Osofsky, K.S. Grabowski, T.A. Vanderah, *J. Appl. Phys.*, 70, 1045–1047, 1991.
- "Ion Beam Processing of Metal Surfaces for Improved Corrosion Resistance", E. McCafferty, P.M. Natishan, G.K. Hubler, *Nucl. Instrum. & Meth. in Phys. Res.*, B56/57, 639–643, 1991.
- "Light Detection Using High-Tc Microstrip Lines as a Probe of Film Homogeneity", J.C. Culbertson, H.S. Newman, U. Strom, J.M. Pond, D.B. Chrisey, J.S. Horwitz, S.A. Wolf, *J. Appl. Phys.*, 70, 4995–4999, 1991.
- "Magnetically Modulated Microwave Absorption Measurement of the Penetration Depth in a Polycrystalline  $YBa_2Cu_3O_{7-x}$  Thin Film", R. Karim, C. Vittoria, A. Widom, D.B. Chrisey, J.S. Horwitz, *J. Appl. Phys.*, 69, 4891–4893, 1991.
- "Microwave Devices Using  $YBa_2Cu_3O_{7-?}$  Films Made by Pulsed Laser Deposition", H.S. Newman, D.B. Chrisey, J.S. Horwitz, B.D. Weaver, M.E. Reeves, *IEEE Trans on Magnetics*, 27, 2, 2540–2543, 1991.
- "Molecular-Dynamics Simulation of the Energetic Deposition of Ag Thin Films", C.M. Gilmore, J.A. Sprague, *Phys. Rev. B*, 44, 8950–8957, 1991.
- "Novel Filter Design Incorporating Asymmetrical Stripline Y-Junction Circulators", H. How, C. Vittoria, C. Carosella, *IEEE Trans. Microwave Theory & Techniques*, 39, 40–41, 1991.
- "Observation of Ultrahigh Critical Current Densities in High-Tc Superconducting Bridge Constrictions", H. Jiang, Y. Huang, H. How, S. Zhang, C. Vittori, A. Widom, D.B. Chrisey, J.S. Horwitz, R. Lee, *Phys. Rev. Lett.*, 66, 1785–1788, 1991.
- "Particle-Induced Modification of Thin Film  $YBa_2Cu_3O_{7-?}$  Transport Properties and Microwave Device Performance", D.B. Chrisey, J.S. Horwitz, H.S. Newman, B.D. Weaver, K.S. Grabowski, V.C. Cestone, M.E. Reeves, J.M. Pond, G.P. Summers, *IEEE Trans. on Magnetics*, 27, 884–887, 1991.
- "Penetration Depth and Microwave Loss Measurements with a  $YBa_2Cu_3O_{7-?}/LaAlO_3/YBa_2Cu_3O_{7-?}$  Trilayer Transmission Line", J.M. Pond, K.R. Carroll, J.S. Horwitz, D.B. Chrisey, M.S. Osofsky, V.C. Cestone, *Appl. Phys. Lett.*, 59, 3033–3035, 1991.
- "Preparation by Ion-Beam-Assisted Deposition. Analysis and Tribological Behavior of  $MoS_2$  Films", R.N. Bolster, I.L. Singer, J.C. Wegand, S. Fayeulle, C.R. Gossett, *Surf. & Coat. Technol.*, 46, 207–216, 1991.

"Proton Radiation Effects in Microwave Cavities and Ring Resonators Fabricated from YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>-?", B.D. Weaver, J.M. Pond, D.B. Chrisey, J.S. Horwitz, H.S. Newman, G.P. Summers, Appl. Phys. Lett., 58, 1563-1565, 1991.

"Proton-Induced Reduction of Rs, Jc, and Tc in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>-? Thin Films", D.B. Chrisey, J.S. Horwitz, H.S. Newman, M.E. Reeves, B.D. Weaver, K.S. Grabowski, G.P. Summers, J. of Superconductivity, 4, 57-60, 1991.

"Pulsed Laser Deposition of Oriented PbZr<sub>0.54</sub>Ti<sub>0.46</sub>O<sub>3</sub>", K.S. Grabowski, J.S. Horwitz, D.B. Chrisey, J. of Ferroelectrics, 116, 19-33, 1991.

"Radiation Effects in High Temperature Superconducting Films and Devices for the NRL High Temperature Superconductivity Space Experiment", B.D. Weaver, E.M. Jackson, G.P. Summers, D.B. Chrisey, J.S. Horwitz, J.M. Pond, H.S. Newman, E.A. Burke, IEEE Trans. Nucl. Sci., NS-38, Vol 6, 1284-1288, 1991.

"Redistribution of Beryllium in InP and Ga<sub>0.47</sub>In<sub>0.53</sub>As Grown by Hydride Source Molecular Beam Epitaxy and Metalorganic Molecular Beam Epitaxy", M.B. Panish, R.A. Hamm, D. Ritter, H.S. Luftman, C.M. Cotell, J. Cryst. Growth, 112, 343, 1991.

"Structural Relaxation in Ion-Damaged Amorphous Germanium", C.E. Bouldin, R.A. Forman, M.I. Bell, E.P. Donovan, Phys. Rev. B, 44, 5492-5496, 1991.

"Studies of Group III Cation Reactions: Consecutive Association of Methanol to Al<sup>+</sup>, Ga<sup>+</sup> and In<sup>+</sup>", R.E. Leuchtner, H. Funasaka, R.W. Farley, A.C. Harms, A.W. Castleman, Jr., Int. J. Mass. Spec. and Ion Proc., 102, 199, 1991.

"The Corrosion Behavior of Mo-Al, Cr-Al and Cr-Mo-Al Surface Alloys Produced by Ion Beam Mixing and Ion Implantation", P.M. Natishan, E. McCafferty, G.K. Hubler, Corr. Sci., 32, 721-731, 1991.

"The Pitting Corrosion Behavior of Aluminum Ion Implanted with Tantalum", P.M. Natishan, E. McCafferty, G.K. Hubler, Nucl. Inst. Meth. Phys. Res., B59/60, 841-844, 1991.

"The Tribological Behavior of TiN Coatings Prepared by IBAD", S.A. Dillich, R.A. Kant, B.D. Sartwell, J.A. Sprague, F.A. Smidt, J. of Tribology, 113, 214-219, 1991.

"X-Ray Diffraction Analysis of Concentration and Residual Stress Gradients in Nitrogen-Implanted Niobium and Molybdenum", S.I. Rao, C.R. Houska, K.S. Grabowski, G. Ice, C.J. Sparks, J. Appl. Phys., 69, 8111-8118, 1991.

"2D Conductivity in the Normal State of the 123 Superconducting Copper Oxides", J.C. Ousset, S. Askenazy, H. Rakoto, J.M. Bronto, J.F. Bobo, M.S. Osofsky, D. Chrisey, J. Horowitz, E.F. Skelton, S.A. Wolf, Proc. Intl. Conf. on Magnetism, 1991.

"Brillouin Scattering from Ion-Beam Sputtered Cu/Ni Superlattices", S. Kumar, R.R. Bhadra, A. Fartash, M. Grimsditch, C. Kim, S.B. Qadri, A.S. Edelstein, Phys. Rev. B, 44 5905, 1991.

"Carbon K Edge Spectroscopy of Internal Interface & Defect States of CVD Diamond Films", J.C. Nithianandam, J.C. Rife, H. Windischmann, Appl. Phys. Lett., 60 135-137, 1991.

"Characterization of Si on Insulator Substrates Using Reflection Mode Double Crystal Topography", D.I. Ma, G.J. Campisi, S.B. Qadri, M.C. Peckerar, Thin Solid Films, 1991.

"Characterization of the Electrical Bias Induced Stress Variation on Metal-Oxide-Semiconductor Field Effect Transistors by Double Crystal X-Ray Topography", D.I. Ma, S.B. Qadri, M.C. Peckerar, D. McCarthy, Thin Solid Films, 1991.

"Comparison of Measured & Calculated values for the Diffraction Line Profiles & Integral Reflection Coefficients for Multiple Diffraction Orders of Multilayer Structures", P.G. Burkhalter, J.V. Gilfrich, R.K. Freitag, H.B. Rosenstock, D.B. Brown, Proc. of SPIE Intl. Symp., 1991.

"Correcting for X-Ray Energy Calibration Error Caused by Misalignment of a Right-Angle Linkage Monochromator", K.H. Kim, M.I. Bell, C.M. Dozier, R.K. Freitag, C.E. Bouldin, Rev. Sci. Instrum., 62 (4) 982, 1991.

"Correlation of Magnetic Properties & Local Atomic Structure Observed by Electron-Yield EXAFS in Amorphous Co<sub>74</sub>Fe<sub>6</sub>B<sub>15</sub>Si<sub>5</sub> Thin Films", V.G. Harris, S.A. Oliver, W.B. Nowak, K.H. Kim, W.T. Elam, J. Appl. Phys., 69 (8) 5457, 1991.

"Direct Observation of Disorder and Corrections in Perovskite-Structure Ferroelectrics", K.H. Kim, W.T. Elam, Ferroelectrics, Vol. 120,103-105, 1991.

"Electron-Beam Deposition of Zirconia Films Stabilized in High Temperature Phases by Different Oxides", S.B. Qadri, E.F. Skelton, C. Kim, M.Z. Harford, P. Lubitz, Proc. of the Int'l. Conf. on Metall. Coatings & Thin Films & Solid Films, 1991.

"Electron-Beam Deposition of Zirconia Films Stabilized in High Temperature Phases with Different Oxides", S.B. Qadri, E.F. Skelton, M.Z. Harford, P. Lubitz, Thin Solid Films, 1991.

"Extended X-Ray Absorption Fine Structure Studies of IBS Fe-Tb Alloy Films", V.G. Harris, K.D. Aylesworth, K.H. Kim, W.T. Elam, N.C. Koon, J. Appl. Phys., 70 (10) 6311, 1991.

"E-Beam Deposition of In<sub>2</sub>O<sub>3</sub> Stabilized ZrO<sub>2</sub> Films", S.B. Qadri, E.F. Skelton, M.Z. Harford, R. Jones, P. Lubitz, J. Vac. Sci. Technol., A9 (3) 510, 1991.

"FMR and EXAFS Studies of Heat Treated Fe-RICH and Co-RICH TM-M Thin Films", V.G. Harris, C. Vittoria, W.T. Elam, IEEE T. on Magn. Commemorative Issue, Vol. 27, No. 4, 3620, 1991.

"Fundamental Experiments & New Horizons in Ferroelectricity", J. Toulouse, M.I. Bell, K.A. Nelson, N. Dalal, W.A. Smith, Ferroelectrics, Vol. 120 pp. 1-5, 1991.

"High Intensity Generation of 9-13 A X-Rays from BaF<sub>2</sub> Targets", A. Zigler, P.G. Burkhalter, D.J. Nagel, K. Boyer, T.S. Luk, A. McPherson, J.C. Solem, C.K. Rhodes, Appl. Phys. Lett., 59 (7) 777-778, 1991.

"Impact Damage to MTV Targets (U)", A.E. Williams, Proc. of the LTH-5 Semi-Annual Rev., 1991.

"Ion Beam Deposition of Ag/Fe Multilayers and Their Structural and Magnetic Properties", S.B. Qadri, C. Kim, M. Twigg, P. Lubitz, M. Rubinstein, J. Vac. Sci. Technol., A9 (3) 512, 1991.

"Langmuir-Blodgett Multilayer Films for a Ferroelectric Liquid Crystalline Copolymer Using an Alternate Deposition Method", A.F. Thibodeaux, R. Geer, S.B. Qadri, J. Adams, J. Naciri, R. Shashidhar, R.S. Duran, Polymer, 1991.

"Liquid Crystalline Phases of a Diacetylenic Phosphocholine Lipid", M. Nagumo, B.R. Ratna, S.B. Qadri, J. Naciri, R. Shashidhar, Mol. Liq. Cryst., Vol. 206 p. 123, 1991.

"Magnetic Properties & Local Ordering During Thermal Annealing of Amorphous Fe<sub>75</sub>Ni<sub>5</sub>B<sub>15</sub>Si<sub>5</sub> Films", S.A. Oliver, V.G. Harris, C. Vittoria, W.T. Elam, K.H. Kim, H.H. Hamdeh, M. Alhabash, J. Appl. Phys., 70, 5842, 1991.

"Magnetic Properties of Permalloy-Coated Organic Tubules", J.J. Krebs, M. Rubinstein, P. Lubitz, M.Z. Harford, S. Baral, R. Shashidhar, Y.S. Ho, G.M. Chow, S.B. Qadri, J. Appl. Phys., 70, 6404, 1991.

"Magnetic Properties of Permalloy-Coated Organic Tubules", J.J. Krebs, M. Rubinstein, P. Lubitz, M.Z. Harford, S. Baral, R. Shashidhar, Y.S. Ho, G.M. Chow, S.B. Qadri, Proc. of 5th MMM Meeting, 1991.\*

"Measurement of Energy Penetration Depth of Subpicosecond Laser Energy Into Solid Density Matter", A. Zigler, P.G. Burkhalter, D.J. Nagel, M.D. Rosen, K. Boyer, G. Gibson, T.S. Luk, T.S. Luk, A. McPherson, C.K. Rhodes, Appl. Phys. Lett., 59(5) 534-536, 1991.

"Molecular Beam Epitaxy of a Low Strain II-VI Heterostructure: ZnTe/CdSe", H. Luo, . Samarth, F.C. Zhang, A. Pareek, M. Dobrowolska, J.K. Furdyna, K. Mahalingham, N. Otsuka, W.C. Chou, A. Petrou, S.B. Qadri, Appl. Phys. Lett., 58 (16) 1783, 1991.\*

"Nondestructive Characterization of the Structure and Mechanical Properties of Metallic Superlattice Thin Films", E. Schlesinger, R.C. Cammarata, C. Kim, S.B. Qadri, A.S. Edelstein, Proc. of Nondestructive Characterization of Materials IV, 1991.\*

"Optical Materials - UV", J.C. Rife, Electro-Optics Handbook, Chapter 9, 1991.

"Periodicities Associated with Low-Order GaAs/AlAs Superlattices", J. Pellegrino, S.B. Qadri, W. Tseng, J. Comas, Proc. of the Int'l. Conf. on Metall. Coatings & Thin Films & Solid Films, 1991.\*

"Periodicities Associated with Low-Order GaAs/AlAs Superlattices", J. Pellegrino, S.B. Qadri, W. Tseng, R. Miller, J. Comas, Thin Solid Films, 1991.

"Periodicities in the X-Ray Diffraction Low-Order AlAs/GaAs Superlattices", J. Pellegrino, S.B. Qadri, W. Tseng, W.R. Miller, J. Comas, Proc. of the Mat. Res. Soc. Symp., 1991.\*

"Photoemission Study of Low-Fluence, Non-Thermal Laser Damage of UHV-Cleaved Gallium Arsenide (110)", S.S. Goldenberg, J.P. Long, M.N. Kabler, Mat. Res. Soc. Symp., Vol. 201 pp. 519-524, 1991.

"Plasma Production from Ultraviolet Transmitting Targets Using Subpicosecond Ultraviolet Radiation", A. Zigler, P.G. Burkhalter, D.J. Nagel, M.D. Rosen, K. Boyer, T.S. Luk, A. McPherson, C.K. Rhodes, Opt. Lett., 16(16) 1261-1263, 1991.

"Plasticity in Shocked Single Crystals Viewed by Pulsed X-Ray Diffraction", R.R. Whitlock, J.A. Wark, Proc. of the Topical Conf. on Shock Compression of Cond. Matter, 1991.

"Pressure Dependence of T<sub>c</sub> in Tl<sub>2</sub>Ba<sub>2</sub>CaCu<sub>2</sub>O<sub>8</sub> at Hydrostatic Pressure to 6 GPa", N. Moulton, .A. Wolf, E.F. Skelton, D.H. Liebenberg, T.A. Vanderah, A.M. Hermann, Phys. Rev. B, 44 12 632, 1991.

"Pressure Induced Phase Transition of  $n0.83Fe0.17Se$ . S.B. Qadri, E.F. Skelton, A.W. Webb, N.E. Moulton, J.Z. Hu, J.K. Furdyna", Phys. Rev. B, 1991.

"Processing of  $YBa_2Cu_3O_x$  Ceramic Materials: Effect of Additives", A.S. Rao, L.S. O'Connor, S.B. Qadri, Proc. of the Trans. Metallurgical Soc., 1991.

"Process-Dependent Densities of Traps & Potential Traps in Thermal  $SiO_2$ ", H. Wei, T. Hochwitz, A.K. Henning, J. Slinkman, J.C. Rife, W.R. Hunter, Trans. of IEEE Elec. Dev. Mtg., 1991.

"Recent Studies of Collisionally Excited X-Ray Laser At NRL", E.A. McLean, J.A. Stamper, C.A. Brown, C.K. Manka, H.R. Griem, J.C. Rife, B.H. Ripin, Proc. of the 2nd Intl. Colloq. on X-Ray Lasers, 1991.

"Selective Photodevices for the VUV", W.R. Hunter, J.F. Seely, Appl. Opt., 1991.

"Selective Photodevices for the VUV", W.R. Hunter, J.F. Seely, Proc. of SPIE Conf. on Multilayer & Grazing Incidence X-Ray/EUV Optics, 1991.

"Soft X-Ray Continuum from Laser-Irradiated High-Z Targets", G. Mehlman, P.G. Burkhalter, D.A. Newman, B.H. Ripin, J. Quant. Spectrosc. Radiat. Trans., 45 (4) 225-234, 1991.

"Soft X-Ray Emission from Excimer Laser-Matter-Interaction", P.G. Burkhalter, D.A. Newman, H. Shields, M. Powers, Proc. of LASERS'91 Conf., 1991.

"Structural and Magnetic Properties of Ion-Beam Deposited Cu/Fe Multilayers", S.B. Qadri, C. Kim, K.H. Kim, P. Lubitz, M. Twigg, J. Vac. Sci. Technol., A9 (3) 430, 1991.

"Structural and Magnetic Properties of Ion-Beam Sputtered Al/Fe Multilayers", S.B. Qadri, C. Kim, M. Twigg, M.Z. Harford, P. Lubitz, Thin Solid Films, 1991.

"Structural and Magnetic Properties of Ion-Beam Sputtered Deposited Al/Fe Multilayers", B. Qadri, C. Kim, M. Twigg, M.Z. Harford, P. Lubitz, Proc. of the Int'l. Conf. on Metall. Coatings & Thin Films & Solid Films, 1991.

"Structural, Elastic and Transport Properties of Ag/Al Multilayer Thin Films Prepared by Ion-Beam Sputtering", C. Kim, S.B. Qadri, T.M. Tritt, A.C. Ehrlich, S.M. Hues, R.L. Jacobsen, K.H. Kim, W.T. Elam, E.F. Skelton, J.P. Kirkland, R.A. Neiser, Proc. Int'l. Conf. on Metall. Coatings, 1991.

"Structural, Elastic and Transport Properties of Ag/Al Multilayer Thin Films Prepared by Ion-Beam Sputtering", C. Kim, S.B. Qadr, T.M. Tritt, A.C. Ehrlich, S.M. Hues, Thin Solid Films, 1991.

"Surface Characterization of Multilayer X-ray Diffraction Specimens", P.G. Burkhalter, D.B. Brown, J.V. Gilfrich, J.H. Konnert, P. D'Antonio, H.B. Rosenstock, L.M. Shirey, M. Thompson, V. Elings, J. Vac. Sci. Technol., B9 (2), 1991.

"Synchrotron X-Ray Diffraction from a Sub-Femtoliter Volume", E.F. Skelton, J.D. Ayers, S.B. Qadri, N.E. Moulton, K.P. Cooper, L.W. Finger, H.K. Mao, Z. Hu, Science, Vol. 253 1123, 1991.

"Temperature Dependent Electrical Resistivity & Magnet Resistance of Fe-Ni Multilayers", A.C. Ehrlich, T.M. Tritt, D.J. Gillespie, C. Kim, A.S. Edelstein, S.B. Qadri,

"Temperature Dependent Electrical Resistivity & Magnet Resistance of Fe-Ni Multilayers", A.C. Ehrlich, T.M. Tritt, D.J. Gillespie, C. Kim, A.S. Edelstein, S.B. Qadri, Proc. of 5th MMM Meeting, 1991.

"The Valence of Copper in  $\text{LaCuO}_3$ : An X-Ray Absorption Study", A.W. Webb, K.H. Kim, C. Bouldin, Solid State Commun., 1991.

"Thin Film Interference Optics for Imaging the O II 834-A Airglow", J.F. Seely, W.R. Hunter, Appl. Opt., 30 2788-2794, 1991.

"Thin Film Interference Optics for Imaging the O II 834-A Airglow", J.F. Seely, W.R. Hunter, Proc. of SPIE Conference on Multilayer & Grazing Incidence X-Ray/EUV Optics, Vol. 1546, 1991.

"Time Dependence of Radiation-Induced Interface Trap Formation in MOS Devices as a Function of Oxide Thickness and Applied Field", D.B. Brown, N.S. Saks, J. of Appl. Phys., 70 (7), 3734, 1991.

"X-Ray Characterization of (Zn,Cd)Te/CdTe Strained Layer Superlattices", S.B. Qadri, J. Vac. Sci. Technol., A9 (3) 954, 1991.

"X-Ray Fluorescence Analysis of Tree Rings", V. Gilfrich, N.L. Gilfrich, E.F. Skelton, J.P. Kirkland, S.B. Qadri, D.J. Nagel X-Ray Spectro., Vol. 20 pp. 203-208, 1991.

"A New Theoretical Model for the Diamond 1s Core Exciton", K.A. Jackson, M.R. Pederson, Phys. Rev. Lett., 67, 2521, 1991.

"Adequacy of the Local Spin Density Approximation for Gd", D.J. Singh, Phys. Rev. B, 44, 7451, 1991.

"All-Electron and Pseudopotential Force Calculations Using the Linear Augmented Plane Wave Method", R. Yu, D. Singh, H. Krakauer, Phys. Rev. B, 43, 6411, 1991.

"All-Electron First Principles Supercell Total Energy Calculation of the Vacancy Formation Energy in Aluminum", M.J. Mehl, B.M. Klein" Physica, B172, 211-215, 1991.

"Application of First-Principles Methods in Exploring for New Materials", L.L. Boyer, Ferroelectrics, 120, 7, 1991.

"Axial Channeling in Perfect Crystals, the Continuum Model and the Method of Averaging", H.S. Dumas, J.A. Ellison, A.W. Sáenz, Ann. Phys., 209, No. 1, 97, 1991.

"Cagey Carbon Conundrums", W.E. Pickett, Nature, Vol. 351, No. 6328, 602, 1991.

"Calculation of Energy Barriers For Physically Allowed Lattice-Invariant Strains in Aluminum and Iridium", M.J. Mehl, L.L. Boyer, Phys. Rev. B, 43, 9498, 1991.

"Calculation of the Electron Momentum Density and Compton Scattering Measurements for Nickel", D.L. Anastassopoulos, G.D. Priftis, N.I. Papanicolaou, N.C. Bacalis, D.A. Papaconstantopoulos, J. Phys.: Condens. Matter, 3, 1099, 1991.

"Calculation of the Superconducting Parameter  $\langle I_2 \rangle$  for HCP Transition Metals", C.-G. Jiang, G. Fletcher, J.L. Fry, D.A. Papaconstantopoulos, Phys. Rev. B, 44, 2268, 1991.

"Calculations of the Electronic Structure and Superconducting Properties of  $\text{BaPb}_{1-x}\text{Sb}_x\text{O}_3$ ", J.P. Julien, F. Cyrot-Lackmann, A. Pasturel, D.A. Papaconstantopoulos, Phys. Rev. B, 43, 2903, 1991.

"Calculations of the Total Energy, Electron-Phonon Interaction and Stoner Parameter in the 5d Transition Metal Hydrides", D.A. Papaconstantopoulos, J.P. Skroch, G.D. Drew, J. of the Less-Common Metals, 172-174, 401, 1991.

"Can Clusters be Superheated?", J. Broughton, Phys. Rev. Lett., 67, 2990, 1991.

"CaNiN: Suppression of Electronic Instability by Interchain Coupling", S. Massidda, W.E. Pickett, M. Posternak, Phys. Rev. B, 44, 1258, 1991.

"Diamond-Nickel Interfaces: Calculations of the Electronic and Atomic Structure and Schottky Barriers", S.C. Erwin, W.E. Pickett, S. Massidda, W.E. Pickett, M. Posternak, Surf. & Coatings Technol., 47, 487, 1991.

"Effects of Electric Microfields on Argon Dielectronic Satellite Spectra in Laser-Produced Plasmas", L.A. Woltz, V.L. Jacobs, C.F. Hooper, Jr., R.C. Mancini, Phys. Rev. A, 44, 1281, 1991.

"Elastic Properties of Amorphous Si and Derived Debye Temperatures and Gruneisen Parameters: Model Calculation", J.L. Feldman, J.Q. Broughton, F. Wooten, Phys. Rev. B, 43, 2152, 1991.

"Electronic Structure and Electron-Phonon Coupling in Layered Copper Oxide Superconductors", W.E. Pickett, R.E. Cohen, H. Krakauer, Physica, B169, 45, 1991.

"Electronic Structure of  $\text{Ba}(\text{Sn,Sb})\text{O}_3$ : Absence of Superconductivity", D.J. Singh, D.A. Papaconstantopoulos, J.P. Julien, F. Cyrot-Lackmann, Phys. Rev. B, 44, 9519, 1991.

"Electronic Structure of Crystalline  $\text{K}_6\text{C}_{60}$ ", S. Erwin, M.R. Pederson, Phys. Rev. Lett., 67, 1610, 1991.

"Electronic Structure of Doped  $\text{Sr}_2\text{VO}_4$ ", J. Singh, D.A. Papaconstantopoulos, H. Krakauer, B.M. Klein, W.E. Pickett, Physica, C175, 329, 1991.

"Entropy Calculation Beyond the Harmonic Approximation: Application to Self-Diffusion on Si", K.C. Pandey, E. Kaxiras, Phys. Rev. Lett., 66, 915, 1991.

"First Principles Calculation of the Elastic Moduli of  $\text{Ni}_3\text{Al}$ ", J.E. Osburn, M.J. Mehl, B.M. Klein, Phys. Rev. B, 43, 1805, 1991.

"First Principles Calculations for Polarized Crystals", L.L. Boyer, R.E. Cohen, P.J. Edwardson, H. Krakauer, Ferroelectrics, 117, 233, 1991.

"First-Principles Calculations of Defect-Induced Lattice Relaxation in Ionic Systems", K.A. Jackson, M.R. Pederson, B.M. Klein, Phys. Rev. B, 43, 2364, 1991.

"Gradient Corrected Density Functional Studies of  $\text{CaCuO}_2$ ", D.J. Singh, W.E. Pickett, Phys. Rev. B, 44, 7715, 1991.



"Gradient Corrected Density Functionals: Full-Potential Calculations for Iron", D.J. Singh, W.E. Pickett, H. Krakauer, Phys. Rev. B, 43, 11628, 1991.

"Ground-State Properties of Lanthanum: Treatment of Extended-Core States", D.J. Singh, Phys. Rev. B, 43, 6388, 1991.

"Higher Order Averaging for Nonperiodic Systems", A.W. Sáenz, J. Math. Phys., 32, 2679, 1991.

"H-Point Phonon in Molybdenum: Super-Linearized APW Calculations", D.J. Singh, H. Krakauer, Phys. Rev. B, 43, 1441, 1991.

"Influence of the Local Spin-Density Correlation Functional on the Stability of bcc-Ferromagnetic Iron", D.J. Singh, D.P. Cougherty, J.M. MacLaren, R.C. Albert, C.S. Wang, Phys. Rev. B, 44, 7701, 1991.

"Lattice Instabilities, Isotope Effect, and High Tc Superconductivity in La<sub>2-x</sub>Ba<sub>x</sub>CuO<sub>4</sub>", W.E. Pickett, R.E. Cohen, Phys. Rev. Lett., 67, 228, 1991.

"Linear Polarization of Radiation from Planar Channeled Electrons and Positrons", R. Fusina, Phys. Rev., B43, 11367, 1991.

"Local Density-Approximation-Based Simulations of Hydrocarbon Interactions with Applications to Diamond Chemical Vapor Deposition", M.R. Pederson, K.A. Jackson, W.E. Pickett, Phys. Rev. B, 44, 3891, 1991.

"Localized Adatom Vibrations in Si Clusters", J.L. Feldman, E. Kaxiras, X.-P. Li, Phys. Rev. B, 44, 8334, 1991.

"Magnetism in Transition Metal Hydrides", D.A. Papaconstantopoulos, Europhys. Lett., 15 (6), 621, 1991.

"New Low Energy Crystal Structure for Silicon", L.L. Boyer, J.L. Feldman, J.Q. Broughton, M.J. Mehl, Phys. Rev. Lett., 67, 715, 1991.

"Onset of Metallization and Related Transitions in Solid Hydrogen", E. Kaxiras, J. Broughton, R.J. Hemley, Phys Rev Lett., 67, 1138, 1991.

"Pseudoenergies for Simulations on Metallic Systems." M.R. Pederson, K.A. Jackson, Phys. Rev. B, 43, 7312, 1991.

"Quasiparticle Properties of the 2D Hubbard Model in a Propagator Renormalized Fluctuation Exchange Approximation." J.W. Serene, D.W. Hess, Phys Rev B, 44, 3391, 1991.

"Relaxation of Icosahedral-cage Silicon Clusters via Tight Binding Molecular Dynamics", F.S. Khan, J.Q. Broughton, Phys. Rev. B, 43, 11754, 1991.

"Reply to Comment." by Swift et al., E. Kaxiras, Phys. Rev. Lett., 66, 2687, 1991.

"Review of The Superfluid Phases of Helium 3, by Dieter Vollhardt and Peter Wolfle", J.W. Serene, Science, 251, 97, 1991.

"Self Consistent Numerical Calculations for Nested Fermi Liquids", D.W. Hess, J.W. Serene, J. Phys. Chem. Solids, Vol. 52, 11/12, 1385, 1991.

"Semiconductor Surface Restoration by Valence Mending Adsorbates: Application to Si(100):VI", E. Kaxiras, Phys. Rev. B, 43, 6824, 1991.

"Surface Strain of Tungsten (001)", J. Chen, H. Krakauer, D.J. Singh, Phys. Rev. B, 43, 2398, 1991.

"Temperature Dependent Resistivity from Phonons in Cuprate Superconductors", W.E. Pickett, J. Superconductivity, 4, 397, 1991.

"Theoretical Fermi Surface Properties and Super-conducting Parameters for K3C60", S.C. Erwin, W.E. Pickett, Science, 254, 842, 1991.

"Theory of Magnetic and Structural Ordering in Iron Clusters", J.L. Chen, C.S. Wang, K.A. Jackson, M.R. Pederson, Phys. Rev. B, 44, 6558, 1991.

"Variational Monte Carlo Evaluations of Gutzwiller States for the Large U Anderson Lattice Model", P. McQueen, C.S. Wang, Phys. Rev. B, 44, 10021, 1991.

"On the Comparison Between Josephson-Junction Array Variations", K.Y. Tsang, K. Wiesenfeld, Journal of Applied Physics, 70, 1075, 1991.

"Role of the Implosion Kinetic Energy in Determining the Kilovolt X-ray Emission From Aluminum Wire Array Implosions", C. Deeney, T. Nash, R. R. Prasad, L. Warren, K. G. Whitney, J. W. Thornhill, M. C. Coulter, Physical Review A, 44, 10, 1991.

"Leakage Currents Outside an Imploding Z Pinch", R. E. Terry, N. R. Pereira, Physics of Fluids B, 3, 195, 1991.

"Achievable Pump Power and Gain in the Al<sub>K</sub> - Mg<sub>K</sub> Photoresonant X-ray Laser", J. P. Apruzese, M. Buie, Journal of Applied Physics, 70, 1957, 1991.

"K-shell X-ray Emission From Sodium Wire Array Implosions as the Pump for the Sodium-Neon X-ray Laser Scheme", C. Deeney, T. Nash, R. R. Prasad, L. Warren, J. P. Apruzese, Applied Physics Letters, 58, 1021, 1991.

"Overlapped Stark Profiles of Coincident X-ray Lines as Possible Diagnostics of Core-shell Mixing in Spherical Plasma Implosions", J. P. Apruzese, P. C. Kepple, Physical Review A, 43, 6964, 1991.

"Review on Spontaneous Magnetic Field in Laser-Produced Plasmas Phenomena and Measurements", J.A. Stamper, Laser and Particle Beams, 9 (3), 841, 1991.

"Measurement of Plasma Opacity from Laser-Produced Optically Thin Strongly Coupled Plasmas", A.N. Mostovych, K.J., Kearney, J.A., Stamper, A. J., Schmitt, Physical Review Letters, 66, 612, 1991.

"A Passive Method to Trap an Electron Beam in a Stelleron Accelerator", A.V. Deniz, Journal of Applied Physics, 69, 3, 1151, 1991.

"Three-Dimensional Filamentation of Light in Laser Plasmas", A.J. Schmitt, Physics of Fluids B, 3, 186, 1991.

"The Effect of Induced Spatial Incoherence on the Absolute Raman Instability", P.N. Guzdar, W. Tan, Y.C. Lee, C.S. Liu, R.H. Lehmberg, Physics of Fluids B, 3, 776, 1991.

"The Effect of Bandwidth on the Connective Raman Instability in Inhomogeneous Plasmas", P.N. Guzdar, C.S. Liu, R.H. Lehmberg, Physics of Fluids B, 3, 2882, 1991.

"Increased X-Ray Conversion Efficiency from Gold Plasmas Irradiated With Spatially and Temporally Incoherent Light", D.R. Kania, W.L. Kruer, P. Bell, S.P. Obenschain, K. Kearney, A Mostovych, Physics of Fluids B, 6, 1496, 1991.

"A Segmented Concentric Faraday Cup for Measurement of Time-Dependent Relativistic Electron Beam Profiles", T. A. Peyser, J. A. Antoniadis, M. C. Myers, M. Lampe, R. E. Pechacek, D. P. Murphy, R. A. Meger, Review of Scientific Instruments, 62 (12), 2895, 1991.

"Reduction of  $3\sigma/2$  Emission From Laser-Produced Plasmas with Broad Bandwidth. Induced Spatial Incoherence at 0.53  $\mu\text{m}$ ", T. A. Peyser, C. K. Manka, S. P. Obenschain, K. J. Kearney, Physics of Fluids B, 3 (6), 1479, 1991.

"The Dense Z-Pinch: An Alternative Approach to Fusion", J. D. Sethian, A. E. Robson, Journal of Fusion Energy, 10 (4), 329, 1991.

"Neutron Production in Dense X-Pinch Plasmas Produced From Deuterated Polyethylene Fibers", K. C. Mittal, D. H. Kalantar, N. Qi, D. A. Hammer, K. A. Gerber, J. D. Sethian, Journal of Applied Physics, 70 (11), 6712, 1991.

"Plasma Reflectors for Electronic Beam Steering in Radar Systems", W.M. Manheimer, IEEE Transactions on Plasma Science, 19, 1228, 1991.

"Lower-Hybrid- Drift Instability and Radiative Collapse of a Dense Z-Pinch." A.E. Robson, Physics of Fluids B, 3, 1461, 1991.

"A Small Fusion Reactor Based on the Dense Z-Pinch", A.E. Robson, Fusion Technology, 20, 858, 1991.

"Wire-Guided Transport of Intense Ion Beams", J.J. Watrous, D. Mosher, J.M. Neri, P.F. Ottinger, C.L. Olson, J.T. Crow, R.R. Peterson, Journal of Applied Physics, 69, 639, 1991.

"Investigation of Plasma Opening Switch Conduction and Opening Mechanisms", B.V. Weber, R.J. Commisso, P.J. Goodrich, J.M. Grossmann, D.D. Hinshelwood, J.C. Kellogg, P.F. Ottinger, IEEE Transactions on Plasma Science, 19, 757, 1991.

"Implosions of NaF Plasmas for Photopumping a Na-Ne X-ray Laser", F.C. Young, D.D. Hinshelwood, J.P. Apruzese, C. Deeney, T. Nash, R.R. Prasad, Journal of Applied Physics, 69, 7520, 1991.

"Triggered Vacuum Flashover Switch for High-Power Applications", J.C. Kellogg, J.R. Boller, R.J. Commisso, D.J. Jenkins, R.D. Ford, J.D. Shipman, W.H. Lupton, Review of Scientific Instruments, 62, 2689, 1991.

"Z-Discharge Transport of Intense Ion Beams for Inertial Confinement Fusion", P.F. Ottinger, D.V. Rose, D. Mosher, J.M. Neri, Journal of Applied Physics, 70, 5292, 1991.

"Absorption at the Ion-Ion Hybrid Resonance in the Presence of Incoherent Density Fluctuations", H. Romero, G.J. Morales, Physics of Fluids B, 3 (11), 2960, 1991.

"Analysis of Standing Wave Patterns in VLF Transmitter Signals: Effects of Sporadic E Layers and In-situ Measurements of Low Electron Densities." C.L. Siefring, M.C. Kelley, Journal of Geophysical Research, 96, 17826, 1991.

"Observation of High-Pressure Blast Wave Decursors", J. Grun, J. Stamper, C. Manka, J. Resnick, R. Burris, B.H. Ripin, Applied Physics Letters, 59, 246, 1991.

"Differential Memory in the Earth's Magnetotail", G.R. Burkhart, J. Chen, Journal of Geophysical Research, 96, 14033, 1991.

"Effects of Collisions on the Nonlinear Particle Dynamics in the Magnetotail", D.L. Holland, J. Chen, Geophysical Research Letters, 18 (8), 1579, 1991.

"Excitation of Artificial Airglow by High Power Radio Waves from the Sura Ionospheric Heating Facility." P.A. Bernhardt, W.A. Scales, S.M. Grach, A.N. Keroshtin, D.S. Kotik, S.V. Polyakov, Geophysical Research Letters, 18 (8), 1477, 1991.

"Existence of Quasihelically Symmetric Stellarators", D.A. Garren, A.H. Boozer, Physics of Fluids B, 3 (10), 2822, 1991.

"Field-Aligned Dynamics of Chemically Induced Perturbations to the Ionosphere", P.A. Bernhardt, P. Rodriguez, C.L. Siefring, Journal of Geophysical Research, 96 (A8), 13887, 1991.

"Harmonic H+ Gyrofrequency Structures in Auroral Hiss Observed by High-Altitude Auroral Sounding Rockets", P.M. Kintner, W. Scales, J. Vago, A. Yau, B. Whalen, R. Arnoldy, T. Moore, Journal of Geophysical Research, 96 (A6), 9627, 1991.

"Instability of Taylor-Sedov Blast Waves Propagating Through a Uniform Gas", J. Grun, J. Stamper, C. Manka, J. Resnick, R. Burris, J. Crawford, B.H. Ripin, Physical Review Letters, 66 (21), 2738, 1991.

"Low-Frequency Oscillations Associated with a Polar Cap Auroral Arc: Local Spectral Density Estimation", D.N. Walker, P.K. Chaturvedi, M. Singh, P. Rodriguez, C.L. Siefring, M.M. Baumbach, Journal of Geophysical Research, 96 (A3), 3589, 1991.

"Magnetic Field Strength of Toroidal Plasma Equilibria", D.A. Garren, A.H. Boozer, Physics of Fluids B, 3 (10), 2805, 1991.

"Reconnection Voltage as a Function of IMF Clock Angle", J.A. Fedder, C.M. Mobarry, J.G. Lyon, Geophysical Research Letters, 18 (6), 1047, 1991.

"Simulation of High-Speed (Orbital) Releases of Electron Attachment Materials in the Ionosphere", W.A. Scales, P.A. Bernhardt, Journal of Geophysical Research, 96 (A8), 13815, 1991.

"Soft X-ray Continuum from Laser-Irradiated High-Z Targets", G. Mehlman, P.G. Burkhalter, D.A. Newman, B.H. Ripin, Journal of Quantitative Spectroscopy Radiation Transfer, 45 (4), 225, 1991.

"Structure of the Dissipation Region During Magnetic Reconnection in Collisionless Plasma", G.R. Burkhart, J.F. Drake, J. Chen, Journal of Geophysical Research, 96 (A7), 11539, 1991.

"Theory and Simulation of a High-Frequency Magnetic Drift Wave", J.D. Huba, Physics of Fluids B, 3 (12), 3217, 1991.

"The Autonomous Chaotic Relaxation Oscillator: An Electrical Analogue to the Dripping Faucet", P.A. Bernhardt, *Physica D*, 52, 489, 1991.

"A Solvable Self-Similar Model of the Sausage Instability in a Resistive Z Pinch", M. Lampe, *Physics of Fluids B*, 3 (7), 1521, 1991.

"Beam Divergence from Sharp Emitters in a General Longitudinal Magnetic Field", Y.Y. Lau, D.G. Colombant, M.D. Pilloff, *Journal of Applied Physics*, 70 (1), 4, 1991.

"Beam Trapping in a Modified Betatron Accelerator", C.A. Kapetanacos, D. Dialetis, S.J. Marsh, L.K. Len, T. Smith, *Physical Review A*, 44, 3900, 1991.

"Cold Tests of Quasi-Optical Gyrotron Resonators", R.P. Fischer, T.A. Hargreaves, A.W. Fliflet, *IEEE Transactions on Microwave Theory and Techniques*, 39, 1010, 1991.

"Comment on Nondiffracting Beams", P. Sprangle, B. Hafizi, *Physical Review Letters*, 66, 837, 1991.

"Compact High-Current Accelerators and Their Prospective Applications", C.A. Kapetanacos, L.K. Len, T. Smith, D. Dialetis, S.J. Marsh, P. Loschialpo, J. Golden, J. Mathew, J.H. Chang, *Physics of Fluids B*, 3 (8), 2396, 1991.

"Critique of Nondiffracting Beams", B. Hafizi, P. Sprangle, *Comments on Plasma Physics and Controlled Fusion*, 14, 297, 1991.

"Deflection of Electron Beams by Ground Planes", R.F. Fernsler, M. Lampe, *Physics of Fluids B*, 3 (11), 3177, 1991.

"Depressed Collector Experiments on a Quasioptical Gyrotron", T.A. Hargreaves, A.W. Fliflet, R.P. Fischer, M.L. Barsanti, *Physics of Fluids B*, 3 (11), 3171, 1991.

"Diffraction Effects in Directed Radiation Beams", B. Hafizi, P. Sprangle, *Journal of Optical Society of America A*, 8, 705, 1991.

"Diffusion of Magnetic Fields in a Toroidal Conducting Shell of Circular Cross Section", D. Dialetis, L.K. Len, J. Golden, C.A. Kapetanacos, *Journal of Applied Physics*, 69 (4), 1813, 1991.

"Electron-Hose Instability in the Ion-Focused Regime", D.H. Whittum, W.M. Sharp, S.S. Yu, M. Lampe, G. Joyce, *Physical Review Letters*, 67, 991, 1991.

"Elimination of Laser Prepulse by Relativistic Guiding in a Plasma", P. Sprangle, A. Zigler, E. Esarey, *Applied Physics Letters*, 58 (4), 346, 1991.

"Evolution of a Finite Pulse of Radiation in a High-Power Free-Electron Laser", A. Ting, B. Hafizi, P. Sprangle, C. M. Tang, *IEEE Journal of Quantum Electronics*, 27, 2529, 1991.

"Experimental, Theoretical, and Numerical Investigation of the Homogenization of Density Nonuniformities in the Periodic Transport of a Space-Charge Dominated Beam", I. Haber, D. Kehne, M. Reiser, H. Rudd, *Physical Review A*, 44, 5194, 1991.

"Frequency Up-Shifting of Laser Pulses by Copropagating Ionization Fronts", E. Esarey, G. Joyce, P. Sprangle, *Physical Review A*, 44, 3908, 1991.

"High-Voltage Millimeter-Wave Gyro-Traveling-Wave Amplifier", S.H. Gold, D.A. Kirkpatrick, A.W. Fliflet, R.B. McCowan, A.K. Kinkead, D.L. Hardesty, M. Sucey, Journal of Applied Physics, 69 (9), 6696, 1991.

"Kinetic Stabilization of Interchange Modes in an Axisymmetric Mirror by Large Orbit Radius Thermal Ions", J. Krall, C.E. Seyler, R.N. Sudan, Physics of Fluids B, 3 (4), 1015, 1991.

"Octupole Correction of Geometric Aberrations for High-Current Heavy-Ion Beams", D.D. M. Ho, I. Haber, K.R. Crandall, S.T. Brandon, Particle Accelerators, 36, 141, 1991.

"Ohmic Effects in Quasioptical Resonators", T.A. Hargreaves, R.P. Fischer, R.B. McCowan, A.W. Fliflet, International Journal of Infrared and Millimeter Waves, 12, 9, 1991.

"Output Switch for a Megavolt Electron Beam Generator", J. Mathew, J. Golden, Review of Scientific Instruments, 62 (6), 1514, 1991.

"Patterning Tungsten Films with an Electron Beam Lithography System at 50 keV for X-ray Mask Applications", K.W. Rhee, A.C. Ting, L.M. Shirey, K.W. Foster, J.M. Andrews, M.C. Peckerar, Y.C. Ku, Journal of Vacuum Science Technology B, 9 (6), 3292, 1991.

"Quantum Extension of Child-Langmuir Law", Y.Y. Lau, D. Chernin, D.G. Colombant, P.T. Ho, Physical Review Letters, 66, 1446, 1991.

"Recent Advances in Free Electron Laser Theory", C.M. Tang, Nuclear Instruments and Methods A, 304, 526, 1991.

"Reduction of Beam Breakup Growth by Cavity Cross-Couplings in Recirculating Accelerators", D. Colombant, Y.Y. Lau, D. Chernin, Particle Accelerators, 35, 193, 1991.

"Simulation of Free-Electron Lasers in the Presence of Correlated Magnetic Field Errors", W.P. Marable, C. Tang, E. Esarey, IEEE Journal of Quantum Electronics, 27, 2693, 1991.

"Stability Regimes in a Helical Quadrupole Focusing Accelerator - Theory and Simulation", J. Krall, C.M. Tang, G. Joyce, P. Sprangle, Physics of Fluids B, 3 (1), 204, 1991.

"Status Report on the NIST-NRL Free Electron Laser", P.H. Debenham, R.L. Ayres, W.A. Cassatt, B.C. Johnson, R.G. Johnson, E.R. Lindstrom, P.J. Liposky, A.B. Marella, D.L. Mohr, J.K. Whittaker, N. D. Wilkin, M.A.D. Wilson, C. Tang, P. Sprangle, S. Penner, 1991.

"Stimulated Backscattered Harmonic Generation from Intense Laser Interactions with Beams and Plasmas", P. Sprangle, E. Esarey, Physical Review Letters, 67, 2021, 1991.

"Studies of Synchrotron Radiation Emission from the Modified Betatron Accelerator", T.J. Smith, J. Golden, C.A. Kapetanacos, Journal of Applied Physics, 69 (10), 6836, 1991.

"The Effects of Field Errors on Low-Gain Free-Electron Lasers", E. Esarey, C. Tang, W.P. Marable, IEEE Journal of Quantum Electronics, 27, 2682, 1991.

"Theoretical Analysis of Radiation Pulses in the NIST/NRL FEL Oscillator", C.M. Tang, B. Hafizi, Nuclear Instruments and Methods A, 304, 497, 1991.

"Theoretical Consequences of Wiggler Field Error Reduction Techniques on Free-Electron Laser Performance", W.P. Marable, E. Esarey, C.M. Tang, Physics of Fluids B, 3 (3), 781, 1991.

"Theory of Electron-Beam Tracking in Reduced-Density Channels", R.F. Fernsler, S.P. Slinker, R.F. Hubbard, Physics of Fluids B, 3 (9), 2696, 1991.

"Theory of Wake-Field Effects of a Relativistic Electron Beam Propagating in a Plasma", H.S. Uhm, G. Joyce, Physics of Fluids B, 3 (7), 1587, 1991.

"Time-Dependent Multimode Simulation of Gyrotron Oscillators", A.W. Fliflet, R.C. Lee, S.H.Gold, W.M. Manheimer, E. Ott, Physical Review A, 43, 11, 6166, 1991.

"Vlasov Simulations of Very-Large-Amplitude-Wave Generation in the Plasma Wake-Field Accelerator", J. Krall, G. Joyce, E. Esarey, Physical Review A, 44, 6854, 1991.

"Large Electron Accelerators Powered by Intense Relativistic Electron Beams", M. Friedman, V. Serlin, Y.Y. Lau, J. Krall, Proceedings of Intense Microwave and Particle Beams II, SPIE, 1407, 474, 1991.\*

"Relativistic Klystron Amplifier I - High Power Operation", M. Friedman, V. Serlin, Y.Y. Lau, J. Krall, Proceedings of Intense Microwave and Particle Beams II, SPIE, 1407, 8, 1991.\*

"Relativistic Klystron Amplifier II: High Frequency Operation", V. Serlin, M. Friedman, Y.Y. Lau, J. Krall, Proceedings of Intense Microwave and Particle Beams II, SPIE, 1407, 2, 1991.\*

IFR Cell Radius Tailoring on SuperIBEX", J. Antoniadis, M. Myers, D. Murphy, T. Peyser, R. Hubbard, R. Fernsler, R. Pechacek, R. Meger, Proceedings of the 8th IEEE Pulsed Power Conference, p. 582, 1991.\*

"Relativistic Electron Beam Tracking of Reduced Density Channels in Normal Density Air", D. Murphy, R. Pechacek, J. Antoniadis, T. Peyser, M. Myers, R. Fernsler, R. Hubbard, R. Meger, Proceedings of the 8th IEEE Pulsed Power Conference, p. 589, 1991.\*

"High Current Relativistic Electron Beam Propagation in High Neutral Pressure Environments", J. Antoniadis, M. Myers, D. Murphy, R. Hubbard, T. Peyser, R. Pechacek, R. Meger, Proceedings of the 8th IEEE Pulsed Power Conference, p. 585, 1991.\*

Vacuum Insulator Flashover Measurements for Microsecond Pulses", J.R. Boller, P.J. Goodrich, J.D. Shipman, Jr., S.J. Stephanakis, R.J. Commisso, Proceedings of the 8th IEEE Pulsed Power Conference, p. 893., 1991.\*

"Plasma Opening Switch Experiments on Hawk with an E-Beam Diode Load", P.J. Goodrich, J.R. Boller, R.J. Commisso, D.D. Hinshelwood, J.C. Kellogg, B.V. Weber, Proceedings of the 8th IEEE Pulsed Power Conference, p. 515, 1991.\*

"A Parametric Study of the Solar Wind Interaction with Comets", C.T. Russell, G. Le, J.G. Luhmann, J.A. Fedder, Geophysical Monograph, No. 61, American Geophysical Union, p. 65, 1991.

"Role of Small Scale Processes in Global Plasma Modelling", G. Ganguli, Y.C. Lee, P.J. Palmadesso, Geophysical Monograph No. 62, American Geophysical Union, p. 17, 1991.

"Beam Divergence From Sharp Emitters in a General Longitudinal Magnetic Field", Y.Y. Lau, D.G. Colombant, Proceedings of the Short-Wavelength Radiation Sources Conference, p. 182, 1991.\*

"Gas Puff Z-Pinch X-Ray Source - A New Approach", A. Fisher, Proceedings of the Short-Wavelength Radiation Sources Conference SPIE, 1552, p. 252, 1991.\*

"Harmonic Generation by an Intense Picosecond Laser in an Underdense Plasma", X. Liu, J.S. Coe, C.Y. Chien, D. Umstadter, E. Esarey, P. Sprangle, Proceedings of the Short-Wavelength Coherent Radiation Fifth Topical Meeting, p. 7, 1991.\*

"Simulated Relativistic Harmonic Generation from Intense Laser Interactions with Beams and Plasmas", P. Sprangle, E. Esarey, Proceedings of the Short-Wavelength Radiation Sources Conference, SPIE, 1552, p. 147, 1991.\*

"Simulation of Free Electron Lasers in the Presence of Measured Magnetic Field Errors of the Undulator", W.P. Marable, C.M. Tang, E. Esarey, Proceedings of the Short-Wavelength Radiation Sources Conference, SPIE, 1552, p. 80, 1991.\*

"Beam Divergence From Sharp Emitters in a General Longitudinal Magnetic Field", Y.Y. Lau, D.G. Colombant, M.D. Pilloff, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 635, 1991.\*

"Nonlinear Wakefield Generation and Relativistic Optical Guiding of Intense Laser Pulses in Plasmas", E. Esarey, P. Sprangle, A. Ting, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 407, 1991.\*

"Quantum Extension of Child-Langmuir Law", Y.Y. Lau, D. Chernin, D.G. Colombant P.T. Ho, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 546, 1991.\*

"Recent Developments on the NRL Modified Betatron Accelerator", J. Golden, L.K. Len, T.J. Smith, D. Dialetis, S.J. Marsh, K. Smith, J. Mathew, P. Loschialpo, L. Seto, J.H. Chang, C.A. Kapetanacos, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE 1407, p. 418, 1991.\*

"Reduction of Beam Breakup Growth by Cavity Cross-Couplings in Recirculating Accelerators", D. Colombant, Y.Y. Lau, D. Chernin, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 484, 1991.\*

"Relativistic Klystron Amplifiers III: Dynamical Limiting Currents, Nonlinear Beam Loading and Conversion Efficiency", D.G. Colombant, Y.Y. Lau, M. Friedman, J. Krall, V. Serlin, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 13, 1991.\*

"Relativistic Klystron Amplifier IV: Simulation Studies of a Coaxial-Geometry RKA", J. Krall, M. Friedman, Y.Y. Lau, V. Serlin, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 23, 1991.\*

"Some Issues on Beam Breakup in Linear Accelerators", Y.Y. Lau, D.G. Colombant, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 479, 1991.\*

"Reduction of Beam Breakup Growth by Bleeding Cavities in Linear Accelerators", D.G. Colombant, Y.Y. Lau, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 1609, 1991.\*

"Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System", C. Tang, J. Krall, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 1788, 1991.\*



"Efficiency and Frequency Stability in a High Power Microwave Gap", Y.Y. Lau, D.G. Colombant, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 637, 1991.\*

"3d and r.z Particle Simulation of Beams for Heavy Ion Fusion: the WARP Code", A. Friedman, D.P. Grote, D.A. Callahan, A.B. Langdon, I. Haber, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 263, 1991.\*

"Beam Dynamics in the Spiral Line Induction Accelerator", S. Slinker, J. Krall, M. Lampe, G. Joyce, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 242, 1991.\*

"Observation of Plasma Wakefield Effects During High- Current Relativistic Beam Transport", J.D. Miller, R.F. Schneider, K.T. Nguyen, G. Joyce, D.J. Weidman, J. Goldhar, H.S. Uhm, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 239, 1991.\*

"Vlasov-Maxwell Simulations of Nonlinear Plasma Dynamics in the Plasma Wakefield Accelerator", J. Krall, G. Joyce, E. Esarey, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 2563, 1991.\*

"1 MV Long Pulse Generator with Low Ripple and Low Droop", N.C. Jaitly, M. Coleman, S. Eckhouse, A. Ramrus, S.H. Gold, R.B. McCowan, C.A. Sullivan, Proceedings of the 8th IEEE International Pulsed Power Conference, p. 161, 1991.\*

"Development of Efficient, High Power Millimeter-Wave Sources for Space Power Beaming", A.W. Fliflet, S.H. Gold, W.M. Manheimer, Proceedings of the Power Beaming Workshop, p. T11.1, 1991.\*

"Design of a High Perveance, Field-Immersed Magnicon", S.H. Gold, B. Hafizi, W.M. Manheimer, C.A. Sullivan, Proceedings of the 16th International Conference on Infrared and Millimeter Waves, p. 4, 1991.\*

"Multimode Simulation of High Frequency Gyrotrons", S.H. Gold, A.W. Fliflet, Proceedings of the 16th International Conference on Infrared and Millimeter Waves, p. 53, 1991.\*

"A Comparison of Methods for Simulating Low Dose-Rate Gamma Ray Testing of MOS Devices", W.C. Jenkins, R.L. Martin, IEEE Transactions on Nuclear Science, 38(6), 1560, 1991.

"A Microwave Equivalent Circuit Model for Semiconductor Alloy Ramp", G.B. Tait, H.S. Newman, Microwave and Optical Technology Letters, 4(3), 91-97, 1991.

"Advanced Channelization Technology for RF, Microwave, and Millimeterwave Applications", G.W. Anderson, D.C. Webb, A.E. Spezio, J.N. Lee, IEEE, 79(3), 355, 1991.

"Antiplasticization Effects on a Secondary Relaxation in Plasticized Glassy Polycarbonates", K.L. Ngai, R.W. Rendell, A.F. Yee, D.J. Plazek, Macromolecules, 24, 61-67, 1991.

"Be, S, Si, and Ne Ion Implantation in InSb Grown on GaAs", V.R. Mulpuri, P.E. Thompson, R. Echard, S. Mulpuri, A.K. Berry, H.B. Dietrich, J. Appl. Phys., 69(8), 4228-4233, 1991.

"Characteristics of Microstrip Transmission Lines with High-Dielectric-Constant Substrates", A.K. Ganguly, C.M. Krowne, IEEE Transactions on Microwave Theory and Techniques, 39(8), 1329-1337, 1991.

"Comment on Temperature-Induced Intraband Transitions in the n-Type HgTe/CdTe Superlattice", J.R. Meyer, C.A. Hoffman, R.J. Wagner, F.J. Bartoli, Physical Review B, 43(18), 14715, 1991.

"The Effect of Charge State on the Local Vibrational Mode Absorption of the Carbon Acceptor in Semi-Insulating GaAs", W.J. Moore, B.V. Shanabrook, Journal of Applied Physics, 69(9), 6731, 1991.

"Convolution Integral Formulation of Dispersive Diffusion Transport: Numerical Solutions for the Coupling Model Waiting Time Distribution", R.W. Rendell, K.L. Ngai, Journal of Non-Crystalline Solids, 131-133, 667-670, 1991.

"Correlation of Polymer Segmental Chain Dynamics with Temperature-Dependent Time-Scale Shifts", D.J. Plazek, K.L. Ngai, Macromolecules, 1221-1224, 1991.

"Correspondence Between the Coupling Model Predictions and Computer Simulations: Diffusion of a Probe Polymer in a Matrix Having Different Degrees of Polymerization", K.L. Ngai, J. Skolnick, Macromolecules, 24, 1561-1566, 1991.

"Coupling Scheme Applied to Solvent Relaxation Modified by Dissolved Polymer Molecules", K.L. Ngai, Journal of Polymer Science B: Polymer Physics, 29, 867-876, 1991.

"Couplings Between the Cooperatively Rearranging Regions of the Adam-Gibbs Theory of Relaxation in Glass-Forming Liquids", J.L. Ngai, R.W. Rendell, D.J. Plazek, Journal of Chemical Physics American Institute of Physics, 94(4), 3018-3029, 1991.

"Deep Ultraviolet Patterning of Monolayer Films for High Resolution Lithography", J.M. Calvert, M.-S. Chen, C.S. Dulcey, J.H. Georger, M.C. Peckerar, J.M. Schnur, P.E. Schoen, Journal of Vacuum Science and Technology, B9(6), 3447-3450, 1991.

"Deep UV Patterning of Monolayer Films for High Resolution Lithography", M.S. Chen, J.H. Georger, Jr., M.C. Peckerar, J.M. Calvert, C.S. Dulcey, J.M. Schnur, P.E. Schoen, Journal of Vacuum Science and Technology B, 9(6), 3447-3450, 1991.

"Design Parameters of a High Efficiency 1.7 GHz Gyroresonator Amplifier", A.K. Ganguly, S. Ahn, E.G. Zaidman, A.S. Gilmour, Jr., IEEE Transactions on Electron Devices, 38(10), 2229-2233, 1991.

"Detection of Ferromagnetic Resonance in Metallic Glass by Fiber Interferometric Strain Measurement", D.M Dagenais, F. Bucholtz, K.P. Koo, S. Vohra, J.M. Pond, Appl. Phys. Lett. 58 (5), 58(4), 1991.

"Detection of Light Using High Temperature Superconducting Microstrip Lines", J.C. Culbertson, H.S. Newman, U. Strom, J.M. Pond, D.B. Chrisey, J.S. Horwitz, S.A. Wolf, IEEE Transactions on Magnetics, 27(2), 1536, 1991.

"Dielectric Breakdown Strength Analysis of SiO<sub>2</sub> Using a Stepped-Field Method", E.A. Sprangle, J.M. Andrews, M.C. Peckerar, Proceedings of the 3rd Int'l. Symposium on Ultra Large scale Integration Science and Technology, 91(11), 409-415, 1991.\*

"Diffusion with a Memory: A Model for Mixed Alkali Effect in Vitreous Ionic Conductors", A. Bunde, M.D. Ingram, P. Maass, K.L. Ngai, Journal of Physics A: Math. Gen., 24, L881 - L886, 1991.

"Dynamic Linear Response", A.K. Rajagopal, S. Teitler, Physical Review, 43(4), 2059-2061, 1991.

"Dynamical Heterogeneity in a Miscible Polymer Blend", C.M. Roland, K.L. Ngai, Macromolecules, 2261-2265, 1991.

"Effects of Neutron and Electron Irradiation on the Absorption Edge of GaAs", M. Parenteau, C. Carlone, M. Aubin, S.M. Khanna, W.T. Anderson, J.W. Gerdes, Jr., Canadian Journal of Physics, 69(3-4), 324-328, 1991.

"Effects of Switched Gate Bias on Radiation-Induced Interface Trap Formation", N.S. Saks, D.B. Brown, R.W. Rendell, IEEE Transactions on Nuclear Science, 38(6), 1130-1139, 1991.

"Electron Paramagnetic Resonance and Optically-Detected Magnetic Resonance of Donors in Al<sub>x</sub>Ga<sub>1-x</sub>As", T.A. Kennedy, E. Glaser, Journal of Electronic Materials, 20(1), 49, 1991.

"Electron Transport in Rectifying Semiconductor Alloy Ramp Heterostructures", G.B. Tait, C.R. Westgate, IEEE Transactions on Electron Devices, 38(6), 1262-1270, 1991.

"Electroreflectance Studies of Asymmetrically Coupled Quantum Wells", O.J. Glembocki, E.S. Snow, R.W. Little, R.P. Leavitt, Superlattices and Microstructures, Academic Press, London, UK, 10, 77-82, 1991.

"Enhanced Photoemission from a Bi-Metallic LaB<sub>6</sub>/Au Photocathode", C.J. Scott, X. Tang, M.G. Spencer, App. Phys. Lett, 58(16), 1795, 1991.

"Enhancement of 2-Dimensional Electron Gas Mobility for Inverted Modulation-Doped Field-Effect Transistor Structures, and the Application of Low Temperature Buffers on the Inverted Structures", B. Tadayon, S. Tadayon, M.J. Yang, S. Katzer, H. Dietrich, The Electrochemical Society Proceedings, 91(13), 207-218, 1991.\*

"Epitaxial Growth of b-SiC on Silicon-on-Sapphire Substrates by Chemical Vapor Deposition", J.C. Pazik, G. Kelner, N. Bottka, Appl. Phys. Lett., 58(13), 1419-1421, 1991.

"Etching Studies of Stress-Induced Surface Polygonization in Si GaAs Wafers", Materials Letters, 10(9-10), 400-403, 1991.

"Evaluation of Pulsed Radiation Effects in Buried Oxides by Fast C-V Measurements", M. Simons, G. Campisi, H.L. Hughes, J. Appl. Phys, 70(9), 4784-4789, 1991.

"Evidence of Modification of Solvent Re-Orientation Dynamics from Depolarized Rayleigh Spectra of Polymer in Aroclor Solutions", G. Fytas, K.L. Ngai, Journal of Non-Crystalline Solids, 131-133, 544-550, 1991.

"Exciton, Phonons, and Interfaces in GaAs/AlAs Quantum-Well Structures", D. Gammon, B.V. Shanabrook, D.S. Katzer, Physical Review Letters, 67(12), 1547, 1991.

"Field Emission Triodes", R.E. Neidert, P.M. Phillips, S.T. Smith, C.A. Spindt, IEEE Transactions on Electron Devices, 38(3), 661-665, 1991.

"Formation of Interface Traps in MOS Devices During Isochronal Annealing After Irradiation at 78 K." N.S. Saks, R.B. Klein, S. Yoon, D.L. Griscom, Journal of Applied Physics, 70(12), 7434-7442, 1991.

"From Conformational Transitions in a Polymer Chain to Segmental Relaxation in a Bulk Polymer", K.L. Ngai, R.W. Rendell, Journal of Non-Crystalline Solids, 131-133, 942-948, 1991.

"Gallium Interstitials in GaAs/AlAs Superlattices", J.M. Trombetta, T.A. Kennedy, W. Tseng, D. Gammon, Physical Review B, 43(3), 2458, 1991.

"Generalized Pairing Theory of Superconductivity in Layered Crystals", A.K. Rajagopal, S.S. Jha, Physica C, 174, 161-179, 1991.

"Growth of (100) GaAs by Vertical Zone Melting", R.L. Henry, P.E.R. Nordquist, R.J. Gorman, S.B. Qadri, Journal of Crystal Growth, 109, 228-233, 1991.

"Growth of Ultrathin Ni Layers on Ni(100): Infrared Spectroscopy of Adsorbed Carbon Monoxide as a Structural Probe", V.M. Bermudez, J. Vac. Sci. Technol A, 9(6), 3169-3172, 1991.

"High Mobility InSb Grown by Organometallic Vapor Phase Epitaxy", D.K. Gaskill, G.T. Stauf, N. Bottka, Appl. Phys. Lett., 58(17), 1905-1907, 1991.

"High Resolution Electron Beam Lithography with a Polydiacetylene Negative Resist at 50 kV", E.A. Dobisz, C.R.K. Marrian, R.J. Colton, Journal of Applied Physics, 70(3), 1793-1799, 1991.

"High Temperature Operation of a-Silicon Carbide Buried-Gate Junction Field Effect Transistors", G. Kelner, S. Binari, M. Shur, J. Palmour, Electronic Letters, 27(12), 1038-1040, 1991.

"High Temperature Superconductivity Space Experiment", M. Nisenoff, D.U. Gubser, S.A. Wolf, J.C. Ritter, G. Price, Superconductor Science and Technology, 4, 449-452, 1991.

"High-Energy Si Implantation into InP:Fe", R.K. Nadella, M.V. Rao, D.S. Simon, P.H. Chi, M. Fatemi, H.B. Dietrich, Journal of Applied Physics, 70(3), 1750 - 1757, 1991.

"High-Tc Superconductivity of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>/PrBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> Superlattices: An Interlayer-Coupling Model", A.K. Rajagopal, S.D. Mahanti, Physical Review B, 44(18), 10 210, 1991.

"Hybrid-Mode Fields in Isotropic and Anisotropic Planar Microstrip Structures", A.A. Mostafa, C.M. Krowne, K.A. Zaki, S. Tantawi, Journal of Electromagnetic Waves and Applications, 5(6), 577-606, 1991.

"Implantation Damage in GaAs-AlAs Superlattices of Different Layer Thickness", E.A. Dobisz, M. Fatemi, H.B. Dietrich, A.W. McCormick, J.P. Harbison, Appl. Phys. Lett., 59(11), 1338-1340, 1991.

"In 0.53 Ga0.47As Metal-Semiconductor-Metal Photodetector Using Light-Ion Bombarded p-Type Material", M. Rao, W. Hong, C. Caneau, G. Chang, N. Papanicolaou, H. Dietrich, J. Appl. Phys. American Institute of Physics, 70(7), 3943-3945, 1991.

"In-Situ Determination of Flux Nonuniformities During Molecular Beam Epitaxial Growth", B.V. Shanabrook, D.S. Katzer, R.J. Wagner, Applied Physics Letters, 59(11), 1317, 1991.

"InAlAs/InGaAs/InP HEMTs with High Breakdown Voltages Using a Double-Recess Gate Process", J. Boos, W. Kruppa, IEE Electronics Letters (IEE/London, UK), 27(21), 1909-1910, 1991.

"Infrared Reflection Absorption Spectroscopy of Adsorbates on Semiconductors with Buried Metal Layers - O<sub>2</sub>/GaAs." V.M. Bermudez, S.M. Prokes, Surface Science, 248, 201-206, 1991.

"Infrared Reflection Absorption Spectroscopy Study of Chemisorption on the Ni(001)-c(2x2)Si Surface", M. McGonigal, V.M. Bermudez, Surface Science, 241, 357-368, 1991.

"Intrinsic High-Frequency Oscillations and Equivalent Circuit Model in the Negative Differential Resistance Region of Resonant Tunneling Devices", F.A. Buot, K.L. Jensen, COMPEL - The International Journal for Computation and Mathematics in Electrical and Electronic Engineering, 10(4), 241-253, 1991.

"Investigations of Undeveloped E-Beam Resist with a Scanning Tunneling Microscope", C.R.K. Marrian, E.A. Dobisz, R.J. Colton, J. Va. Sci. Technology., B9(2), 1367, 1991.

"Ion-Beam Deposition of Ag/Fe Multilayers and their Structural and Magnetic Properties", S.B. Qadri, C. Kim, M. Twigg, P. Lubitz, M. Rubinstein, Journal Vac. Sci. Technology, A9(3), 512-513, 1991.

"Kinetics of Silicide Formation in Chromium-Amorphous Silicon Multilayered Films", T.E. Schlesinger, R.C. Cammarata, S.M. Prokes, Applied Physics Letters, 59(4), 449-451, 1991.

"Light Detection Using High Tc Microstrip Transmission Lines as a Probe of Film Homogeneity", J.C. Culbertson, H.S. Newman, U. Strom, J.M. Pond, D.B. Chrisey, J.S. Horwitz, S.A. Wolf, Journal of Applied Physics, 70(9), 4995, 1991.

"Light-Activated Telegraph Noise in AlGaAs Tunnel Barriers: Optical Probing of a Single Defect", P.M. Campbell, S.W. Kirchoefer, E.S. Snow, W.J. Moore, O.J. Glembocki, Physical Review Letters, 67(10), 1330-1333, 1991.

"Line Tension of Extended Double Kinks in Thin Films", M.E. Twigg, J. Appl. Phys., 68(10), 5109-5114, 1991.

"Linearized Gap Equation for a Superconductor in a Strong Magnetic Field", A.K. Rajagopal, R. Vasudevan, Physical Review B, 44(6), 2807-2810, 1991.

"Localized Segmental Motion and Brillouin Scattering in a Polymer Liquid", C.H. Wang, B.Y. Li, R.W. Rendell, K.L. Ngai, Journal of Non-Crystalline Solids, 131-133, 870-876, 1991.

"Low-Temperature Organometallic Vapor Phase Epitaxy of InSb Using the Novel Sb Precursor Triisopropylantimony", G.T. Stauf, D.K. Gaskill, N. Bottka, R.W. Gedridge, Jr., Applied Physics Letters, 58(12), 1311-1313, 1991.

"Magnetic Resonance of Sn-doped Al<sub>x</sub>Ga<sub>1-x</sub>As Detected on Photoluminescence", T.A. Kennedy, E.R. Glaser, T.F. Kuech, Semicond. Sci. Technol., 6, B101-B104, 1991.

"Measurement of the Thickness and Optical Properties of Thermal Oxides of Si Using Spectroscopic Ellipsometry and Stylus Profilometry.", B.J. Mrstik, P.J. McMarr, J.R. Blanco, J.M. Bennet, Journal of the Electrochemical Society, 138(6), 1770, 1991.

"Micro-Raman Studies of Fluoride Glass Optical Fibers", J.A. Freitas, P.C. Pureza, I.D. Aggarwal, U. Strom, Materials Science Forum, 67-68, 279-284, 1991.

"Mixed Alkali Effects in Ionic Conductors: A New Model and Computer Simulations", A. Bunde, M.D. Ingram, P. Maass, K.L. Ngai, Journal of Non-Crystalline Solids, 131-133, 1109-1112, 1991.

"Mode Selection by Priming in An Overmoded Electron Cyclotron Maser", A.H. McCurdy, C.M. Armstrong, Physics of Fluids B,, B3(1), 212, 1991.

"Model for Si-SiO<sub>2</sub> Interface State Formation During Irradiation and During Post-Irradiation Exposure to Hydrogen Environment", B.J. Mrstik, Applied Physics Letters, 59(23), 3012-3014, 1991.

"Monolithic Circuit for Reflection Coefficient Measurement", R.E. Neidert, IEEE Microwave and Guided Wave Letters, 1(8), 195-197, 1991.

"Monte Carlo Particle Simulation of Radiation-Induced Heating in GaAs Field-Effect Transistors", C. Moglestue, F.A. Buot, W.T. Anderson, Appl. Phys. Lett., 59(2), 192-195, 1991.

"Nature of the Linear Frequency Dependent AC Conductivity in Glassy Ionic Conductors", U. Strom, K.L. Ngai, O. Kanert, Journal of Non-Crystalline Solids, 131-133, 1011-1017, 1991.

"Nuclear Magnetic Resonance Studies of Strain in Isolvalently Doped GaAs", W.E. Carlos, S.G. Bishop, D.J. Treacy, Physical Review B, 43(15), 12512, 1991.

"Nuclear Spin Relaxation and Atomic Motion in Inorganic Glasses", O. Kanert, J. Steinert, H. Jain, K.L. Ngai, Journal of Non-Crystalline Solids, 131-133, 1001-1010, 1991.

"Numerical Simulation of Intrinsic Bistability and High-Frequency Current Oscillations in Resonant Tunneling Structures", K.L. Jensen, F.A. Buot, Physical Review Letters, 66(8), 1078, 1991.

"OMCVD of Thin Films from Metal Diketonates and Triphenylbismuth", A.D. Berry, R.T. Holm, M. Fatemi, D.K. Gaskill, Journal of Material Resources, 5(6), 1169-1175, 1991.

"Optical and Structural Studies of Si<sub>1-x</sub>Gex/Si Strained Layer Superlattices", S.M. Prokes, O.J. Glembocki, K.L. Wang, Superlattices and Microstructures, 10(1), 113-118, 1991.

"Optical Studies of Dry Etched GaAs", O.J. Glembocki, B.E. Taylor, E. Dobisz, J. Vac. Sci. Technol, B9(2), 3546, 1991.

"Optically-Detected Magnetic Resonance of Donor States in Al<sub>x</sub>Ga<sub>1-x</sub>As (x ≥ 0.35) Doped with Group-IV and Group-VI Impurities", E.R. Glaser, T.A. Kennedy, Materials Science Forum, 83-87, 775-786, 1991.

"Optically-Detected Magnetic Resonance of Group-IV and Group-VI Impurities in AlAs and Al<sub>x</sub>Ga<sub>1-x</sub>As with x ≥ 0.35", E.R. Glaser, T.A. Kennedy, B. Molnar, R.S. Sillmon, M.G. Spencer, M. Mizuta, T.F. Kuech, Physical Review B, 43(14), 14 540 - 14556, 1991.

"Optimization of SIMOX for VLSI by Electrical Characterization", D.E. Ioannou, S. Cristoloveanu, C. Potamianos, X. Zhong, P.K. McLarty, H.L. Hughes, IEEE Transaction on Electron Devices, 38(3), 463, 1991.

"Optoelectronic Approach to On-Chip Device and Circuit Characterization at Microwave and Millimeter-Wave Frequencies", C. Rauscher, IEEE Transactions on Microwave Theory and Techniques, 39(7), 1179-1193, 1991.

"Passive Microelectrode Arrays for Recording of Neural Signals: A Simplified Fabrication Process", M. Peckerar, S.A. Shamma, M. Rebbert, J. Kosakowski, P. Isaacson, Review of Scientific Instruments, 62(9), 2276-2280, 1991.

"Patterning Tungsten Films with an Electron Beam Lithography System at 50 KeV for X-Ray Mask Application", K.W. Rhee, A.C. Ting, L.M. Shirey, K.W. Foster, J.M. Andrews, M.C. Peckerar, Y.C. Ku, Journal of Vac. Sci. Technology, B9(6), 1991.

"Penetration Depth and Microwave Loss Measurements with a YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-d</sub>/LaAlO<sub>3</sub>/YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-d</sub> Trilayer Transmission Line", J.M. Pond, K.R. Carroll, J.S. Horwitz, D.B. Chrisey, M.S. Osofsky, V.C. Cestone, Applied Physics Letters, 59(23), 3033-3035, 1991.

"Phonon-Mediated Indirect Interactions Between Adatoms on Surfaces: O Adatoms on Si(100)", S.C. Tiersten, T.L. Reinecke, S.C. Ying, Physical Review B, 43(14), 12045, 1991.

"Photoluminescence and Magnetic Resonance Studies of Er<sup>3+</sup> in MeV Ion Implanted GaAs", P.B. Klein, F.G. Moore, H.B. Dietrich, Applied Physics Letters, 58(5), 502, 1991.

"Photoluminescence Studies of Polycrystalline Diamond Films", J.A. Freitas, J.E. Butler, U. Strom, Journal of Materials Research, 5(11), 2502, 1991.

"Photoreflectance of Semi-Insulating InP: Resistivity Effects on Exciton Phase", A.K. Berry, D.K. Gaskill, G.T. Stauff, N. Bottka, Appl. Phys. Lett., 58(24), 2824, 1991.

"Post-Irradiation Formation of Si-SiO<sub>2</sub> Interface States in a Hydrogen Atmosphere at Room Temperature", B.J. Mrstik, Journal of Electronic Materials, 20(8), 627-633, 1991.

"Preparation and Characterization of Carbon-Terminated b-SiC(001) Surfaces", V.M. Bermudez, R. Kaplan, Physical Review B, 44(20), 11 149 - 11 158, 1991.

"Preparation and Characterization of MgO Thin Films Deposited by Spray Pyrolysis of Mg(2,4-Pentanedionate)<sub>2</sub>", W.J. DeSisto, R.L. Henry, Journal of Crystal Growth, 109, 314-317, 1991.

"Programmable Analog Vector-Matrix Multiplier Using Capacitive Weight Storage", F.J. Kub, K.K. Moon, J.A. Modolo, SPIE , 1515, 795, 1991.

"Proton Radiation Effects in Microwave Cavities and Ring Resonators Fabricated from YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-8</sub>", B.D. Weaver, J.M. Pond, D.B. Chrisey, J.S. Horwitz, H.S. Newman, Appl. Phys. Lett, 58(14), 1563-1565, 1991.

"Quantum Transport :Novel Approach in the Formulation and Applications to Quantum-Based Solid State Devices", F.A. Buot, K.L. Jensen, COMPEL - The International Journal for Computation and Mathematics in Electrical and Electronic Engineering, 10(4), 509-524, 1991.

"Quantum Translation Invariance and the Superconducting Transition in Layered Bulk Materials", A.K. Rajagopal, P.P. Divakaran, Solid State Communications, 77(7), 525-528, 1991.

"Quantumj-State Representations in Strong Quantizing Magnetic Field: Pairing Theory of Superconductivity", A.K. Rajagopal, J.C. Ryan, Physical Review B, 44(18), 10 280, 1991.

"Raman Scattering Study of Dry Etching of GaAs: A Comparison of Chemically Assisted Ion Beam Etching and Reactive Ion Etching", O.J. Glembocki, E.A. Dobisz, J. Vac. Sci. Technology., B9(2), 1403, 1991.

"Response of Granular Superconducting Y-Ba<sub>2</sub>.1Cu<sub>3</sub>.407-x Films to Light", J.C. Culbertson, U. Strom, S.A. Wolf, W.W. Fuller, Physical Review B, 44(17), 9609, 1991.

"Response of SOS Starting Materials to High Total Dose Irradiation", R.J. Lambert, G.J. Campisi, H.L. Hughes, E.D. Richmond, T.S. Lim, R.H. Hevey, J.G. Pellegrino, Journal of Radiation Effects R&D, 10(1), 45, 1991.

"Scanning Tunneling Microscope Lithography: A Solution to Electron Scattering", E.A. Dobisz, C.R.K. Marrian, J. Vac. Sci. Technol , B9(6), 3024-3027, 1991.

"Selective Removal of a Si<sub>0.7</sub>Ge<sub>0.3</sub> Layer from Si(100)", A.H. Krist, D.J. Godbey, N.P. Green, Appl. Phys. Lett. , 58(17), 1899-1901, 1991.

"Si-SiO<sub>2</sub> Interface State Generation During X-Ray Irradiation and During Post-Irradiation Exposure to a Hydrogen Ambient", B.J. Mrstik, R.W. Rendell, IEEE Transactions on Nuclear Science, 38(6), 1101, 1991.

"Silicon-on-Insulator Device Islands Formed by Oxygen Implantation Through Patterned Masking Layers", U. Bussmann, A.K. Robinson, P.L.F. Hemment, G.J. Campisi, J. Appl. Phys., 70(8), 4584-4592, 1991.

"SIMOX with Epitaxial Silicon: Point Defects and Positive Charge", M.E. Zvanut, R.E. Stahlbush, W.E. Carlos, H.L. Hughes, R.K. Lawrence, R. Hevey, G.A. Brown, IEEE Trans. on Nuclear Science, 38(6), 1253-1258, 1991.

"Solvent Rotational Mobility in Polystyrene/Aroclor and Polybutadiene/Aroclor Solutions. II A Photon Correlation Spectroscopic Study", A. Rizos, G. Fytas, T.P. Lodge, K.L. Ngai, Journal of Chemical Physics, 95(4), 2980-2987, 1991.

"Some Connections Between Viscoelastic Properties of PVC and Plasticized PVC and Molecular Kinetics", K.L. Ngai, A.F. Yee, Journal of Polymer Science: Part B, 29, 1493-1501, 1991.

"Sputtering Synthesis and Properties of Molybdenum Nanocrystals and Al/Mo Layered Nanocomposites", G.M. Chow, A. Patnaik, T.E. Schlesinger, R.C. Cammarata, M.E. Twigg, A.S. Edelstein, J. Materials Research Soc., 6(4), 737-743, 1991.

"Structural and Magnetic Properties of Al/Fe Multilayers Deposited by Ion Beam Sputtering", S.B. Qadri, C. Kim, M. Twigg, M.Z. Harford, P. Lubitz, Surface and Coatings Technology, 49, 139-142, 1991.

"Structural and Magnetic Properties of Ion Beam Sputtered Deposited Cu/Fe Multilayers", S.B. Qadri, C. Kim, P. Lubitz, M. Twigg, Journal Vac. Sci. Technology, A9(3), 430-433, 1991.

"Studies of Donor States in Si-Doped Al<sub>11</sub>Ga<sub>1-x</sub>As Using Optically Detected Magnetic Resonance with Uniaxial Stress", E.R. Glaser, T.A. Kennedy, Semicond. Sci Technology, 6, B97-B100, 1991.

"Sub-30 nm Lithography in a Negative Electron Beam Resist with a Vacuum Scanning Tunneling Microscope", E.A. Dobisz, C.R.K. Marrian, Appl. Phys. Lett., 58(22), 2526-2528, 1991.

"Superconductivity in Layered Materials. Pairing theory for Projectively Translation Invariant States", P.P. Divakaran, A.K. Rajagopal, Physica C, 176, 457-476, 1991.



"Surface Characterization of Multilayer X-Ray Diffraction Specimens", P.G. Burkholter, D.B. Brown, J.V. Gilfrich, J.H. Konnert, P. D'Antonio, H. Rosenstock, L.M. Shirey, M. Thompson, V. Eilings, J. Vac. Sci. Technology, B9(2), 845-852, 1991.

"Surface Geometry of BaO on W(100): A Surface-Extended X-Ray-Absorption Fine-Structure Study", A. Shih, C. Hor, W. Elam, J. Kirkland, D. Mueller, Physical Review B, 44(11), 5815-5826, 1991.

"Synthesis and Structural Properties of Ion-beam Sputtered Cu/Ni Multilayers", C. Kim, S.B. Qadri, M. Twigg, A.S. Edelstein, Journal Vac. Sci. Tech, A8(4), 3466-3469, 1991.

"Temperature Dependence of the Stretched Exponent in Structural Relaxation of Fragile Glass-Forming Molecular Liquids", K.L. Ngai, Journal of Non-Crystalline Solids, 131-133, 80-83, 1991.

"Test of Expected Correlation of Polymer Segmental Chain Dynamics with Temperature-Dependent Time-Scale Shifts in Concentrated Solutions", K.L. Ngai, Macromolecules, 24(17), 4865 - 4867, 1991.

"The High Temperature Superconductivity Space Experiment", D.C. Webb, M. Nisenoff, Microwave Journal, 34(9), 85-91, 1991.

"The Nucleation and Growth of Germanium on (1102) Sapphire Deposited by Molecular-Beam Epitaxy", D.J. Godbey, M.E. Twigg, J. Appl. Phys., 69(8), 4216, 1991.

"The Numerical Simulation of Particle Trajectories in Quantum Transport and the Effects of Scattering and Self-Consistency on the Performance of Quantum Well Devices", K.L. Jensen, F.A. Buot, IEDM, 771-774, 1991.

"The Study of Relaxation in Asymmetrically Strained Si<sub>1-x</sub>Gex/Si Superlattices", S.M. Prokes, O.J. Glembocki, M.E. Twigg, K.L. Wang, Journal of Electronic Materials, 20(5), 389-394, 1991.

"The Symmetric and Fully Distributed Solution to a Generalized Dining Philosophers Problem: An Analogue of the Coupling Theory of Relaxations in Complex Correlated Systems", K.L. Ngai, R.W. Rendell, Relaxation in Complex Systems and Related Topics, Campbell and Giovannella, eds., (Plenum Press), 309-316, 1991.

"Theoretical Aspects of Coupling Model Schemes of Slow Relaxation in Complex Correlated Systems", A.K. Rajagopal, K.L. Ngai, S. Teitler, Journal of Non-Crystalline Solids, 131-133, 282-288, 1991.

"Time Dependence of Radiation-Induced Interface Trap Formation in Metal-Oxide-Semiconductor Devices as a Function of Oxide Thickness and Applied Field", D.B. Brown, N.S. Saks, J. Appl. Phys., 70(7), 3734-3747, 1991.

"Toward a Theory of Relaxation in Correlated Systems: Diffusion in the Phase Space of a Chaotic Hamiltonian", K.L. Ngai, R.W. Rendell, Journal of Non-Crystalline Solids, 131-133, 233-237, 1991.

"Ultra-Compact Microwave Filters Using Kinetic Inductance Microstrip", J.M. Pond, K.R. Carroll, E.J. Cukauskas, IEEE Trans. on Magnetics, 27(2), 2696-2699, 1991.

"Uncommon Nuclear-Spin Relaxation in Fluorozirconate Glasses at Low Temperatures", S. Estalji, O. Kanert, J. Steinert, H. Jain, K.L. Ngai, Physical Review B, 43(10), 7481-7486, 1991.

"Volume-Dependent Rate Processes Predicted by the Coupling Model", R.W. Rendell, K.L. Ngai, D.J. Plazek, J. Non-Crystalline Solids, North Holland, 131-133, 442-450, 1991.

"X-Ray Rocking Curve Measurement of Composition and Strain in Si-Ge Buffer Layers grown on Substrates", M. Fatemi, R.E. Stahlbush, Applied Physics Letters, 58(8), 825 - 827, 1991.

"NIKE - Pulseline and Diode Design for the 60 cm Amplifier", P.A. Corcoran, I.D. Smith, R.G. Altes, M. J. Christensen, B. D. Chugg, M.W. McGeoch, J.D. Sethian, S.P. Obenschain, R. L. Morse, Proceedings of 8th IEEE International Pulsed Power Conference, K. Prestwich, R. White, eds., p. 934, 1991.\*

"Large Electron Accelerators Powered by Intense Relativistic Electron Beams", M. Friedman, V. Serlin, Y.Y. Lau, J. Krall, Proceedings of Intense Microwave and Particle Beams II, SPIE, 1407, 474, 1991.\*

"Relativistic Klystron Amplifier I - High Power Operation", M. Friedman, V. Serlin, Y.Y. Lau, J. Krall, Proceedings of Intense Microwave and Particle Beams II, SPIE, 1407, 8, 1991.\*

"Relativistic Klystron Amplifier II: High Frequency Operation", V. Serlin, M. Friedman, Y.Y. Lau, J. Krall, Proceedings of Intense Microwave and Particle Beams II, SPIE, 1407, 2, 1991.\*

"Evolution of a Deuterium Fiber Z-Pinch Driven by a Long Current Pulse", J. D. Sethian, A. E. Robson, K. A. Gerber, A. W. Desilva, Proceedings of the Workshop on Physics of Alternative Magnetic Confinement Schemes, S. Ortolani and E. Sindoni, eds. p. 511, 1991.\*

"IFR Cell Radius Tailoring on SuperIBEX", J. Antoniadis, M. Myers, D. Murphy, T. Peyser, R. Hubbard, R. Fernsler, R. Pechacek, R. Meger, Proceedings of the 8th IEEE Pulsed Power Conference, p. 582, 1991.\*

"Relativistic Electron Beam Tracking of Reduced Density Channels in Normal Density Air", D. Murphy, R. Pechacek, J. Antoniadis, T. Peyser, M. Myers, R. Fernsler, R. Hubbard, R. Meger, Proceedings of the 8th IEEE Pulsed Power Conference, p. 589, 1991.\*

"High Current Relativistic Electron Beam Propagation in High Neutral Pressure Environments", J. Antoniadis, M. Myers, D. Murphy, R. Hubbard, T. Peyser, R. Pechacek, R. Meger, Proceedings of the 8th IEEE Pulsed Power Conference, p. 585, 1991.\*

"Schlieren Observations of Density Channels in MPPE", G. Guethlein, R. Pechacek, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 199, 1991.\*

"Overview of the NRL CPB Experimental Program", R. A. Meger, J. A. Antoniadis, D. P. Murphy, M. C. Myers, R. E. Pechacek, T. A. Peyser, J. Santos, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 207, 1991.\*

"SuperIBEX Diagnostics: Faraday Collector and Optical Measurements", T. A. Peyser, J. A. Antoniadis, M. C. Myers, R. E. Pechacek, D. P. Murphy, R. A. Meger, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 211, 1991.\*

"Lead Pulse Propagation and Stability Experiments on SuperIBEX", D. Murphy, J. Antoniadis, R. Meger, M. Myers, R. Pechacek, T. Peyser, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 215, 1991.\*

"SuperIBEX Beam Current Diagnostics", R. E. Pechacek, D. P. Murphy, T. Peyser, M. Myers, J. Antoniadis, R. A. Meger, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 221, 1991.\*

"BEAST: A Microcomputer Based Electron Beam Propagation Code", J. A. Antoniadis, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 229, 1991.\*

"Beam Conditioning Experiments on SuperIBEX", T. A. Peyser, J. A. Antoniadis, M. C. Myers, R. E. Pechacek, D. P. Murphy, R. A. Meger, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 251, 1991.\*

"Neutral Gas Filled Cells for the Transport and Centering of High Current Electron Beams", M. C. Myers, J. A. Antoniadis, R. A. Meger, D. P. Murphy, R. E. Pechacek, T. A. Peyser Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 255, 1991.\*

"Physics of a Dense Z-Pinch Fusion Reactor", A.E. Robson, Proceedings of the Workshop on Physics of Alternative Magnetic Confinement Schemes, S. Ortolani and E. Sindoni, eds., p. 595, 1991.\*

"Non-Ideal MHD Effects on the Evolution of Dense Z-Pinch Plasmas", F.L. Cochran, A.E. Robson, Proceedings of the Workshop on Physics of Alternative Magnetic Confinement Schemes, S. Ortolani, E. Sindoni, eds., p. 395, 1991.\*

"Vacuum Insulator Flashover Measurements for Microsecond Pulses", J.R. Boller, P.J. Goodrich, J.D. Shipman, Jr., S.J. Stephanakis, R.J. Comisso, Proceedings of the 8th IEEE Pulsed Power Conference, p. 893., 1991.\*

"Plasma Opening Switch Experiments on Hawk with an E-Beam Diode Load", P.J. Goodrich, J.R. Boller, R.J. Comisso, D.D. Hinshelwood, J.C. Kellogg, B.V. Weber, Proceedings of the 8th IEEE Pulsed Power Conference, p. 515, 1991.\*

"Micro-Structuring Due to Velocity Shear and Associated Electron Heating", K.I. Nishikawa, C.K. Goertz, G. Ganguli, P.J. Palmadesso, Y.C. Lee, Proceedings of the 4th International School for Space Simulation, p. 222, 1991.\*

"Recent Studies of Collisionally Excited X-ray Lasers at NRL", E.A. McLean, J.A. Stamper, C.A. Brown, C.K. Manka, H.R. Griem, J.C. Rife, B.H. Ripin, Proceedings of the International Colloquium on X-ray Lasers, p. 339, 1991.\*

"Beam Divergence From Sharp Emitters in a General Longitudinal Magnetic Field", Y.Y. Lau, D.G. Colombant, Proceedings of the Short-Wavelength Radiation Sources Conference, p. 182, 1991.\*

"Gas Puff Z-Pinch X-Ray Source - A New Approach", A. Fisher, Proceedings of the Short-Wavelength Radiation Sources Conference SPIE, 1552, p. 252, 1991.\*

"Harmonic Generation by an Intense Picosecond Laser in an Underdense Plasma", X. Liu, J.S. Coe, C.Y. Chien, D. Umstadter, E. Esarey, P. Sprangle, Proceedings of the Short-Wavelength Coherent Radiation Fifth Topical Meeting, p. 7, 1991.\*

"Simulated Relativistic Harmonic Generation from Intense Laser Interactions with Beams and Plasmas", P. Sprangle, E. Esarey, Proceedings of the Short-Wavelength Radiation Sources Conference, SPIE, 1552, p. 147, 1991.\*

"Simulation of Free Electron Lasers in the Presence of Measured Magnetic Field Errors of the Undulator", W.P. Marable, C.M. Tang, E. Esarey, Proceedings of the Short-Wavelength Radiation Sources Conference, SPIE, 1552, p. 80, 1991.\*

"Beam Divergence From Sharp Emitters in a General Longitudinal Magnetic Field", Y.Y. Lau, D.G. Colombant, M.D. Pilloff, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 635, 1991.\*

"Nonlinear Wakefield Generation and Relativistic Optical Guiding of Intense Laser Pulses in Plasmas", E. Esarey, P. Sprangle, A. Ting, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 407, 1991.\*

"Quantum Extension of Child-Langmuir Law", Y.Y. Lau, D. Chernin, D.G. Colombant P.T. Ho, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 546, 1991.\*

"Recent Developments on the NRL Modified Betatron Accelerator", J. Golden, L.K. Len, T.J. Smith, D. Dialetis, S.J. Marsh, K. Smith, J. Mathew, P. Loschialpo, L. Seto, J.H. Chang, C.A. Kapetanacos, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE 1407, p. 418, 1991.\*

"Reduction of Beam Breakup Growth by Cavity Cross-Couplings in Recirculating Accelerators", D. Colombant, Y.Y. Lau, D. Chernin, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 484, 1991.\*

"Relativistic Klystron Amplifiers III: Dynamical Limiting Currents, Nonlinear Beam Loading and Conversion Efficiency", D.G. Colombant, Y.Y. Lau, M. Friedman, J. Krall, V. Serlin, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 13, 1991.\*

"Relativistic Klystron Amplifier IV: Simulation Studies of a Coaxial-Geometry RKA", J. Krall, M. Friedman, Y.Y. Lau, V. Serlin, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 23, 1991.\*

"Some Issues on Beam Breakup in Linear Accelerators", Y.Y. Lau, D.G. Colombant, Proceedings of the Intense Microwave and Particle Beams II Conference, SPIE, 1407, p. 479, 1991.\*

"Reduction of Beam Breakup Growth by Bleeding Cavities in Linear Accelerators", D.G. Colombant, Y.Y. Lau, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 1609, 1991.\*

"Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System", C. Tang, J. Krall, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 1788, 1991.\*

"Efficiency and Frequency Stability in a High Power Microwave Gap", Y.Y. Lau, D.G. Colombant, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 637, 1991.\*

"3d and r.z Particle Simulation of Beams for Heavy Ion Fusion: the WARP Code", A. Friedman, D.P. Grote, D.A. Callahan, A.B. Langdon, I. Haber, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 263, 1991.\*

"Beam Dynamics in the Spiral Line Induction Accelerator", S. Slinker, J. Krall, M. Lampe, G. Joyce, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 242, 1991.\*

"Observation of Plasma Wakefield Effects During High- Current Relativistic Beam Transport", J.D. Miller, R.F. Schneider, K.T. Nguyen, G. Joyce, D.J. Weidman, J. Goldhar, H.S. Uhm, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 239, 1991.\*

"Vlasov-Maxwell Simulations of Nonlinear Plasma Dynamics in the Plasma Wakefield Accelerator", J. Krall, G. Joyce, E. Esarey, Proceedings of the 1991 IEEE Particle Accelerator Conference, p. 2563, 1991.\*

"Reduction of BBU Growth by Cavity Cross-Coupling in SLIA", D. Colombant, Y.Y. Lau, D. Chernin, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 21, 1991.\*

"Beam Transport and Matching in the SLIA", M. Lampe, J. Krall, S.P. Slinker, G. Joyce, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 33, 1991.\*

"The Impact of the Three-Wave Instability on the Spiral Line Induction Accelerator", J. Krall, C.M. Tang, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 37, 1991.\*

"Ion-Focused Beam Transport in the Recirculating Linear Accelerator (RKA)", S.P. Slinker, R.F. Hubbard, G. Joyce, R.F. Fernsler, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 63, 1991.\*

"Plasma Wakefield Experiment Progress", R.F. Schneider, J.D. Miller, D.J. Weidman, J. Goldhar, M.J. Rhee, K.W. Struve, G. Joyce, K.T. Nguyen, H.S. Uhm, Proceedings of the 1990 DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 141, 1991.\*

"Numerical Simulation of the NSWC Wakefield Experiments", G. Joyce, H.S. Uhm, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 145, 1991.\*

"Energy Exchange Between Beam Segments by Wakefield Effects", H.S. Uhm, G. Joyce, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 149, 1991.\*

"Propagation Physics Retrospective and Perspective", M. Lampe, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 163, 1991.\*

"Objectives and Configuration of the Multiple Pulse Propagation Experiment", G.J. Caporaso, F.W. Chamber, Y.P. Chong, F.J. Deadrick, G. Guethlein, W.M. Fawley, V.L. Renbarger, D. Rogers, Jr., J.T. Weir, D. Eckstrom, R. Hubbard, P. Lee, K. Stalder, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 173, 1991.\*

"MPPE Results", Frank W. Chambers, G.J. Caporaso, Y.P. Chong, F.J. Deadrick, G. Guethlein, W.M. Fawley, T.J. Orzechowski, V.L. Renbarger, D. Rogers, Jr., J.T. Weir, P. Lee, K.W. Struve, R. Hubbard, L. Feinstein, D. Keeley, D. Eckstrom, K. Stalder, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 177, 1991.\*

"Analysis of ATA/MPPE", R.F. Hubbard, S.P. Slinker, M. Lampe, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 183, 1991.\*

"Simulation of ATA Channel Formation in the MPPE", S.P. Slinker, R.F. Hubbard, R.F. Fernsler, M. Lampe, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 203, 1991.\*

"High Current Propagation Studies", R.F. Hubbard, S.P. Slinker, R.F. Fernsler, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 225, 1991.\*

"Further Reflections on Ground-Plane Deflection", R.F. Fernsler, M. Lampe, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 233, 1991.

"Streamer Modeling", R.F. Fernsler, S.P. Slinker, R.D. Taylor, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 247, 1991.\*

"Beam Conditioning Techniques", R.F. Fernsler, R.F. Hubbard, S.P. Slinker, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 261, 1991.\*

"Transport and Tailoring of Relativistic Electron Beams with Collapsing Ion Channels", M. Lampe, S.P. Slinker, Proceedings of the DARPA/SDIO/Services Annual Charged Particle Beam Review, p. 265, 1991.\*

"1 MV Long Pulse Generator with Low Ripple and Low Droop", N.C. Jaitly, M. Coleman, S. Eckhouse, A. Ramrus, S.H. Gold, R.B. McCowan, C.A. Sullivan, Proceedings of the 8th IEEE International Pulsed Power Conference, p. 161, 1991.\*

"Development of Efficient High Power Millimeter-Wave Sources for Space Power Beaming", A.W. Fliflet, S.H. Gold, W.M. Manheimer, Proceedings of the Power Beaming Workshop, p. T11.1, 1991.\*

"Design of a High Perveance Field-Immersed Magnicon", S.H. Gold, B. Hafizi, W.M. Manheimer, C.A. Sullivan, Proceedings of the Sixteenth International Conference on Infrared and Millimeter Waves, p. 4, 1991.\*

"Multimode Simulation of High Frequency Gyrotrons", S.H. Gold, A.W. Fliflet, Proceedings of the Sixteenth International Conference on Infrared and Millimeter Waves, p. 53, 1991.\*

"On the Comparison Between Josephson-Junction Array Variations", K.Y. Tsang, K. Wiesenfeld, Journal of Applied Physics, 70, 1075, 1991 .

"Role of the Implosion Kinetic Energy in Determining the Kilovolt X-ray Emission From Aluminum Wire Array Implosions", C. Deeney, T. Nash, R. R. Prasad, L. Warren, K. G. Whitney, J. W. Thornhill, and M. C. Coulter, Physical Review A, 44, 10, 1991.

"Leakage Currents Outside an Imploding Z Pinch", R. E. Terry, N. R. Pereira, Physics of Fluids B, 3, 195, 1991.

"Achievable Pump Power and Gain in the AlXI - MgIX Photoresonant X-ray Laser", J. P. Apruzese, M. Buie, Journal of Applied Physics, 70, 1957, 1991.

"K-shell X-ray Emission From Sodium Wire Array Implosions as the Pump for the Sodium-Neon X-ray Laser Scheme", C. Deeney, T. Nash, R. R. Prasad, L. Warren, and J. P. Apruzese, Applied Physics Letters, 58, 1021, 1991.

"Overlapped Stark Profiles of Coincident X-ray Lines as Possible Diagnostics of Core-shell Mixing in Spherical Plasma Implosions", J. P. Apruzese, P. C. Kepple, Physical Review A, 43, 6964, 1991.

"Review on Spontaneous Magnetic Field in Laser-Produced Plasmas Phenomena and Measurements", J.A. Stamper, Laser and Particle Beams, 9 (3), 841, 1991.

"Measurement of Plasma Opacity from Laser-Produced Optically Thin Strongly Coupled Plasmas", A.N. Mostovych, K.J., Kearney, J.A., Stamper, A. J., Schmitt, Physical Review Letters, 66, 612, 1991.

"A Passive Method to Trap an Electron Beam in a Stellatron Accelerator", A.V. Deniz, Journal of Applied Physics, 69, 3, 1151, 1991.

"Three-Dimensional Filamentation of Light in Laser Plasmas", A.J. Schmitt, Physics of Fluids B, 3, 186, 1991.

"The Effect of Induced Spatial Incoherence on the Absolute Raman Instability", P.N. Guzdar, W. Tan, Y.C. Lee, C.S. Liu, R.H. Lehmberg, Physics of Fluids B, 3, 776, 1991.

"The Effect of Bandwidth on the Connective Raman Instability in Inhomogeneous Plasmas", P.N. Guzdar, C.S. Liu, R.H. Lehmberg, Physics of Fluids B, 3, 2882, 1991.

"Increased X-Ray Conversion Efficiency from Gold Plasmas Irradiated With Spatially and Temporally Incoherent Light", D.R. Kania, W.L. Kruer, P. Bell, S.P. Obenschain, K. Kearney, A Mostovych, Physics of Fluids B, 6, 1496, 1991.

"A Segmented Concentric Faraday Cup for Measurement of Time-Dependent Relativistic Electron Beam Profiles", T. A. Peyser, J. A. Antoniadis, M. C. Myers, M. Lampe, R. E. Pechacek, D. P. Murphy, R. A. Meger, Review of Scientific Instruments, 62 (12), 2895, 1991.

"Reduction of  $3\sigma/2$  Emission From Laser-Produced Plasmas with Broad Bandwidth. Induced Spatial Incoherence at 0.53 mm", T. A. Peyser, C. K. Manka, S. P. Obenschain, K. J. Kearney, Physics of Fluids B, 3 (6), 1479, 1991.

"The Dense Z-Pinch: An Alternative Approach to Fusion", J. D. Sethian, A. E. Robson, Journal of Fusion Energy, 10 (4), 329, 1991.

"Neutron Production in Dense X-Pinch Plasmas Produced From Deuterated Polyethylene Fibers", K. C. Mittal, D. H. Kalantar, N. Qi, D. A. Hammer, K. A. Gerber, J. D. Sethian Journal of Applied Physics, 70 (11), 6712, 1991.

"Plasma Reflectors for Electronic Beam Steering in Radar Systems", W.M. Manheimer, IEEE Transactions on Plasma Science, 19, 1228, 1991.

"Lower-Hybrid- Drift Instability and Radiative Collapse of a Dense Z-Pinch", A.E. Robson, Physics of Fluids B, 3, 1461, 1991.

"A Small Fusion Reactor Based on the Dense Z-Pinch", A.E. Robson, Fusion Technology, 20, 858, 1991.

"Wire-Guided Transport of Intense Ion Beams", J.J. Watrous, D. Mosher, J.M. Neri, P.F. Ottinger, C.L. Olson, J.T. Crow, R.R. Peterson, Journal of Applied Physics, 69, 639, 1991.

- "Investigation of Plasma Opening Switch Conduction and Opening Mechanisms", B.V. Weber, R.J. Commisso, P.J. Goodrich, J.M. Grossmann, D.D. Hinshelwood, J.C. Kellogg, P.F. Ottinger, IEEE Transactions on Plasma Science, 19, 757, 1991.
- "Implosions of NaF Plasmas for Photopumping a Na-Ne X-ray Laser", F.C. Young, D.D. Hinshelwood, J.P. Apruzese, C. Deeney, T. Nash, R.R. Prasad, Journal of Applied Physics, 69, 7520, 1991.
- "Triggered Vacuum Flashover Switch for High-Power Applications", J.C. Kellogg, J.R. Boller, R.J. Commisso, D.J. Jenkins, R.D. Ford, J.D. Shipman, W.H. Lupton, Review of Scientific Instruments, 62, 2689, 1991.
- "Z-Discharge Transport of Intense Ion Beams for Inertial Confinement Fusion", P.F. Ottinger, D.V. Rose, D. Mosher, J.M. Neri, Journal of Applied Physics, 70, 5292, 1991.
- "Absorption at the Ion-Ion Hybrid Resonance in the Presence of Incoherent Density Fluctuations", H. Romero, G.J. Morales, Physics of Fluids B, 3 (11), 2960, 1991.
- "Analysis of Standing Wave Patterns in VLF Transmitter Signals: Effects of Sporadic E Layers and In-situ Measurements of Low Electron Densities", C.L. Siefring, M.C. Kelley, Journal of Geophysical Research, 96, 17826, 1991.
- "Observation of High-Pressure Blast Wave Decursors", J. Grun, J. Stamper, C. Manka, J. Resnick, R. Burris, B.H. Ripin, Applied Physics Letters, 59, 246, 1991.
- "Differential Memory in the Earth's Magnetotail", G.R. Burkhart, J. Chen, Journal of Geophysical Research, 96, 14033, 1991.
- "Effects of Collisions on the Nonlinear Particle Dynamics in the Magnetotail", D.L. Holland, J. Chen, Geophysical Research Letters, 18 (8), 1579, 1991.
- "Excitation of Artificial Airglow by High Power Radio Waves from the "Sura" Ionospheric Heating Facility", P.A. Bernhardt, W.A. Scales, S.M. Grach, A.N. Keroshtin, D.S. Kotik, S.V. Polyakov, Geophysical Research Letters, 18 (8), 1477, 1991.
- "Existence of Quasihelically Symmetric Stellarators", D.A. Garren, A.H. Boozer, Physics of Fluids B, 3 (10), 2822, 1991.
- "Field-Aligned Dynamics of Chemically Induced Perturbations to the Ionosphere", P.A. Bernhardt, P. Rodriguez, C.L. Siefring, Journal of Geophysical Research, 96 (A8), 13887, 1991.
- "Harmonic  $H^{\pm}$  Gyrofrequency Structures in Auroral Hiss Observed by High-Altitude Auroral Sounding Rockets", P.M. Kintner, W. Scales, J. Vago, A. Yau, B. Whalen, R. Arnoldy, T. Moore, Journal of Geophysical Research, 96 (A6), 9627, 1991.
- "Instability of Taylor-Sedov Blast Waves Propagating Through a Uniform Gas", J. Grun, J. Stamper, C. Manka, J. Resnick, R. Burris, J. Crawford, B.H. Ripin, Physical Review Letters, 66 (21), 2738, 1991.
- "Low-Frequency Oscillations Associated with a Polar Cap Auroral Arc: Local Spectral Density Estimation", D.N. Walker, P.K. Chaturvedi, M. Singh, P. Rodriguez, C.L. Siefring, M.M. Baumbach, Journal of Geophysical Research, 96 (A3), 3589, 1991.



"Magnetic Field Strength of Toroidal Plasma Equilibria", D.A. Garren, A.H. Boozer, Physics of Fluids B, 3 (10), 2805, 1991.

"Reconnection Voltage as a Function of IMF Clock Angle", J.A. Fedder, C.M. Mobarry, J.G. Lyon, Geophysical Research Letters, 18 (6), 1047, 1991.

"Simulation of High-Speed (Orbital) Releases of Electron Attachment Materials in the Ionosphere", W.A. Scales, P.A. Bernhardt, Journal of Geophysical Research, 96 (A8), 13815, 1991.

"Soft X-ray Continuum from Laser-Irradiated High-Z Targets", G. Mehlman, P.G. Burkhalter, D.A. Newman, B.H. Ripin, Journal of Quantitative Spectroscopy Radiation Transfer, 45 (4), 225, 1991.

"Structure of the Dissipation Region During Magnetic Reconnection in Collisionless Plasma", G.R. Burkhart, J.F. Drake, J. Chen, Journal of Geophysical Research, 96 (A7), 11539, 1991.

"Theory and Simulation of a High-Frequency Magnetic Drift Wave", J.D. Huba, Physics of Fluids B, 3 (12), 3217, 1991.

"The Autonomous Chaotic Relaxation Oscillator: An Electrical Analogue to the Dripping Faucet", P.A. Bernhardt, Physica D, 52, 489, 1991.

"A Solvable Self-Similar Model of the Sausage Instability in a Resistive Z Pinch", M. Lampe, Physics of Fluids B, 3 (7), 1521, 1991.

"Beam Divergence from Sharp Emitters in a General Longitudinal Magnetic Field", Y.Y. Lau, D.G. Colombant, M.D. Pilloff, Journal of Applied Physics, 70 (1), 4, 1991.

"Beam Trapping in a Modified Betatron Accelerator", C.A. Kapetanacos, D. Dialetis, S.J. Marsh, L.K. Len, T. Smith, Physical Review A, 44, 3900, 1991.

"Cold Tests of Quasi-Optical Gyrotron Resonators", R.P. Fischer, T.A. Hargreaves, A.W. Fliflet, IEEE Transactions on Microwave Theory and Techniques, 39, 1010, 1991.

"Comment on Nondiffracting Beams", P. Sprangle, B. Hafizi, Physical Review Letters, 66, 837, 1991.

"Compact High-Current Accelerators and Their Prospective Applications", C.A. Kapetanacos, L.K. Len, T. Smith, D. Dialetis, S.J. Marsh, P. Loschialpo, J. Golden, J. Mathew, J.H. Chang, Physics of Fluids B, 3 (8), 2396, 1991.

"Critique of Nondiffracting Beams", B. Hafizi, P. Sprangle, Comments on Plasma Physics and Controlled Fusion, 14, 297, 1991.

"Deflection of Electron Beams by Ground Planes", R.F. Fernsler, M. Lampe, Physics of Fluids B, 3 (11), 3177, 1991.

"Depressed Collector Experiments on a Quasioptical Gyrotron", T.A. Hargreaves, A.W. Fliflet, R.P. Fischer, M.L. Barsanti, Physics of Fluids B, 3 (11), 3171, 1991.

"Diffraction Effects in Directed Radiation Beams", B. Hafizi, P. Sprangle, Journal of Optical Society of America A, 8, 705, 1991.

- "Diffusion of Magnetic Fields in a Toroidal Conducting Shell of Circular Cross Section", D. Dialetis, L.K. Len, J. Golden, C.A. Kapetanacos, Journal of Applied Physics, 69 (4), 1813, 1991.
- "Electron-Hose Instability in the Ion-Focused Regime", D.H. Whittum, W.M. Sharp, S.S. Yu, M. Lampe, G. Joyce, Physical Review Letters, 67, 991, 1991.
- "Elimination of Laser Prepulse by Relativistic Guiding in a Plasma", P. Sprangle, A. Zigler, E. Esarey, Applied Physics Letters, 58 (4), 346, 1991.
- "Evolution of a Finite Pulse of Radiation in a High-Power Free-Electron Laser", A. Ting, B. Hafizi, P. Sprangle, C. M. Tang, IEEE Journal of Quantum Electronics, 27, 2529, 1991.
- "Experimental, Theoretical, and Numerical Investigation of the Homogenization of Density Nonuniformities in the Periodic Transport of a Space-Charge Dominated Beam", I. Haber, D. Kehne, M. Reiser, H. Rudd, Physical Review A, 44, 5194, 1991.
- "Frequency Up-Shifting of Laser Pulses by Copropagating Ionization Fronts", E. Esarey, G. Joyce, P. Sprangle, Physical Review A, 44, 3908, 1991.
- "High-Voltage Millimeter-Wave Gyro-Traveling-Wave Amplifier", S.H. Gold, D.A. Kirkpatrick, A.W. Fliflet, R.B. McCowan, A.K. Kinkead, D.L. Hardesty, M. Sucey, Journal of Applied Physics, 69 (9), 6696, 1991.
- "Kinetic Stabilization of Interchange Modes in an Axisymmetric Mirror by Large Orbit Radius Thermal Ions", J. Krall, C.E. Seyler, R.N. Sudan, Physics of Fluids B, 3 (4), 1015, 1991.
- "Octupole Correction of Geometric Aberrations for High-Current Heavy-Ion Beams", D.D. M. Ho, I. Haber, K.R. Crandall, S.T. Brandon, Particle Accelerators, 36, 141, 1991.
- "Ohmic Effects in Quasioptical Resonators", T.A. Hargreaves, R.P. Fischer, R.B. McCowan, A.W. Fliflet, International Journal of Infrared and Millimeter Waves, 12, 9, 1991.
- "Output Switch for a Megavolt Electron Beam Generator", J. Mathew, J. Golden, Review of Scientific Instruments, 62 (6), 1514, 1991.
- "Patterning Tungsten Films with an Electron Beam Lithography System at 50 keV for X-ray Mask Applications", K.W. Rhee, A.C. Ting, L.M. Shirey, K.W. Foster, J.M. Andrews, M.C. Peckerar, Y.C. Ku, Journal of Vacuum Science Technology B, 9 (6), 3292, 1991.
- "Quantum Extension of Child-Langmuir Law", Y.Y. Lau, D. Chernin, D.G. Colombant, P.T. Ho, Physical Review Letters, 66, 1446, 1991.
- "Recent Advances in Free Electron Laser Theory", C.M. Tang, Nuclear Instruments and Methods A, 304, 526, 1991.
- "Reduction of Beam Breakup Growth by Cavity Cross-Couplings in Recirculating Accelerators", D. Colombant, Y.Y. Lau, D. Chernin, Particle Accelerators, 35, 193, 1991.
- "Simulation of Free-Electron Lasers in the Presence of Correlated Magnetic Field Errors", W.P. Marable, C. Tang, E. Esarey, IEEE Journal of Quantum Electronics, 27, 2693, 1991.
- "Stability Regimes in a Helical Quadrupole Focusing Accelerator - Theory and Simulation", J. Krall, C.M. Tang, G. Joyce, P. Sprangle, Physics of Fluids B, 3 (1), 204, 1991.

"Status Report on the NIST-NRL Free Electron Laser", P.H. Debenham, R.L. Ayres, W.A. Cassatt, B.C. Johnson, R.G. Johnson, E.R. Lindstrom, P.J. Liposky, A.B. Marella, D.L. Mohr, J.K. Whittaker, N. D. Wilkin, M.A.D. Wilson, C. Tang, P. Sprangle, S. Penner, Nuclear Instruments and Methods A, 304, 208, 1991.

"Stimulated Backscattered Harmonic Generation from Intense Laser Interactions with Beams and Plasmas", P. Sprangle, E. Esarey, Physical Review Letters, 67, 2021, 1991.

"Studies of Synchrotron Radiation Emission from the Modified Betatron Accelerator", T.J. Smith, J. Golden, C.A. Kapetanakos, Journal of Applied Physics, 69 (10), 6836, 1991.

"The Effects of Field Errors on Low-Gain Free-Electron Lasers", E. Esarey, C. Tang, W.P. Marable, IEEE Journal of Quantum Electronics, 27, 2682, 1991.

"Theoretical Analysis of Radiation Pulses in the NIST/NRL FEL Oscillator", C.M. Tang, B. Hafizi, Nuclear Instruments and Methods A, 304, 497, 1991.

"Theoretical Consequences of Wiggler Field Error Reduction Techniques on Free-Electron Laser Performance", W.P. Marable, E. Esarey, C.M. Tang, Physics of Fluids B, 3 (3), 781, 1991.

"Theory of Electron-Beam Tracking in Reduced-Density Channels", R.F. Fernsler, S.P. Slinker, R.F. Hubbard, Physics of Fluids B, 3 (9), 2696, 1991.

"Theory of Wake-Field Effects of a Relativistic Electron Beam Propagating in a Plasma", H.S. Uhm, G. Joyce, Physics of Fluids B, 3 (7), 1587, 1991.

"Time-Dependent Multimode Simulation of Gyrotron Oscillators", A.W. Fliflet, R.C. Lee, S.H. Gold, W.M. Manheimer, E. Ott, Physical Review A, 43, 11, 6166, 1991.

"Vlasov Simulations of Very-Large-Amplitude-Wave Generation in the Plasma Wake-Field Accelerator", J. Krall, G. Joyce, E. Esarey, Physical Review A, 44, 6854, 1991.

"Automated Detection and Localization of a Broadband Target in a Constrained Underwater Environment", K.D. Flowers, E.D. Kunz, and A.A. Gerlach, U.S. Naval Journal of Underwater Acoustics, 41(4), October 1991.

"Acoustic Tomography Via Matched Field Processing", A. Tolstoy, O. Diachok, and L.N. Frazer, J. Acoust. Soc. Am. 89 (3) p.1119-1127, 1991.

"Broadband Fiber Optic Planar Acoustic Sensors", Journal of Underwater Acoustics, B. H. Houston, N. Lagakos, and A. Dandridge, January 1991.

"The Effect Of Irregularity On The Scattering Of Sound From A Ribbed Plate", D. M. Photiadis, J. Acoust. Soc. Am., 90, p. 1188, August 2, 1991.

"High Frequency Response of Fiber-Optic Planar Acoustic Sensors", J. A. Bucaro, N. Lagakos, B. H. Houston, and A. Dandridge, Journal of Lightwave Technology, Vol. 9, No. 9, September 1991.

"Order-Adaptive Solution of the Acousto-Elastic Scattering Problem", James Grannell, Joseph Shirron, Luise Schuetz-Couchman, NCA-Vol. 12/AMD-Vol. 128, Structural Acoustics, ASME 1991.

"Form Function Dependence on Rigidity and Mass", Charles F. Gaumont, and Louis R. Dragonette, J. Acoust. Soc. Am. 90 (5), 2692-2696, 1991.

"Acoustic Radiation From Finite Structures." A. Sarkissian, J. Acoust. Soc. Am. 90, 574-578, 1991.

"The Effect Of Wall Elasticity On The Properties Of A Helmholtz Resonator," D. M. Photiadis, J. Acoust. Soc. Am. 90, p.1188, 2, Aug 1991.

"Structural Intensity in Thin Cylindrical Shells," Earl G. Williams, J. Acoust. Soc. Am., 89, 1615-1622 1991.

"Time Domain Analysis of the Energy Exchange Between Structural Vibrations and Acoustic Radiation using Nearfield Acoustical Holography Measurements," J. Adin Mann, III, Earl G. Williams, Karl Washburn, and Karl Grosh, J. Acoust. Soc. Am., 90 1656-1664 1991.

"Fiber Optic Air Backed Hydrophone Transduction Mechanisms", J. A. Bucaro, B. H. Houston, and Earl G. Williams, J. Acoust. Soc. Am. Vol. 89, No. 1, January 1991.

"Rapid Computation of Acoustic Fields in Three-Dimensional Ocean Environments," W.A. Kuperman, M.B. Porter, J.S. Perkins, J. Acoust. Soc. Am.; 89(1), pp. 125-33, January 1991.

"Higher-Order Pade Approximation for Accurate and Stable Elastic Parabolic Equations with Application to Interface Wave Propagation," JM.D. Collins, Acoust. Soc. Am.; 89(3), pp. 1050-1057, March 1991.

"A Higher-Order Energy-Conserving Parabolic Equation for Range-Dependent Ocean Depth, Sound Speed, and Density," M.D. Collins, E.K. Westwood, J. Acoust. Soc. Am.; 89(3), pp. 1068-1075, March 1991.

"Receiver-Transmitter Optimization for Detection in Doubly-Spread Channels," D.M. Drumheller, D.W. Ricker, J. Acoust. Soc. Am.; 89(4), Pt. 1, pp. 1714-1723, April 1991.

"Stabilized High-Resolution Beamforming with Horizontal Arrays: Two Experimental Trials in Shallow Water," R.F. Gragg, B.H. Pasewark, Acoust. Soc. Am.; 89(2), pp. 682-690, February 1991.

"Focalization: Environmental Focusing and Source Localization," M.D. Collins, W.A. Kuperman, J. Acoust. Soc. Am.; 90(3), pp. 1410-22, September 1991.

"Perth-Bermuda Sound Propagation 1960: Adiabatic Mode Interpretation," K.D. Heaney, W.A. Kuperman, B.E. McDonald, J. Acoust. Soc. Am.; 90(5), pp. 2586-94, November 1991.

"Underwater Acoustics," W.A. Kuperman, Encyclopedia of Applied Physics, Vol. 1, pp. 293-327, 1-56081-052-1/91.

"Experimental Low-Frequency Array Measurements and Performance in a Discrete Noise Field(U)," L.B. Palmer, B.B. Adams, J. Underwater Acoustics; 41(3), July 1991. SECRET

"Application of Sound to Underwater Acoustics," M.D. Collins, J. Perkins, L. Tinker, and B.E. McDonald, J. Acoust. Soc. Am.; 89, 2001, 1991.

"Perth-Bermuda (1960): A Shot Heard Round the World According to Adiabatic Mode Theory," K.D. Heaney, W.A. Kuperman, and B.E. McDonald, J. Acoust. Soc. Am.; 89, 1896, 1991.

"Observations Of The Relative Contributions Of Water Borne And Sediment Paths To The Received Acoustic Signal," Ali, H. B. And L. D. Bibee, (Proceedings), Shear Waves In Marine Sediments, Pp. 185-193, 1991. \*

"Variability of Interstellar Hydroxyl Masers", A.W. Clegg, J.M. Cordes, ApJ, 374. 150, 1991.

"VLA and VLBI Angular Broadening Measurements: The Distribution of Interstellar Scattering at Low Galactic Latitudes", A.L. Fey, S.R. Spangler, J.M. Cordes, "ApJ 372, 132, 1991.

"Infrared Recombination Lines of Hydrogen from Young Objects in the Southern Galactic Plane" S. Beck, J. Fischer, H.A. Smith, ApJ, 383, 336, 1991.

"Infrared K-band Observations of the Gravitational Lens 2016+112", G. Langston, J. Fischer, C. Aspin, AJ, 102, 1253, 1991.

"A Spectral Study of Four Millisecond Pulsars", R.S. Foster, L. Fairhead, D.C. Backer, ApJ, 378, 687, 1991.

"NGC 7538 IRS 1: Subarcsecond Resolution Recombination Line and NH<sub>3</sub> Maser Observations", R.A. Gaume, K.J. Johnston, H. Nguyen, T. Wilson, H. Dickel, W. Goss, M. Wright, ApJ, 376, 608, 1991.

"The Dust Enshrouded Quasar in the Ultraluminous Galaxy Markarian 463: radio, Near-Infrared, and Optical Imaging", J. Mazzarella, R.A. Gaume, B. Soifer, J. Graham, G. Neugebauer, K. Matthews, AJ, 102, 1241, 1991.

"High Resolution Observations of the (9,8) Ammonia Maser Line in W51-IRS2", Wilson, R.A. Gaume, K.J. Johnston, AA, 251, L7, 1991.

"A New Look at the "Jet" in the CTB37A/B SNR Complex", N.E. Kassim, S.A. Baum, K.W. Weiler, Astrophys. J., 374, 212, 1991.

"Angular Diameter Measurements of Stars", D. Mozurkewich, K.J. Johnston, R.S. Simon, P.F. Bowers, R. Gaume, D.J. Hutter, M.M. Colavita & M. Shao, AJ, 101, 2207, 1991.

"A Radio Optical Reference Frame. II-Additional Radio and Optical Source Positions in the Northern Hemisphere", J.L. Russell, K.J. Johnston, C. Ma, D. Shaffer, C. de Veigt, AJ, 101, 2266, 1991.

"Daily Observations of Compact Radio Sources at 2.7 and 8.1 GHz: 1979-1987", E.B. Waltman, R.L. Fiedler, K.J. Johnston, J.H. Spencer, D.R. Florkowski, F.J. Josties, D.D. McCarthy, D.N. Matsakis, ApJ, 77, 379, 1991.

"Submillimeter Observations from Space: A Space Station Submillimeter Facility (SSSF)", K.W. Weiler, K.J. Johnston, R.M. Bevilacqua, P.R. Schwartz, J.P. Hackett, A.R. Raab, B.K. Dennison, W.H. Cannon, R.S. Booth, P.J. Encrenaz, A. van Ardenne, W.J. Welch, Astrophys. & Space Sci., 75 311, 1991.

"The Ten-Year Radio Light Curves for SN1979C", K.W. Weiler, S.D. Van Dyk, N. Panagia, R.A. Sramek, J.L. Discenna, Astrophys. J. 380, 161, 1991.

"Axisymmetric Models of Circumstellar Dust Shells", A.L. Collison, J.D. Fix, ApJ, 368, 545, 1991.

"Heavy, Overpressured Jets and the Radio Source Hercules A", D.L. Meier, A.C. Sadun, K.R. Lind, *ApJ*, 379, 141, 1991.

"A Molecular Gas Streamer Feeding the Galactic Center", P.T.P. Ho, L. Ho, J.C. Szczepanski, J.M. Jackson, J.T. Armstrong, *Nature*, 350, 309, 1991.

"Hydrodynamics of Ship Wake Surfactant Films." R.D. Peltzer, R.A. Skop, O.M. Griffin, J.H. Milgram, J.A.C. Kaiser and W.R. Barger, 18th ONR Symposium on Naval Hydrodynamics Proceedings, Nat. Academy Press: Washington DC, 533-552, 1991.\*

"Vortex Shedding Lock-On and Flow Control in Bluff Body Wakes." O.M. Griffin and M.S. Hall, *Transactions of the ASME, Journal of Fluids Engineering*, Vol. 113, 526-537, Dec 1991.

"Redistribution of Surface-Active Materials in a Ship Wake." R.D. Peltzer, O.M. Griffin, J.A.C. Kaiser and W. R. Barger, Symposium on Dynamics of Bubbles and Vortices Near a Free Surface (Proceedings), ASME: New York, 89-102, June 1991.\*

"Active Control of Vortex Shedding from Bluff Bodies." O.M. Griffin and M.S. Hall, *Bulletin of the American Physical Society*, Vol 36(10), 2702 1991.

"Anisotropy in a Turbulent Jet near a Free Surface." T.F. Swean, Jr, S.E. Ramberg and E.W. Miner, *ASME Journal of Fluids Engineering*, Vol. 113, No. 3, pp. 430-438, 1991.

"Examination of Wall-Damping for the  $k$  - Turbulence Model Using Direct Simulations of Turbulent Channel Flow." E.W. Miner, T.F. Swean, Jr., R.A. Handler, and R.I. Leighton, *International Journal for Numerical Methods in Fluids*, Vol. 12, No. 7, pp 609-624, April 1991.

"Splitting of Channeling-radiation Peaks in Strained-Layer Superlattices." S. Ashrafi, A.W. Saenz, and H. Uberall, Dept of Physics, Catholic Univ. of America, and R. Fusina, NRL, *Journal of the Optical Society of America B*, Vol. 8, No. 12, 2513-2518, Dec 1991.

"Linear Polarization of Radiation for Planar Channeled Electrons and Positons", R. Fusina, *Phys. Rev. B*, 43, 11, 367, May 1991.

"Radar Imaging of Thermal Fronts." F. Askari, G.L. Geernaert, W.C. Keller, *International Journal of Remote Sensing*, Taylor and France, 1991.

"Measurements of Electromagnetic Bias in Radar Altimetry." W.K. Melville, R.W. Steward, W.C. Keller, J.A. Kong, D.V. Arnold, A.T. Jessup, M.R. Lowen, and A.M. Slinn, *J. Geophys. Res.*, Vol. 96, pp. 4915-4924, 15 March 1991.

"A Comparison of  $K_u$ -Band Doppler Measurements at 20° Incidence with Predictions from a Time-Dependent Scattering Model." D.R. Thompson, B.L. Gotwols, and W.C. Keller, *J. Geophys. Res.*, Vol. 96, pp. 4947-4955, 15 March 1991.

"Multibeam Radar Altimetry: Spaceborne Feasibility." L.S. Miller, G.S. Brown, and L.W. Choy, *IEEE Trans. of Geoscience and Remote Sensing*, Vol. 29, No. 3, pp. 465-469, May 1991.

"Speckle Reduction in Multipolarization, Multifrequency SAR Imagery", J.S. Lee, M.R. Grunes, and S.A. Mango, *IEEE Trans. on Geoscience and Remote Sensing* Vol. 29, No. 4, pp. 535-544, July 1991.

"A Three-Frequency Scatterometer Technique for the Measurement of Ocean Wave Spectra," D.L. Schuler, W.C. Keller, and W.J. Plant, IEEE Trans. on Ocean Engineering, Vol. 16, No. 3, pp. 244-253, July 1991.

"Field Aligned Dynamics of Chemically Induced Perturbation to the Ionosphere," P.A. Bernhardt, P. Rodriguez, C.L. Siegring and C.S. Lin, JGR, Vol. 96, No. A8, pp. 13, 887-13900, August 1991.

"Breaking Waves Affecting Microwave Backscatter 1. Detection and Verification," A.T. Jessup, W.K. Melville, and W.C. Keller, J. Geophys. Resl, Vol 96, pp. 20547-20559, 15 November 1991.

"Breaking Waves Affecting Microwave Backscatter 2. Dependence on Wind and Wave Conditions," A.T. Jessup, W.K. Melville, and W.C. Keller, J. Geophys. Resl, Vol 96, pp. 20561-20569, 15 November 1991.

"Radar Surface Signatures Based on the Two-Dimensional Tidal Circulation of Phelps Bank," S.R. Chubb, G.R. Valenzuela, and D.A. Greenberg, IEEE Trans., GE-29, 129-134, 1991.

"Aircraft Laser Sensing of Sound Velocity in Water: Brillouin Scattering," G. D. Hickman, J.M. Harding, M. Carnes, and A. Pressman, G.W. Kattawar, and E.S. Fry, Remote Sensing Environment, Vol. 36, pp. 165-178, 1991.

"Speckle Reduction in Multipolarization and multifrequency SAR Imagery," J. S. Lee, M. Grunes and S. Mango, IEEE Trans. Geoscience and Remote Sensing, Vol. 29, no. 4, pp.535-544, July 1991.

"A Three-frequency Scatterometer Technique for the Measurement of Ocean Wave Spectra," D.L. Schuler, W.C. Keller, and W.J. Plant, IEEE J. of Oceanic Engineering, vol.16, no. 3, 244-253 1991.

"Preliminary Investigation of the Nature of Radar Signatures of the Gulf Stream with SAR. Presented at IGARRS ," Chubb, S.R., A.L. Cooper, G.R. Valenzuela, C. Shen, R.P. Mied, G.O. Marmorino, C. Trump, A.R. O Chadlick, J. Morrison, and J.R. Bennett, '91, Helsinki, Finland, June 3-6 Proc. of IGARRS '91, p. 122A, 1991.\*

"Vortex Shedding Lock-On and Flow Control in Bluff Body Wakes," Griffin, O.M. and Hall, M., ASME Journal of Fluids Engineering v. 113, 526-537, 1991.

"A Numerical Study of Passive Pressure-Drag Control in a Plane Vortex Wake," Grinstein, F.F., Boris, J.P. and Griffin, O.M., AIAA Journal, v. 29, 1436-1442.

"Note on the Cancellation of Contaminating Noise in the Measurement of Turbulent Wall Pressure Fluctuations," Home, M.P. and Handler, R.A., Experiments in Fluids, 12, 136-139, 1991.

"Turbulent Mixing Induced By Upgoing Near-Inertial Waves In The Seasonal Thermocline Of The Norwegian Sea," Marmorino, G.O. and Trump, C.L., Journal of Geophysical Research, 96, 7137-7143, 1991.

"Intrusions And Diffusive Interface In A Salt-Fingering Staircase," Marmorino, G.O., Deep-Sea Research, 38, 1431-1454, 1991.

"The Generation And Evolution Of Mushroom-Like Vortices," Mied, R.P., McWilliams, J.C., and Lindemann, G.J., J. Phys. Oceanogr., 21, 489-510, 1991.

"Examination of Wall Damping for the k, Turbulence Model Using Direct Simulations of Turbulent Channel Flow," Miner, E.W., Swean, T.F., Jr., Handler, R.A., and Leighton, R.I., International Journal of Numerical Methods in Fluids, v. 12, 609-624, 1991.

"Redistribution Of Surface-Active Materials In A Ship Wake," Peltzer, R.D., Griffin, O.M., Barger, W.R. and Kaiser, J.A.C., ASME Applied Mechanics Conference, Columbus, Ohio, June 1991, in Dynamics of Bubbles and Vortices Near a Free Surface, ASME AMD-Vol. 119 (I. Sabin et al, eds.), ASME, NY, 1991.

"Scale Transition Of Double-Diffusive Finger Cells," Shen, C.Y. and Veronis, G., Physics of Fluids, A (3), 58-68, 1991.

"Numerical Modeling Of The Salt-Finger Interface," Shen, C.Y., Double-diffusion in Oceanography, conference proceedings. Ed: R. Schmitt, Woods Hole Oceanographic Institution, 1991.\*

"Propagating Structures In Wall-Bounded Turbulent Flows," Sirovich, L., Ball, K.S., and Handler, R.A., Theoretical and Computational Fluid Dynamics, v. 2, 307-317, 1991.

"Anisotropy in a Turbulent Jet Near a Free Surface," Swean, T.F., Jr., Ramberg, S.E. and Miner, E.W., ASME Journal of Fluid Engineering, v. 113, 430-438, 1991.

"Single Ping Adcp Data," Trump, C.L., IEEE Journal of Oceanic Engineering, 16(4), 382-389, 1991.

"Airsar Observations Of The Gulf Stream With Interpretation From Sea Truth And Modeling," Valenzuela, G.R., Trump, C.L., S.L. Cooper, J.A.C. Kaiser, R.P. Mied et al, Proceedings of the Third Airborne Synthetic Aperture Radar (AIRSAR) Workshop, May 23-24, Jakob J. va Zyl ed. JPL #91-30, Pasadena, Ca, 98-108, 1991.\*

"Topographic Effects On The Seasonal Circulation Of The Indian Ocean," Kindle, J.C., J. Geophys. Res., Vol. 96, No. C9, pp. 16827-16837, 1991.

"Studies Of The Arctic Ice Cover And Upper Ocean With A Coupled Ice-Ocean Model," Piacsek, S.A., R.A. Allard, and A. Warn-Varnas, J. Geophys. Res., 96, 4631-4650, 1991.

"The Development Of A Coupled Ice-Ocean Model For Forecasting Ice Conditions In The Arctic," Riedlinger, S.H., and R.H. Preller, J. Geophys. Res., 96, pp. 16955-16977, 1991.

"Synoptic And Seasonal Variations Of The Ice-Ocean Circulation In The Arctic: A Numerical Study," Warn-Varnas, A., R. Allard, and S.A. Piacsek, Annals Glaciol., 15, pp. 54-62, 1991.

"Impact of Biofouling on the Electrochemical Behavior of 304 Stainless Steel in Natural Seawater," Brenda Little, Richard Ray, Pat Wagner, et al Biofouling 3 pp 45-49, 1991.

"Microbiologically Influenced Corrosion of Metals and Alloys," Brenda Little, Pat Wagner and Florian Mansfeld Int. Materials Res. Journal 36(6), pp 253-272, 1991.

"Corrosion Products and Mechanisms in Long-Term Corrosion of Copper," Little Brenda J. and M.B. McNeil Materials Research Society, 212, 1991.



"Correlation of Laboratory Results With Observations on Long Term Corrosion of Iron and Copper Alloys." Brenda Little, Michael McNeill and D.W. Mohr Materials Research Society, 185, pp 753-759.

"A Comparison of GEOSAT Altimeter and Synthetic Aperture Radar Measurements Over East Greenland Pack Ice." Fetterer, F.M., S. Laxon and D.R. Johnson Int. J. Remote Sensing, 12. pp 569-583, 1991.

"A Comparison of Observed and Modelled Sea-Surface Topographic Comparison of Observed and Modelled Sea-Surface Topographic Time-Series Near the New England Seamounts." Hallock, Z.R., W.J. Teague and J.D. Thompson J. Geophys. Res. 96(C7), pp 635-12, 644, 1991.

"Topographic Effects on the Seasonal Circulation of the Indian Ocean," Kindle, J.C. J. Geophys. Res., 96(C9), pp 16827-16837, 1991.

"The Hybrid Polynya at the Northern End of Nares Strait." Kozo, Thomas L., Geophysical Research Letters, 18(11) pp 059-2062.

"Correlation of Laboratory Results with Observations on Long-Term Corrosion of Iron and Copper Alloys." Little, B.J., M.B. McNeil and D.W. Mohr Materials Research Society, Materials Issues in Art and Archaeology, 185, P.B. Vandiver, J.R. Druzik and G. Wheeler (eds), pp 753-759, 1991.

"A Technical Review of Electrochemical Techniques Applied to MIC. Corrosion Science." Little, B., F. Mansfeld 32(3), pp 247-292, 1991.

"Focusing on Microbiologically Influenced Corrosion." Little, B., Crum, J.R. Nuclear Engineering International, December, pp 47-48, 1991.

"The Corrosion Behavior of Stainless Steels and Copper Alloys Exposed to Natural Seawater." Brenda Little, Werkstoffe Und Korrosion, 42, pp331-340, 1991.

"Colonization of Copper Surfaces by Sulfate-Reducing Bacteria Scanning." Brenda Little, Patricia Wagner, Ricky Ray, Robert Pope, and Raymond Scheetz 13, Suppl. I., 1991.

"Biofilms: An ESEM Evaluation of Artifacts Introduced During SEM Preparation Evaluated by ESEM." Brenda Little, Patricia Wagner, and Richard Ray, Industrial Microbiology, 8, pp 213-222, 1991.

"Composition Variations in Copper-Nickel Butt Welds." Little, B., R.N. Lee, M.K. Norr, O. John Jacobus and P. Wagner, Corrosion, 47(8), pp 645-652, 1991.

"Microbiologically Influenced Corrosion of Metals and Alloys." Little, B., P. Wagner, and F. Mansfeld International Materials Review, 36(6), pp 253-272, 1991.

"Impact of Biofouling on the Electrochemical Behavior of 304 Stainless Steel in Natural Seawater." Little, B.J., R.I. Ray, P.A. Wagner, Z. Lewandowski, W.C. Lee, W. G. Characklis and F.B. Mansfeld Biofouling, 3, pp 45-59, 1991.

"Composition Variations in Copper-Nickel Butt Weld." Wagner, P., B. Little, R.N. Lee, M.K. Norr, R.I. Ray and O. John Jacobus Corrosion, 47(8), pp 645-652, 1991.

"Impact of Biofouling on the Electrochemical Behavior of Stainless Steels in Natural Seawater." Patricia Wagner, Brenda Little, Richard Ray, Zbigniew Lewandowski, Whon Chee Lee, William G. Characklis and Florian Mansfeld, *Biofouling*, pp 45-59, 1991.

"An Electrochemical and Surface Analytical Study of Stainless Steels and Titanium Exposed to Natural Seawater," Wagner, P., B. Little, F. Mansfeld, R. Tsai, H. Shih, and R. Ray *Corrosion Science*, 33(3), pp 445-456, 1991.

"Events Proceeding the 1991-92 El Nino. Part II. The Ocean Response to Operational Westerly Wind Burst," Kindle, J. and Pat Phoebus, *J. Geophysical Res.* (accepted for publication).

"Towfish Altitude Computation Using Optimal Layback Estimation and Multipath Acoustic Ranging," Trahan, R., Yeadon, D., and Thiele, M., *IEE Journal of Oceanic, Oceanic Society Engineering*, May 1991.

"Optimal Estimation Of Layback Distance For Marine Towed Cable," Trahan, R. D., Yeadon, D. S., and Thiele, M. G., *IEEE Oceanic Journal of Society*, May 1991.

"Fiber Optics Technology for Naval Ships," Holland, C. R. and Jovanovich, K., *IEEE*, April 1991.

"High-Resolution Geoacoustic Studies In Deep Ocean Environments," Gettrust, J.F. And M.M. Rowe, *Proc. Of Oceans '91, IEEE*, P. 442-445, *Proceedings*, 1991\*.

"Gps And Airborne Gravimetry: Recent Progress And Future Plans," Brozena, J.M., *Bull. Geod.*, 65, 116-121, 1991.

"Bathymetry of the Barents and Kara Seas," Cherkis, N.Z., H.S. Fleming, M.D. Max, P.R. Vogt, M.F. Czarnecki, Y. Kristoffersen, A. Midthassel, and K. Rokoengen, *Geol. Soc. Amer. Map and Chart Series*, MCH047, 1991.

"Gulf Coast-East Coast Magnetic Anomaly: I. Root Of The Main Crustal Decollement For The Appalachain-Ouachita Orogen," LeFort, J.P., and M.D. Max, *Geology*, 19, 670, 1991.

"Is There An Archean Crust Beneath Chesapeake Bay?," LeFort, J.P., and M.D. Max, *Tectonics*, 10, 213-226, 1991.

"Mantle Downwelling Beneath The Australian-Antarctic Zone: Evidence From Geoid Height Vs. Topography," Marks, K.M., D.T. Sandwell, P.R. Vogt, and S.A. Hall, *Earth Planet. Sci. Lett.*, 103, 325-338, 1991.

"National Workshop on Gas Hydrates," Max, M.D., W.P. Dillon, R.D. Malone and K. Kvenvolden, *EOS, Trans. AGU* 72, 476-477; 1991.

"Acoustic Imaging Of Hydrothermal Plumes East Pacific Rise, 21°N, 109°W," Rona, P.A., D.R. Palmer, C. Jones, D.A. Chayes, M. Czarnecki, E.W. Carey, and J.C. Guerrero, *Geophys. Res. Lett.*, 18, 2233-2236, 1991.

"Estuarine Stream Piracy: Calvert County, U.S. Atlantic Coastal Plain," Vogt, P.R., *Geology*, 19, 754-757. 1991.

"Satellite Radar Altimetry Aids Seafloor Mapping," Vogt, P.R., and W-Y. Jung, *EOS, Trans. AGU* 72, 468-469, 1991.

"A FORTRAN Program for Computing Beam Patterns of Geophone Arrays." Beckleheimer, J.L., Computers and Geosciences, V. 17, No. 5, p. 633-640, 1991.

"Pore Pressures and Permeabilities Measured in Marine Sediments with a Tethered Probe." Davis, E.E., G.C. Horel, R.D. McDonald, H. Villinger, R.H. Bennett, and H. Li, 1991, Journ. Geophysical Research, V. 96, No. B4, p. 5975-5984, 1991.

"Geological Interpretations Based on Deep-Tow Single Channel and Multichannel Seismic Data from the Bermuda Rise." Bowles, F.A., J.F. Gettrust, and M.M. Rowe, Marine Geology, V. 96, P. 279-293, 1991.

"Geological Interpretations Based on Deep-Tow Single Channel and Multichannel Seismic Data From the Bermuda Rise." Bowles, F.A., J.F. Gettrust, and M.M. Rowe, Marine Geology, V. 96, p. 279-293, 1991.

"Measurements and Modeling of Possible Mantle Constitutes From a Long-Line Seismic Refraction Experiment in the West Philippine Basin, Geophysical Journal International." Goodman, D. and L.D. Bibee, 106, 667, 1991.

"Geological Interpretations Based on Deep-Tow Single Channel and Multichannel Seismic Data From the Bermuda Rise," Bowles, F.A., J.F. Gettrust, and M.M. Rowe, Marine Geology, V. 96, p. 279-293, 1991.

"Development of a Low Frequency, Deep Tow Geoacoustics System." Gettrust, J.F., J.H. Ross, and M.M. Rowe, Sea Technology, V. 32, p. 23-32, 1991.

"Biogenic Gas in Shallow Water Sediments as Indicated by High Resolution Seismic Records." Lambert, D.N., Acoust. Soc. Of Am., Annual Meeting, Baltimore, Md, JASA, V. 89, No. 4, Pt. 2, p. 1854, 1991.

"Pore Pressures and Permeabilities Measured in Marine Sediments with a Tethered Probe." Davis, E.E., G.C. Horel, R.D. McDonald, H. Villinger, R.H. Bennett, and H. Li, Journal Geophysical Research, V. 96, No. B4, p. 5975-5984, 1991.

"The Influence of Organic Carbon Flux on the Deposition of Clays in the Marine Environment: Implications with Respect to Microstructure. In: Microstructure of Fine-Grained Sediments." Fischer, K.M., Springer-Verlag, P. 147-159, 1991.

"Implications of Deep Water Seismometer Array Measurements For Scholte Wave Propagation, Shear Waves In Marine." Bibee, L. D. and L.M. Dorman, Eds, J. Hovem, M. Richardson, and R. Stoll, Kluwer Academic Publishers, Boston, MA, 1991.

"Design of the Geophysical Airborne Survey System: A Distributed Microprocessor Application." Bourgeois, B., M. Harris, P. Wischow, J. Ross, A. Martinez, P. Duvoisin, and H. Barad, ISMM Microcomputer Applications, April 1991.

"High Accuracy Magnetic Measurements with the ASO-81 Scalar Magnetometer", Bourgeois, B., J. Ross, and W. Avera, IEEE, Transactions on Instrumentation and Measurements, August 1991.

"Eigenanalysis of Bottom Reflectance Spectra." Estep, L., The Hydrographic Journal, October 1991.

"Estimators of Bottom Reflectance Spectra." Estep L., J. Holloway, International Journal of Remote Sensing, April 1991.

"Bottom Reflectance Contamination of the Downwelling Light Stream," Estep, L., Journal of Wave Material Interaction, July 1991.



d. Refereed Journals

1992:

"Comparison Of Seu Rate Prediction Techniques", Adams, James H.(Dr), E. L. Peterson, Ieee Transactions On Nuclear Science, Vol. 39 #6, pp. 1836---, December, 1992.

"Rate Prediction For Single Event Effects", Adams, James H.(Dr), E. C. Smith, E. L. Peterson, J. C. Pickel, Ieee Transactions On Nuclear Science, Vol. 39 #6, pp. 1577-1599, December, 1992.

"Modulation Transfer Function Measurement Technique For Small-Pixel Detectors", Marchywka, Michael J., Socker, Dennis G.(Dr), Applied Optics, Vol. 31 #34, pp. 7198-7213, December, 1992.

"The Sun In A Non-Cycling State", Lean, Judith (Dr), A. Skumanich,, O. R. White, S. L. Neil, W. C. Livingston, The Astronomical Soc. Of The Pacific, Vol. 104, Pp. 1139-1143, December, 1992.

"Yohkoh Bragg Crystal Spectrometer Observations Of The Dynamics And Temperature Behavior Of A Soft X-Ray Flare", Doschek, George A.(Dr), Feldman, Uri (Dr), Brown, Charles M.(Dr), Mariska, John T.(Dr), A. Phillips, Bentley, Culhane, Hiei, K. Phillip, Lang, Sterling, Watanabe, Pub Of Astron. Soc. Of Japan, Vol. 44, pp. L95-L99, December, 1992.

"Xuv Line Ratios For Ca Xv Applicable To Solar Flare Spectra", Widing, Kenneth G.(Dr), E. S. Conlon, F. P. Keenan, K. M. Aggarwal, V. J. Foster, Astrophysical Journal, Vol. 401, pp. 411-415, December, 1992.

"A New Determination Of The Solar Rotation Rate", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), A. G. Nash, Astrophysical Journal, Vol. 401, pp. 378-385, December, 1992.

"Titan's Upper Atmosphere: Structure And Ultraviolet Emissions", Summers, Michael (Dr), Strobel, Darrell, Zhu,X, Icarus, Vol. 100, pp. 512-526, December, 1992.

"Mass Transfer And Loss In Interacting Disk Galaxies", B. V. Stuart, J. F. Wallin, Astrophysical Journal, Vol. 399, pp. 29-37, November, 1992.

"The 57co Abundance In Supernovae 1987a", Kurfess, James D.(Dr), Johnson, Neil (Dr), D. D. Clayton, L. S. The, M. D. Leising,, Astrophysical Journal Letters, Vol. 399, pp. L141-L144, November, 1992.

"Oriented Scintillation Spectrometer Experiment Observations Of 57co In Sn 1987a", Kurfess, James D.(Dr), Kinzer, Robert L.(Dr), Johnson, Neil (Dr), Kroeger, Richard (Dr), Strickman, Mark S.(Dr), Grove, Jon Eric(Dr), Cameron, Clayton, Leising, Grabelsky, Jung, Purcell, Ulmer, Astrophysical Journal Letters, Vol. 399, pp. L137-L140, November, 1992.

"Diagnostics Of Electron-Heated Solar Flare Models Iii. Effects Of Tapered Loop Geometry And Preheating", Mariska, John T.(Dr), Emslie,A., Li,P., Astrophysical Journal, Vol. 399, pp. 714-723, November, 1992.

"Upper Limit On The Steady Emission Of The 2.223 Mev Neutron Capture X-Ray Line From The Sun", Share, Gerald H.(Dr), Murphy, Ronald J. (Dr), Beall, James H. (Dr.), Harris, Michael, Solar Physics, Vol. 142, pp. 171-185, November, 1992.

\* Believed to be Peer-Reviewed.

"Theoretical Prediction For Scattering From Elastic Cylinders With Hemispherical Caps and Comparison To Data." M.F. Werby and C.E. Dean, Journal De Physique IV, pp 1019-1022, April 1992.

"The Excitation Of Water-Borne Waves At The Interface Of Evacuated Elastic Spherical Shells And Pseudo-Stoneley Resonances." M.F. Werby, and H. Uberall, Journal De Physique IV, pp 1087-1090, April 1992.

"Shell Theories With Fluid Loading To Approximate Scattering From Submerged Bounded Objects." M.F. Werby (2nd) and C.E. Dean (1st), Journal De Physique IV, pp 1099-1102, April 1992.

"Forward Scattering From Fetch-Limited and Swell-Contaminated Sea Surfaces." R.S. Keiffer (2nd), J.C. Novarini (2nd), and J.W. Caruthers, JASA, Volume 92, Number 4, Part 1, October 1992.

"Strong Resonance Features Present In The Acoustic Signatures Of Submerged Elastic Structures." M.F. Werby and G.C. Gaunaud, Optical Engineering, Volume 31, Number 12, pp 2562-2571, December 1992.

"Parabolic Equation Mean Acoustic Propagation Algorithm." R. Oba, Acoustic Letters, Volume 16, Number 3, 1992.

"Solution Of The Helmholtz-Poincare' Wave Equation Using the Coupled Boundary Integral Equations and Optimum Surface Eigenfunctions." M.F. Werby, M.K. Broadhead, M.R. Strayer, and C. Bottcher, Computational Mech. Mechanics Publication Elsevier Applied Science, pp 245-258, 1992.

"Solution Of A Class Of Sturm-Liouville Problems Using The Galerkin Method With Global Basis Functions." M.F. Werby (3rd), C. Bottcher (1st), M.R. Strayer (2nd), Computational Mech. Mechanics Publication Elsevier Applied Science, pp 775-788, 1992.

"Hamilton's Principal And The Equations Of Motion Of An Elastic Shell With And Without Fluid Loading." M.F. Werby (2nd) and C.E. Dean, Computational and Applied Mathematics II: Differential Equations, Computational and Applied Mechanics, Volume II, pp 131-140, 1992.

"Near-Field Acoustic Scattering from Simulated Two-Dimensional, Wind-Driven Sea Surfaces." J.W. Caruthers, J.C. Novarini and R.S. Keiffer, J. Acoust. Soc. Am., Vol.91, pp 813-822, 1992.

"Fluctuations of High-Frequency Shallow-Water Seafloor Reverberation." S. Stanic and E. Kennedy, J. Acoust. Soc. Am.; 91 (4), Pt. 1, April 1992.

"Properties of Higher-Order Correlations and Spectra for Bandlimited Deterministic Transients." L. Pflug, G. Ioup, J. Ioup, and R. Field, JASA, 91 (2), February 1992.

"Matched-Field Processing Enhancement in a Shallow-Water Environment by Incoherent Broadband Averaging." G.B. Smith, C. Feuillade and D.R. Del Balzo, J. Acoust. Soc. Am. 91 (3), pp 1447-1455, March 1992.

"Least-Squares Time-Delay Estimation for Transient Signals in Multipath Environment." R.L. Field, R.J. Vaccaro, C.S. Ramalingham and D.W. Tufts, J. Acoust. Soc. Am. 92 (1), pp 210-218, July 1992.

"Detection of Oscillatory and Impulsive Transients Using Higher Order Correlations and Spectra." L. Pflug, G. Ioup, J. Ioup, K. Barnes, R. Field and G. Rayborn, J. Acoust. Soc. Am. 91 (5), May 1992.

"Source Imaging and Sidelobe Suppression Using Time-Domain Techniques in a Shallow-Water Waveguide." C. Feuillade and C.S. Clay, JASA, 92 (4), Pt. 1, pp 2165-2172, October 1992.

"Propogation of Low-Frequency Acoustic Energy in Shallow Ice-Covered Seas." C. Mire, R.E. Keenan and L. Merrian, JUA, Vol. 42, No. 4, pp 1199-1224, October 1992.

"Critical Sea Test Program Volume Scatter and Distant Reverberation Investigations." C.H. Thompson (3rd), R.H. Love (4th), J.M. Monti, C.S. Hayek, D.M. Potter, J.H. Sweeney, D.P. Ecuyer, T.A. Best and E. Beeson, JUA, Vol. 42, No. 2, 1992.

"Aspects of Transient Source Extraction for Target Classification in Shallow-Water Environments." M.K. Braodhead and B. Field, JUA, Vol. 42, No. 4, pp 1309-1340, October 1992.

"Susim/Uars Observations Of The 120 To 300 Nm Solar Maximum Irradiance: Inferences For The 11 Year Cycle", Prinz, Dianne K.(Dr), Brueckner, Guenter E.(Dr), Vanhoosier, Michael E., Lean, Judith (Dr), K. Edlow, L. Floyd, Geophysical Research Letters, Vol. 19 #22, Pp. 2203-2206, November, 1992.

"Optical Constants Of Thin Silicon Films Near The Silicon L2.3 Absorption Edge", Seely, John F.(Dr), Kowalski, Michael P.(Dr), Hunter, W.R., Rife, J.C, Applied Optics, Vol. 31 #34, Pp. 7367-7370, December, 1992.

"Quasars, Blazars, And Gamma Rays", Dermer, Charles D. (Dr.), R. Schlickeiser, Science Magazine, Vol. 257, Pp. 1642-1647, September, 1992.

"First-Order Fermi Acceleration In Spherically Symmetric Flows: Solutions Including Quadraic Losses", P. A. Becker, Astrophysical Journal, Vol. 397, Pp. 88-116, September, 1992.

"A Fourier Transform Microscope For X-Ray Imaging", Feldman, Uri (Dr), Wood, Kent S.(Dr), D. Kania, P. Becker, R. Nemiroff, Review Of Scientific Instruments, Vol. 63, Pp. 5089-5093, October, 1992.

"Clusters In Collision?", Kowalski, Michael P.(Dr), G. R. Wirth, M. P. Ulmer, Astrophysical Journal, Vol. 397, Pp. 430-437, October, 1992.

"A Fourier Transform Microscope For X-Ray Imaging", Feldman, Uri (Dr), Wood, Kent S.(Dr), P. Becker, R. Nemiroff, Review Of Scientific Instruments, Vol. 63 #10, Pp. 5089-5093, October, 1992.

"The Yohkoh Mission For High Energy Solar Physics", Doschek, George A.(Dr), Tsuneta, S., Ogawara, Y., Bentley, R., Bruner, M., Canfield, R., Culhane, L., Hiei, E., Watanabe, T., Nishimura, J., Makishima, K., Hudson, H., Lang, J., Kosugi, T., Science Magazine, Vol. 258, Pp. 618, October, 1992.

"A Burst Model For Line Emission In The Solar Atmosphere. Ii. Coronal Xuv Lines", Feldman, Uri (Dr), J. M. Laming, P. Mandelbaum, Astrophysical Journal, Vol. 398, Pp. 692-697, October, 1992.

"Noise-Driven Radiative Shocks: Further Implications For The Quasi-Periodic Oscillation Of The Am Hercules Object", Wolff, Michael T. (Dr), Wood, Kent S.(Dr), J. N. Imamura, Astrophysical Journal, Vol. 398, Pp. 593-601, October, 1992.



"Absolute O And O2 Concentrations In The Thermosphere From Skylab Occultation Data", Meier, Robert R.(Dr), Feldman, Uri (Dr), Brown, Charles M.(Dr), Picone, Michael (Dr), Journal Of Geophysical Research, Vol. 40 #8, Pp. 1153-1166, August, 1992.

"Observation Of Upflows During Soft X-Ray Solar Flares", Feldman, Uri (Dr), Seely, John F.(Dr), Astrophysical Journal, Vol. 394, Pp. 697-702, August, 1992.

"Estimating The Sun's Radiative Output During The Maunder Minimum", Lean, Judith (Dr), A. Skumanick, O. White, W. Livingston, Geophysical Res. Letters, Vol. 19 #15, Pp. 1591-1594, August, 1992.

"Elemental Abundances In The Upper Solar Atmosphere", Feldman, Uri (Dr), Physica Scripta, Vol. 46, Pp. 202-220, August, 1992.

"Calculation Of Co2 15 Micron Band Atmospheric Cooling Rates By Curtis Matrix Interpolation Of Correlated-K Coefficients", Summers, Michael (Dr), Strobel, Darrell, Zhu,X., Journal Of Geophysical Research, Vol. 97 #D12, Pp. 12,787-12,797, August, 1992.

"X-Ray Variability Of Scorpius X-1 During A Multiwavelength Campaign", Hertz, Paul (Dr), Wood, Kent S.(Dr), B. Vaughan, J. P. Norris, K. Mitsuda, P. F. Michelson, T. Dotani, Astrophysical Journal, Vol. 396, Pp. 201-218, September, 1992.

"Upper Limit On The Steady Emission Of The 2.223 Mev Neutron Capture X-Ray Line From The Sun", Share, Gerald H.(Dr), Murphy, Ronald J. (Dr), Beall, James H. (Dr.), Harris, Michael, Solar Physics, Vol. 142, Pp. 171-185, September, 1992.

"The Hydrogen Coma Of Comet P/Halley Observed In Lyman A Using Sounding Rockets", Meier, Robert R.(Dr), Mccoy, Robert P.(Dr), Carruthers, George R.(Dr), C. B. Opal, H. U. Keller, Astronomy And Astrophysics, Vol. 258, Pp. 555-565, May, 1992.

"A Thermal/Nonthermal Model For Solar Microwave Bursts", G. D. Holman, S. G. Benka, Astrophysical Journal, Vol. 391, Pp. 854-864, June, 1992.

"Superconducting Detectors For Photon And Particle Detection: Criteria For Transitions To Normal State", Vanvechten, Debbie (Dr), Wood, Kent S.(Dr), Physica, Vol. 314, Pp. 86-112, June, 1992.

"On Potential Field Models Of The Solar Corona", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), Astrophysical Journal, Vol. 392, Pp. 310-319, June, 1992.

"Search For Bursts From Soft Gamma Repeaters With Smm/Hxrbs", Wood, Kent S.(Dr), L. E. Orwig, T. L. Cline, U. D. Desai, B. R. Dennis, C. Kouveliotou, J. P. Norris, Astrophysical Journal, Vol. 392, Pp. 179-186, June, 1992.

"Element Abundances And Plasmas In A Coronal Polar Plume Properties", Feldman, Uri (Dr), Widing, Kenneth G.(Dr), Astrophysical Journal, Vol. 392, Pp. 715-721, June, 1992.

"The Potential For Plasma Diagnostics From Stellar Euv Observations", Doschek, George A.(Dr), Feldman, Uri (Dr), Seely, John F.(Dr), P. Mandelbaum, Astrophysical Journal Supplement, Vol. 81, Pp. 387-408, July, 1992.

"Cosmic Radiation: Constraints On Space Exploration", Adams, James H.(Dr), Nuclear Tracks & Radiation Measurements, Vol. 20 #3, Pp. 397-401, July, 1992.

"On The Thermal Structure Of Triton's Thermosphere", Summers, Michael (Dr), Strobel, Darrell, Stevens, Yelle, Geophysical Research Letters, Vol. 19 #7, Pp. 669-672, April, 1992.

"Ne V Line Ratios In The Euv Spectra Of Solar Flares", Widing, Kenneth G.(Dr), E. S. Conlon,, F. P. Keenan, K. M. Aggarwal, L. K. Harra, Astrophysical Journal, Vol. 389, Pp. 440-442, April, 1992.

"Variations In The Relative Elemental Abundances Of Oxygen, Neon, Magnesium And Iron In High-Temperature Solar Active-Region And Flare Plasmas", Feldman, Uri (Dr), D. L. Mckinzie, Astrophysical Journal, Vol. 389, Pp. 764-776, April, 1992.

"Current Developments And Future Prospects In Space Transportation", Carruthers, George R.(Dr), Journal Of The National Tech. Assoc, Pp. 52-64, May, 1992.

"Density Diagnostic Of An Uranium Laser Produced Plasma From Line Ratio Of N=1 Transitions In Ni-Like Uranium", Feldman, Uri (Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), P. Mandelbaum, Physical Review A, Vol. 45 #10, Pp. 7480-7483, May, 1992.

"The 3d-4p X-Ray Spectrum Emitted By Highly Ionized Uranium From A Laser Produced Plasma In The 3.8 Å < > 4.4 Å Wavelength Range", Seely, John F.(Dr), D. P. Kania, P. Mandelbaum, R. L. Kauffman, Physical Review A, Vol. 45 #10, Pp. 7484-7487, May, 1992.

"The Sun As A Star: High Spectral Resolution Solar Data Degraded To Low Dispersion Iue Resolution", Cook, John W.(Dr), J. G. Doyle, Astrophysical Journal, Vol. 391, Pp. 393-402, May, 1992.

"The Cosmos/Ukst Catalog Of The Southern Sky", Gursky, Herbert (Dr), Yentis, Daryl J.(Dr), Cruddace, Raymond G.(Dr), B. J. Wallin, H. Macgillivray, C. Collins, Digitized Optical Sky Surveys Proc., Vol. Book, Pp. 67-76, January, 1992.

"Fe Ii Emission Lines II. Excitation Mechanisms In Cool Stars", Feldman, Uri (Dr), P. G. Judge, C. Jordan, Astrophysical Journal, Vol. 384, Pp. 613-623, January, 1992.

"Civ Line Ratios In The Sun", Widing, Kenneth G.(Dr), E. S. Conlon, F. P. Keenan, L. K. Harra, V. M. Burke, Astrophysical Journal, Vol. 385, Pp. 381-383, January, 1992.

"Transitions From Metastable Levels Emitted During Short Duration Bursts: How Valid Are Their Calculated Intensities?", Feldman, Uri (Dr), Astrophysical Journal, Vol. 385, Pp. 758-762, February, 1992.

"A Burst Model For Line Emission In The Solar Atmosphere. I. Euv Lines Of He I And He Ii In Impulsive Flares", Feldman, Uri (Dr), J. M. Laming, Astrophysical Journal, Vol. 386, Pp. 364-370, February, 1992.

"The Flux Transport Model And Its Implications", Sheeley, Neil R.(Dr), Astronomical Soc Of The Pacific, Vol. 27, Pp. 1-13, March, 1992.

"Solar Si Ii Line Ratios From The High Resolution Telescope And Spectrograph", Cook, John W.(Dr), A. E. Kingston, K. P. Keenan, P. L. Dufton, Astrophysical Journal, Vol. 387, Pp. 726-731, March, 1992.

"Mg Ii Absolute Line Profiles For Late-Type Stars And For Spatially-Resolved Solar Regions", Cheng, Chung-Chieh (Dr), M. Cerruti-Sola, R. Pallavicini, Astronomy & Astrophysics, Vol. 256, Pp. 185-194, April, 1992.

"Remote Sensing Of Surface Ship Wakes." Griffin, O.M., Peltzer, R.D., Reed, A.M., and Beck, R.F., Naval Engineers Journal, 104 (3), 245-258, 1992.

"Non-axisymmetric Waves of a Stratified Vertical Vortex." Fung, Y.T., Journal of Applied Mechanics, v. 59, 445-449, 1992.

"Vortex Shedding and Lock-On in Bluff Body Wakes." Hall, M.S. and Griffin, O.M., ASME Journal of Fluids Engineering, to appear v. 115, June 1992.

"On the role of accelerating fluid particles in the generation of Reynolds stress." Handler, R.A., Bernard, P.S., Rovelstad, A.L. and Swearingen, J.D., Physics of Fluids A, 4, 1317-1319, 1992.

"High-Wave Number Shear And Temperature Structure During The Patches Experiment." Marmorino, G.O. and Trump, C.L., Journal of Geophysical Research, 97 , 2309-2318, 1992:.

"ADCP Measurements Of Possible Lee Waves Observed Near Key West, Florida." Marmorino, G.O. and Trump, C.L., Journal of Geophysical Research, 97 (C-5), 7271-7275, 1992.

"Rotating Modons Over Isolated Topography." Mied, R.P., Kirwan, A.D., and Lindemann, G.J., J. Phys. Oceanogr., 22, 1569-1582, 1992

"High Resolution Measurement Of Surface-Active Film Redistribution In Ship Wakes." Peltzer, R.D., Griffin, O.M., Barger, W.R. and Kaiser, J.A.C., Journal of Geophysical Research, 97 (C4), 5231-5252, 1992.

"Unmanned Undersea Vehicle Technology In The US." Steiger, D., Undersea Defense Technology 92, Conference Proceedings, UK, June, 1992.\*

"Stability Aspects Of The Vortex Ring/Wall Interaction Problem." (with J.D. Swearingen and J.D. Crouch), Swearingen, J.D., Crouch, J.D., and Handler, R.A., ASME Fluids Engineering Conference, Los Angeles, CA, June 1992.

"Equal Path Length Design For A Phased Array Antenna System." S. N. Samaddar, Journal of the Franklin Institute, Vol.ume 329, No. 1, pp. 37-44, 1992.

"Transient Radiation Of A Single-Cycle Sinusoidal Pulse From A Thin Dipole." S. N. Samaddar, Journal of the Franklin Institute, Vol.ume 329, No. 2, pp. 259-271, 1992.

"The Effect Of Iq Mismatch Errors On Adaptive Cancellation." K. R. Gerlach, IEEE Trans. on Aerospace and Elec. Sys., Vol. 28, No. 3, pp. 729-740, July 1992.

"General Form And Properties Of Zero Cross-Correlation Waveforms." K. R. Gerlach and F. F. Kretschmer Jr., IEEE Trans. on Aerospace and Elec. Sys., Vol. 28, No. 1, pp. 98-104, January 1992.

"Space-Based Radar Coherent Processing During Scintillation: Vhf Through L-Band." D. L. Knepp and E. L. Mokole, Radio Science, Vol. 27, No. 1, pp. 47-61, January-February 1992.

"The Evolution Of Strategies For Multi-Agent Environments." J.J. Grefenstette, Adaptive Behavior, v1, n1, 65-89, Summer 1992.

"A Formal Analysis Of The Role Of Multi-Point Crossover In Genetic Algorithms." Kenneth A. De Jong and William M. Spears, Annals of Mathematics and Artificial Intelligence 5 (1), 1-26, J.C. Baltzer, AG Scientific Publishing Company, 1992.

"The Role Of Program Structure In Software Maintenance." Deborah A. Boehm-Davis, Robert W. Holt, and Alan C. Schultz, International Journal of Man-Machine Studies, (36), 21-63, 1992.

"Caenorhabditis Elegans: A Proposal To Simulate The Intelligence Of A Simple Animal." Ralph Hartley, Artificial Life III, June 15-19, 1992.

"Uncoded And Coded Performance Of Mfsk And Dpsk In Nakagami Fading Channels." P. Crepeau, IEEE Transactions on Communications, 40-3 pp. 487-493, March 1992.

"Multireception Probabilities For Fh/Ssma Communications." T. Ketseoglou and E. Geraniotis, IEEE Transactions on Communications, 40 pp. 223-233, January 1992.

"A Comparison Of Isdn And Lan Technologies For Shipboard Use." Randall Atkinson, Proceedings of the IEEE Military Communications Conference, October 1992.\*

"If A Tree Falls In The Woods...." David Mihelcic, Andrew Moore, Charles Payne, Mitre Workshop on Critical Software Assurance, September 1992.

"Data Dependence Analysis For An Untrusted Transaction Manager In A Multilevel Database System." Myong Kang, First International Conference on Information and Knowledge Management, 1992.

"A Practical Transaction Model And Untrusted Transaction Manager For A Multilevel-Secure Database System." Myong Kang, Sixth IFIP Working Conference on Database Security, 1992.

"Engineering Case Tools To Support Formal Methods For Real-Time Software Development." C. L. Heitmeyer, P. C. Clements, B. Labaw, and A. K. Mok, Proc., Fifth Intern. Workshop on Computer-Aided Softw. Eng., IEEE CS Press, Los Alamitos, CA, 1992.\*

"Aspects Of Direct Manipulation In Advanced Cockpits." J. Ballas, C. L. Heitmeyer, and M. Perez, Proc. CHI '92, ACM Conf. on Human Factors in Computing Systems, Monterey, CA, pp 127-134, May 3-7, 1992.\*

"A Logical Approach To Multilevel Security Of Probabilistic Systems." Gray, James W., III and Paul F. Syverson, Proceedings of the 1992 IEEE Computer Society Symposium on Security and Privacy, May 1992.\*

"Toward A Mathematical Foundation For Information Flo Security." James W. Gray, III, Journal of Computer Security, Vol. 1, no. 3, 1992.

"Proving Noninterference And Functional Correctness Using Traces." John McLean, The Journal of Computer Security, Vol. 1, no 1, Jan. 1992.

"Using Traces Based Upon Procedure Calls To Reason About Composability." Catherine Meadows, Proceedings of the 1992 IEEE Symposium on Research in Security and Privacy, May 1992\*

"Applying Formal Methods To The Analysis Of A Key Management Protocol." Catherine Meadows, The Journal of Computer Security, Vol. 1, no 1, Jan. 1992.

"Fundamental Questions About Formal Methods: Introduction to Panel Discussion." Catherine Meadows, Proceedings of the Computer Security Foundations Workshop V, June 1992.\*

"New Approaches to Database Security: Report on Discussion." Catherine Meadows, Research Directions in Database Security, Teresa Lunt, ed., 1992.

"Designing a Trusted Application Using an Object-Oriented Data Model." Catherine Meadows and Carl Landwehr, Research Directions in Database Security, Teresa Lunt, ed., 1992.

"Fifth Meeting of IFIP WG 11.3: Report on Discussion." Catherine Meadows, Database Security: Status and Prospects, IV, S. Jajodia and C. E. Landwehr, eds., 1992.

"A Classical Automata Approach to Noninterference Type Problems." Ira Moskowitz and Oliver Costich, Proceedings of the Computer Security Foundations Workshop V, June 1992.\*

"The Influence Of Delay Upon An Idealized Channel's Bandwidth." Ira Moskowitz and Allen Miller, Proceedings of the 1992 IEEE Symposium on Research in Security and Privacy, May 1992.\*

"Is Sensitive Dependence On Initial Conditions Nature's Sensory Device?." Ray Brown, Leon Chua, Becky Popp (Mahal), International Journal of Bifurcation and Chaos - World Scientific, Vol. 2, No. 1, pp. 193-199, March 1992.

"On The Visualization And Analysis Of Fluid-Structure Interaction From The Perspective Of Instantaneous Intensity." A. J. Romano, E. G. Williams, L. C. Schuette, K. L. Russo, Proceedings of the Second French Congress on Acoustics, Journal De Physique IV, Colloque C1, Suppl. No. 4, April, 1992.\*

"Determinacy Of Generalized Schema." Dr. Richard S. Stevens and Mr. David J. Kaplan, IEEE Transactions on Computers, Vol. 41, No. 6, pp 776 - 779, June 1992.

"3-D Reconstruction Of Small Underwater Objects Using High-Resolution Sonar Data." Rosenblum, L.J. and B. Kamgar-Parsi, Proc. Symposium on Autonomous Underwater Vehicles (AUV92), pp. 228-235, June 1992.\*

"Dynamical Stability And Parameter Selection In Neural Optimization." Behzad Kamgar-Parsi and Behrooz Kamgar-Parsi, Proc. International Joint Conference on Neural Networks (IJCNN '92), Baltimore, MD., Vol. 4, pp. 566-571, June 1992.\*

"Underwater Acoustic Imaging." L.J. Rosenblum, and B. Kamgar-Parsi and E.O. Belcher, IEEE Computer Graphics and Applications, Vol. 12, No.4, pp. 11-13, July, 1992.

"Reconstruction Of Underwater Objects From Acoustic Imaging Data." Behzad Kamgar-Parsi and L.J. Rosenblum, Proc. Undersea Defense Technology Meeting (UDT '92), London, UK, pp. 753-758, July 1992.\*

"Underwater Acoustic Imaging." Behzad Kamgar-Parsi, L.J. Rosenblum, and E.O. Belcher, IEEE Computer Graphics and Applications, July 1992, pp. 11-13, 1992.

"Simulations Of Acoustic Fields On A Massively Parallel Computer." S. K. Numrich, R.A. Krutar, D. B. Creamer, J. B. Cole, Proceedings of the 1992 Undersea Defense Technology Conference, July 1992 (refereed proceedings).\*

"Efficient Gating In Data Association With Multivariate Gaussian Distributed States." Joseph B. Collins and Jeffrey K. Uhlmann, IEEE Trans. Aero. Elec. Sys., August 1992.

"Clustering With The Hopfield Neural Networks," Behrooz Kamgar-Parsi and Behzad Kamgar-Parsi, Proc. Government Neural Network Application Workshop, Wright-Patterson AFB, OH, Vol. 1, pp. 129-135, August 1992.\*

"Algorithms For Multiple-Target Tracking." Jeffrey K. Uhlmann, American Scientist, Vol. 80, No. 2, 1992.

"A Mod Loc Vulnerability Assessment Tool." Jeffrey K. Uhlmann, Proceedings of the Conference on Command and Control Decision Aids, 1992.\*

"Classification Of Underwater Targets Using Bayesian Networks." Ranjeev Mittu, CISC '92 Conference Proceedings, 1992.\*

"On The Instantaneous Structural Intensity In A Thin Cylindrical Shell," A. J. Romano, E. G. Williams, L. C. Schuette, K. L. Russo, Proceedings of the 1992 International Congress on Noise Control Engineering, Vol., 1992.\*

"Quantization Error In Hexagonal Sensor Configurations." Behzad Kamgar-Parsi and Behrooz Kamgar-Parsi, IEEE Trans. Pattern Analysis and Machine Intelligence, Vol. 14, pp. 665-671, 1992.

"Surface Reconstruction (Of Rough Terrain) In Range Image Shadows," Behzad Kamgar-Parsi, P.J. Narayanan, and L.S. Davis, Pattern Recognition Letters, Vol. 13, pp. 657-667, 1992.

"Flow Visualization As A Basic Tool To Investigate The Dynamics And Topology Of Jets," F. F. Grinstein, U. R. Obeysekare, and G. Patnaik, Proceedings IEEE Computer Society Press Reprint, October 19-23, 1992.\*

"A Magnetoelastic Metallic Glass: Low Frequency Magnetometer," Mermelstein & Dandridge, IEEE Transactions on Magnetics/Pub l. Vol. 28, No. 1, AD 11/20/90, Ser 6570-8064, January 92.

"Diode Pumped Amplifier/Laser Using Leaky-Wave Fiber Coupling: An Evaluation": D. Cordray & P. Howerton, to be published in IEEE J. Quantum Electronics, Vol. 28, No. 4, Published in 1992, pp. 1081-1087, April 1992.

"Image Speckle Contrast Reduction Resulting From Integrative Synthetic Aperture Imaging." L. Sica, Applied Optics, Vol. 31, No January 1992.

"Short Wavelength Imaging Laser Radar Using A Digicon Detector," S. C. Hiser, G. L. Trusty, J. A. Blodgett, J. A. Welch, M. G. Roe, T. H. Cosden, G. Benedict-Hall, R. O. Ginaven, M. Khazra, E. Odeen, J. E. Page, N. E. Swanberg, and F. D. Feiock, Accepted for Publication in SPIE Optical Engineering. Published in 1992, Vol. 31, No. 11, pp. 2355-2365, November 1992

"Blue Light Generation By Freq. Doubling Of Alg Road Area Amplifier Emission." Goldberg and Busse, As Applied Physics Ltrs. Published, Vol.60, No. 9, March 1992.

"A Fiber Optic Ac Electric Field Sensor Based On The Electrostrictive Effect." Vohra, Bucholtz, Optics Letters, Published, Vol.17, No. 5, March 1992.

"Remote Fiber Optic Ac Magnetometer Electronics." A.Davis, Patrick, Dandridge, Bucholtz , Letters, Vol. 28, No. 3, p.271, January 1992.

"Fiber Optic Gyroscopes With Depolarized Light." Burns,Kersey, Vol.10, No.7, pp.992-999, July 92.

"High Resolution Fiber Grating Based Strain Sensor Electronics.W/Interferometric Wavelength Shift Detection." Kersey, Berkoff, Morey, Letters Published, Vol.28, p.236, Jan.1992.

"Low Crosstalk Code Div. Multiplexed Interferometric Array." Kersey, Dandridge, M.Davis, Elect. Letters, Published, Vol.28, No. 4, Feb. 1992.

"Optical Microwave Techniques & Applications." Goldberg,Esman,Williams, IEE proceedings journal, Published August 1992, Vol.139, No.4 , p. 288, 1992.

"Electrical Loss Mechanisms In Travel Wave Linbo3 Optical Modulators." Ganesh, Burns, Bulmer, Electronics Letters. Published, Vol.28, No. 2, January 1992.

"Optical Polarization Div. Multiplexing At 4 Gb/S." Hill, Olshansky, Burns, Photonics Tech. Ltrs.Published 1992 , Vol.4, p.500, 1992.

"F-Aggregate Color Centers In Sodium Doped Ki." I.Schneider Optics Letters, Vol.17, No.8, Published April 1992.

"Thermal Lensing Of Heavy Metal Fluoride Glasses." J. Jewell, and I. Aggarwal, published in Journal of Non-Crystalline Solids, Vol. 142, pp. 260-268, 1992.

"Sodium Fluoride Thin Films By Chemical Vapor Deposition." L. Lingg, A. Berry, A. Purdy, and K. Ewing, published in Thin Solid Films, Vol. 209(1), pp. 9-16, March 15, 1992.

"Radiotracer Study Of The Preparation Of High Purity Lanthanum Fluoride Via A Series Of Coprecipitation And Precipitation Reactions." K. Ewing, J. Jaganathan, L. Peitersen, I. Aggarwal, J. Sommers, J. Fahey, published in Journal of the American Ceramic Society, Vol. 75, No. 6, pp. 1562-1565, June 6, 1992.

"Raman Scattering Studies Of Microcrystalline Inclusions In Fluoride Glasses And Fibers." J. Freitas, J. Sanghera, U. Strom, P. Pureza, I. Aggarwal, published in Journal of Non-Crystalline Solids, Vol. 140 (1992), pp. 166-171, 1992.

"The Distribution Of Oxide In A Bed Of Thermally Decomposed  $ZrF_4 \cdot H_2O$  Used As A Sublimation Feedstock." K. Ewing, B. Wright, J. Jaganathan, I. Aggarwal, published in Journal of the American Ceramic Society, Vol. 75, No. 7, pp. 1918-1923, July 1992.

"2-Photon Absorption At 5ev In Zblan Glasses." J. Sanghera, T. Tsai, J. Jewell, J. Jaganathan, I. Aggarwal, published in Materials Letters, Vol. 13 , pp. 135-138, 1992.

"A Structural Model For Low-Silica Content Calcium Aluminosilicate Glasses." D. Dutt, P. Higby, D. Griscom, published in the Physics and Chemistry of Glasses, Vol. 33 , pp. 51-55, April 1992.

"Challenges In Obtaining Low-Loss Fluoride Glass Fibers." J. Sanghera, B. Harbison, I. Aggarwal, published in Journal of Non-Crystalline Solids, Vol. 140, pp. 146-149, 1992.

"An Electron Spin Resonance Study Of Gamma-Irrad." D. Dutt, D. Griscom, C. Shaw, J. Shelby, 1992.

"Permanent Photowritten Optical Gratings in Irradiated Silicate Glasses." G. Williams, D. Dutt, J. Ruller, E. Friebele, published in Optics Letters, Optical Society of America, Vol. 17, pp. 532-534, 1992.

"Electron Spin Resonance Characterization Of Self-Trapped Holes In Amorphous Silicon Dioxide." D. Griscom, published in Journal Non-Crystalline Solids, Vol. 149, pp. 137-160, 1992.

"Evidence Of Secondary Phase Separation In An Alkali Borosilicate Glass." J. Ruller, E. Friebele, published in Journal of the American Ceramic Society, Vol. 75, pp. 1026-1027, 1992.

"Model For The Thermo-Optic Behavior Of Sodium Borate And Sodium Aluminosilicate Glasses." J. Jewell, published in Journal of Non-Crystalline Solids, Vol. 142, pp. 145-153, 1992.

"Blue Light Generation By Frequency Doubling Of Algaas Broad Area Amplifier Emission." L. Goldberg, L. Busse, D. Mehuys, published in Applied Physics Letters, Vol. 60, No. 9, pp. 1037-1039, 1992.

"Properties And Morphology Of Sodium Lead Germanate Glasses." J. Ruller, C. Shaw, J. Shelby, published in Physics and Chemistry of Glasses, Vol. 33, No. 5, pp. 161-166, 1992.

"Properties Of Heavy Metal Oxide Glasses." J. Ruller, J. Shelby, published in Physics and Chemistry of Glasses, Vol. 33, No. 5, pp. 177-183, 1992.

"Photo-Induced Grating And Intensity Dependence Of Defect Generation In Ge-Doped Silica Optical Fiber." T. Tsai, C. Askins, E. Friebele, published in Applied Physics Letters, Vol. 61, pp. 390-392, 1992.

"Hydrogen Model For Radiation-Induced Interface States In SiO<sub>2</sub>-On-Si Structures: A Review Of The Evidence." D. Griscom, published in Journal of Electronic Materials, Vol. 21, pp. 763-767, 1992.

"Fiber Bragg Reflectors Prepared by A Single Excimer Pulse." C. Askins, T. Tsai, G. Williams, M. Bashkansky, E. Friebele, published in Optics Letters, 17, pp. 833-835, 1992).

"Infrared Reflectance of Ba-Gallogermanate Glasses." C. Merzbacher, published in Physics and Chemistry of Glasses, 33, pp. 233-238, 1992.

"H<sub>2</sub>O and HF Evolution from ZBLAN Glasses." J. Jewell, M. Sachon, I. Aggarwal, published in Materials Letters, 14, pp. 352-354, 1992.

"Materials Issues in Diagnostic Systems for BPX and ITER." F. Clinard, Jr., E. Farnum, D. Griscom, R. Mattas, S. Medley, F. Wiffen, S. Wojtowicz, K. Young, and S. Zinkle, published in J. Nucl. Materials, 191-194, pp. 1399-1403, 1992.

"The Effect of Materials Purity on the Absorption Coefficient of Fluoride Glasses." J. Jewell, G. Williams, J. Sanghera, J. Jaganathan, T. Tsai, and I. Aggarwal, published in Solid State Optical Materials, American Ceramic Society, Westerville, OH, pp. 403-413, 1992.



"Defect Centers and Photoinduced Self-Organization in Ge-Doped Silica Core Fiber." T. Tsai, D. Griscom, published in Photoinduced Self-Organization Effects in Optical Fibers, SPIE, Vol. 1516, pp. 14-28, 1992.

"Radiation-Induced Trapped Hole Centers in Calcium Aluminosilicate Glasses." D. Dutt, P. Higby, C. Merzbacher, and D. Griscom, published in the American Ceramic Society, Westerville, OH, Ceramic Transactions, Vol. 28, pp. 111-122, 1992.

"Characterization of CuCl Microcrystals in a Glassy Matrix." J. Ruller, G. Williams, and E. Friebele, published in the American Ceramic Society, Westerville, OH, Ceramic Transactions, Vol. 28, pp. 499-505, 1992 .

"Correlation of Radiation Response and Fiber Fabrication Parameters." E. Friebele, C. Askins, M. Putnam, C. Harrington, M. Gingerich, published in the American Ceramic Society, Westerville, OH, Ceramic Transactions, Vol. 28, pp. 539-543 1992.

"Gallogermanate Glasses as NIR Optical Waveguides." P. Higby, C. Merzbacher, I. Aggarwal, E. Friebele, published in Optical Waveguide Materials, MM Broer, Ed., Materials Research Society, Pittsburgh, PA, Vol. 244, pp. 115-120, 1992.

"ESR Spectroscopic Investigation of Oxide-doped Fluorozirhafnate Glasses." J. Sanghera, D. Griscom, P. Hart, M. Sachon, I. Aggarwal, published in Ceramic Transaction, Vol. 28 (Solid State Optical Materials), pp. 423-431, 1992.

"Materials Effects on the Radiation Sensitivity of Single Mode Optical Fibers. II." E. Friebele, C. Askins, M. Putnam, C. Harrington, M. Gingerich, W. Schmidt, published in Optical Waveguide Materials, MM Broer, Ed., Materials Research Society, Pittsburgh, PA., Vol. 244, pp. 39-44, 1992.

"Permanent Photoinduced Refractive Index Changes in Rare Earth Doped Glasses." G. Williams, J. Ruller, E. Friebele, published in Optical Waveguide Materials, MM Broer, Ed., Materials Research Society, Pittsburgh, PA., Vol. 244, pp. 59-64, 1992.

"Pulse Energy Dependence of Defect Generation in Bragg Grating Optical Fiber Materials." T. Tsai, C. Askins, E. Friebele, published in Optical Waveguide Materials, MM Broer, Ed., Materials Research Society, Pittsburgh, PA., Vol. 244, pp. 47-58, 1992.

"Electron Spin Resonance Characterization of Nonbridging Oxygen-Hole Centers in Alkali Silicate Glasses." R. Cases, D. Griscom, published in the Boletín de la Sociedad Espanola de Ceramica y Vidrio, Proc. XVI International Conference on Glass, Vol. 3, pp. 53-58, 1992.\*

"Single Pulse Formation of Fiber Bragg Gratings." M. Bashkansky, E. Friebele, C. Askins, T. Tsai, G. Williams, M. Putnam, published in "Fiber Optic Sensor-Based Smart Materials and Structures, R.O. Claus, Ed (IOP Publishing, Philadelphia, PA), pp. 85-88, 1992.

"Radiation Effects in Polarization-Maintaining Fibers." E. Friebele, M. Gingerich, C. Harrington, J. Onstott, published in the Proc. Workshop on Fiber Optics for Missile Applications, US Army Missile Command Report RD-AS-92-34, pp. V2-8, 1992.\*

E. Friebele, M. Gingerich, "Radiation Effects in Bend-Resistant Optical Fibers." published in the Proc. Workshop on Fiber Optics for Missile Applications, US Army Missile Command Report RD-AS-92-34, pp. IV2-8, 1992.\*

"Radiation Effects in Erbium-Doped Optical Fibers." G. Williams, M. Putnam, C. Askins, M. Gingerich, E. Friebele, published in the Proc. Workshop on Fiber Optics for Missile Applications, US Army Missile Command Report RD-AS-92-34, pp. II13-20, 1992.\*

"Radiation Effects in Erbium-Doped Optical Fibers." G. Williams, M. Putnam, C. Askins, M. Gingerich, E. Friebele, published in the Electronics Letters, 28, pp. 1816-1817, 1992.

"400MW of Blue Light Generated by Frequency Doubling of AlGaAs Broad Area Amplifier Emission." L. Goldberg, L. Busse, M. Chun, D. Mehuys, Conference on Lasers and Electro-Optics Technical Digest, Vol. 12, pp. 526-527, 1992.

"High Temperature Epitaxy Of Diamond In A Turbulent Flame." K. Snail, C. Marks, C. Vol.d, and J. Freitas, for publication in Diamond & Related Materials Technology, Vol. 1, P. 180, 1992, 1992.

"Cvd Diamond Nucleation Induced By Sp<sup>2</sup> Carbon On Unscratched Silicon," P. Pehrsson, J. Glesener, and A. Morrish, for publication in Thin Solid Films, VOL. 212, P. 81, 1992.

"Optical and Electrical Characterization of Magnesium-Doped Bismuth-Substituted Lutetium Iron Garnet Thin Films." J.C. Butler, J.J. Kramer, J.N. Lee, J.B. Ings, and R.F. Belt, published in Journal of Appl. Phys., pp. 925-928, 15 January 1992.

"Micro Pattern Transfer Using Diamond," J. Glesener and R. J. Tonucci, , submitted to Appl. Phys. Lett., Sept. 1992.

"Electron Beam Modification Of Schottky Diode Characteristics Of Diamond," J. Glesener, A. Morrish, and K. Snail, Vol. 61, p. 429-431, Appl. Phys. Lett., May 92.

"In Situ Diamond Growth Rate Measurement Using Emission Interferometry," K. Snail and C. Marks, Appl. Phys. Lett. Vol. 60, 3135, 1992.

"Diode Pumped Amplifier/Laser Using Leaky-Wave Fiber Coupling: An Evaluation," D. Cordray & P. Howerton, to be published in IEEE J. Quantum Electronics. Vol. 28, No. 4, pp. 1081-1087, April 1992.

"Image Speckle Contrast Reduction Resulting from Integrative Synthetic Aperture Imaging," L. Sica, Applied Optics, Vol. 31, No 1, pp. 120-125, January 1992.

"Laser Ranging Countermeasure Program Acceptance Test," R. Cunningham, D. M. Cordray, J. Haggerty, to be published in the Proceedings of the 1992 IRIS IRCM by ERIM, Vol. 11, Pp. 387-407, 1992.\*

"Short Wavelength Imaging Laser Radar Using A Digicon Detector," S. C. Hiser, G. L. Trusty, J. A. Blodgett, J. A. Welch, M. G. Roe, T. H. Cosden, G. Benedict-Hall, R. O. Ginaven, M. Khazra, E. Odeen, J. E. Page, N. E. Swanberg, and F. D. Feiock, Accepted for Publication in SPIE Optical Engineering. Published In 1992, Vol. 31, No. 11, pp. 2355-2365, November 1992,

"Low-Light-Level, Quantum-Noise-Limited Amplification In A Stimulated Raman Amplifier," M. Duncan, R. Mahon, L. Tankersley, J. Reintjes, JOSA B, 9, 11, p. 2107, 1992.

"A Simple Technique to Prevent Misfire Arcing in Discharge-pumped Excimer Lasers." M. Bashkansky and B. Wexler, Rev. Sci. Inst. 63, pp. 1838-1839, 1992.

"Ar<sub>2</sub> Excimer Emission From A Pulsed-Discharge-Exited Pulsed Supersonic Gas Jet." J. Tucker, M. Masters, B. Wexler, and S. Searles, Opt. Lett. 17, pp. 288-290, 1992.

"Fiber Bragg Reflectors Prepared By A Single Excimer Pulse." C. Askins, T-E Tsai, G. Williams M. Putnam, M. Bashkansky, and J. Friebele, published in Opt. Letters, Vol. 17, No. 11, p. 833, 1992.

"Threshold Reduction For Stimulated Brillouin Scattering Using A Multipass Herriott Cell." M. Duignan, B. Feldman and W. Whitney, published in JOSA B, Vol. 9, pp 548-559, 1992.

"Sbs Phase Conjugation Of An Amplified Hydrogen Fluoride Laser Beam" W. Whitney, M. Duignan and B. Feldman, published in Applied Optics, Vol. 31, pp. 600-702, 1992.

"Gas Scavenging of Insoluble Vapors: Condensation of Methyl Salicylate Vapor onto Evaporating Drops of Water." M. Seaver and J. Peele, published in Atmospheric Environment, Vol. 26A No. 2, pp. 205-209, 1992.

"Evaporation Kinetics of Ventilated Waterdrops Coated with Octadecanol Monolayers." M. Seaver, J. Peele, T. Manuccia, G. Rubel and G. Ritchie, published in Journal of Physical Chemistry, July 23, pp.6389-6394, 1992.

"Passive Stabilization Of Photorefractive Two-Beam Coupling With Laser Diodes Using Achromatic Grating Techniques." W. Rabinovich, C. Gilbreath, A. Clement and B. Feldman, published in Optics Communications 93, pp156-162, 1992.

"Comparison Of Photorefractive Beam Fanning Using Monochromatic And Achromatic Two-Wave Mixing In Sbn." C. Adler, W. Rabinovich, A. Clement, G. Gilbreath, and B. Feldman, published in Optics Communications, 92, pp. 609-618, 1992.

"Optical Vortex Solitons Observed In Kerr Nonlinear Media." G. Swartzlander and C Law, published Phys. Rev. Lett. 69, pp. 2503-2506, 1992.

"CW Stimulated Raman Scattering in Microdroplets," H-B Lin, A. Campillo and J. Eversole, published in Optics Letters, Vol. 17, pp. 828-830, 1992.

"Spectral Properties of Lasing Microdroplets," A. Campillo, H-B Lin, and J. Eversole, published in JOSA B, Vol. 9, pp. 43-50, 1992.

"Cavity Mode Identification of Fluorescence and Lasing in Micro-Droplets." H-B Lin, A. Campillo and J. Eversole, published in Applied Optics, Vol. 31, pp 1982-1991, 1992.

"Cavity Quantum Electrodynamics Enhancement of Spontaneous and Stimulated Emission in Microdroplets," A. Campillo, H-B Lin, and J. Eversole, published in Modern Physics Letters B, Vol. 6. pp. 447-457, 1992.

"Microdroplet Resonant Emission Structure," H-B Lin, A. Huston J. Eversole and A. Campillo, published in Optics Letters, Vol. 17, pp. 970-972, 1992.

"Cavity-modified Spontaneous emission Rates in Liquid Microdroplets," H-B Lin, J. Eversole, C. Merritt and A. Campillo, published in Phys. Rev. A, Vol. 45, pp. 6756-6760, 1992.

"Dark Soliton Prototype Devices: Analysis Using Direct Scattering Theory," G. Swartzlander, published in Optics Letters, Vol. 17, pp. 493-495, 1992.

"Nanochannel Array Glass," R. Tonucci, B. Justus, and A. Campillo, published in Science, Vol. 258, pp. 783-785, 1992.

"Nonlinear Optical Properties Of Quantum Confined Gaas Nanocrystals In Vycor Glass," B. Justus, R. Tonucci and A. Berry, published in Applied Phys. Lett, Vol. 61, pp. 3151-3153, 1992.

"Quantum Limited Imaging In A Stimulated Raman Amplifier And Applications In Time-Gated Imaging Through Scattering Media," M. Duncan, The International Society for Optical Engineering 1992 Symposium (SPIE OE LASE 92), paper 1626-38, Jan. 19-24, Los Angeles, CA, 1992.

"New Narrowband Filters," B. Wexler, and T. Colbert, invited paper presented at Lasers '91, San Diego, CA Dec. 991. Paper published in Proceedings of International Conference on Lasers '91 (STS Press, McLean, VA) pp. 236-243 published in 1992.\*

"Intense Excimer Vuv Emission From Discharge Pumped Supersonic Jets" Presented At Leos," M. Masters, J. Tucker, B. Wexler and S. Searles, 92 Conf. Nov. 16-19, Boston, MA and published in conference Proceedings, page #72, 1992.\*

"Imaging through a Strong Scattering Medium Using Nonlinear Optical Field Cross-Correlation Techniques," M. Bashkansky and J. Reintjes, published in conf. Proceedings from the Photon Correlation and Scattering conf., Aug. 24-26, Univ. of Colorado at Boulder, Vol. 20, pp 25-28, 1992.\*

"Imaging Through Scattering Media Using a Raman Amplifier," J. Reintjes, M. Duncan, R Mahon. L. Tankersley and M. Bashkansky, presented at the LEOS '92 Conf. Nov. 16-19, Boston, MA and published in conf. Proceedings, 1992.\*

"Cavity QED Enhanced Spontaneous and Stimulated Emission in Liquid Droplets," A. Campillo, H-B Lin, J. Eversole, published in SPIE conf. Proceedings Vol. 1726, pp 59-64, 1992.\*

"Nanometer Array Glass Technology for Quantum Dot and Quantum Wire Applications," IR. Tonucci, B. Justus and A. Campillo, QEC Tech. Digest Series 2, 60, 1992.

"Refractive Nonlinear Optical Power Limiters," A. Campillo, B. Justus, A. Huston and G. Swartzlander, Proc. of First DOD Workshop on Liquid Cell Limiters, G. Mueller, ed., Vol. 1, G-1, 1992. \*

"Large. Weakly-Saturating Third Order Nonlinear Susceptibilities in Semimetals and Narrow-Gap Semiconductors," E. Youngdale, J. Meyer, F. Bartoli, and C. Hoffman, International Journal of Nonlinear Optical Physics, Vol. 1, No. 3, 493-531, World Scientific, 1992.

"Magnetic Generation of Electrons and Holes in Semimetallic HgTe-CdTe Superlattices," J. Meyer, C. Hoffman, F. Bartoli, et. al, for publication Journal Vac. Sci. and Tech. B 10(4) 1582, 1992.

"Nonlinear Optical Properties of InSb<sub>1-x</sub>As<sub>x</sub>-Based Alloys and Superlattices," E. Youngdale, J. Meyer, C. Hoffman, and F. Bartoli, Journal Vac. Sci. Technol. B 10, 885, 1992.

"Quantum Hall Effect In HgTe-CdTe Superlattices with Strong Three Dimensional Dispersion," C. Hoffman, J. Meyer and F. Bartoli, Journal Vac. Sci. Technol. B 10(2), p. 905, Mar/Apr 1992.

- "Direct Upper-State Resonant Pumping Of The 2.8 $\mu$ M Er<sup>3+</sup>:Yif Laser." R. Stoneman, J. Lynn and L. Esterowitz, Journal Quantum Elecs. Vol. 18, No. 4 p. 1041, 4 Apr 1992.
- "Free Carrier Transport In Superlattices - Smooth Transition Between The Quasi-2d And Uniform 3d Limits," J. Meyer, D. Arnold, C. Hoffman and F. J. Bartoli, Phys. Rev. B, 45, 1295, 1992.
- "Gold Cluster-Laden Polydiacetylenes: Novel Materials for Nonlinear Optics." A. Olsen and Z. Kafafi, J. Am. Chem. Soc. 113, 7758, Society Journal," ACS, 1992.
- "Third Order Optical Non-linearities of Bis-Phthalocyanines," J. S. Shirk, J. R. Lindle, F. J. Bartoli and M. E. Boyle, Journal Phys. Chem. 96 5847, 1992.
- "Setback Modulation Doping of HgTe-CdTe Multiple Quantum Wells," C. A. Hoffman, J. R. Meyer, F. J. Bartoli et al, Appl. Phys. Letts. 60, 2202, 1992.
- "Comment on Large Infrared Nonlinear Optical Response of C<sub>60</sub>," Z. H. Kafafi, F. J. Bartoli, J. R. Lindle and R. G. S. Pong, Phys. Rev. Lett. 68, 2705, 1992.
- "Continuous-Wave Modelocked 2 $\mu$ m Laser," J. F. Pinto and L. Esterowitz, Optics Letts., Vol. 17, No. 10, p.731, 15 May 1992.
- "Electron and Hole In-Plane Mobilities in HgTe-CdTe Superlattices," J. R. Meyer, D. J. Arnold, C. A. Hoffman and F. J. Bartoli and L. R. Ram-Mohan, Phys. Rev. B. Vol. 46, No.7, p. 46, 15 Aug 1992.
- "Off-Resonant Nonlinear Optical Properties of C<sub>60</sub> Studied by Degenerate Four-wave Mixing," Z. Kafafi, J. Lindle, R. Pong, F. Bartoli, L. Lingg and J. Milliken, Chem. Phys. Lett.. 188, 492, 1992.
- "HgTeCdTe Superlattices for IR Detection Revisited," J. R. Meyer, C. A. Hoffman et all, Appl. Phys. Letts. 61, 1814, 1992.
- "Even Length Median Filters in Optimal Signal Processing," J. P. Havlicek, G. R. Katz and J. McKeeman, Elec. Letts. Vol. 28, No. 13. p. 1258, 18 June 1992.
- "Efficient Resonantly-Pumped 2.8- $\mu$ M Er<sup>3+</sup>:Gsgg Laser," R. C. Stoneman and L. Esterowitz, Optics Letts., Vol. 17, No. 11 p. 816, 1 June 1992.
- "Intracavity-Pumped 2.09- $\mu$ M Ho:Yag Laser," R. C. Stoneman and L. Esterowitz, Optics Letts., Vol. 17, No. 10 p. 736, 15 May 1992.
- "Auger Recombination In HgCdTe Quantum Wires And Quantum Boxes," J. R. Meyer, Y. Jiang, M. C. Teich and W. I. Wang, Journal Appl. Phys. 71, 3394, 1992.
- "Quantum Hall Effect And Setback Modulation Doping In HgTe-CdTe Heterostructures," C. A. Hoffman, J. R. Meyer and F. J. Bartoli, Journal Vac. Sci. Technol. B 10, 1638, 1992.
- "Third Order Nonlinear Optical Properties of Metallo-Phthalocyanines," J. Shirk, J. Lindle, F. Bartoli, Z. Kafafi, A. Snow and M. Boyle, Int'l Journal of Nonlinear Optical Physics, Vol. 1, No. 4, 699-726, 1992.

"Third Order Optical Properties of Square-Planar Transition Metal Complexes in the Visible and Near-Infrared." Z. H. Kafafi, J. R. Lindle, Steven R. Flom, C. S. Weisbecker, R. C. Claussen and F. J. Bartoli, SPIE, Los Angeles, CA (Jan 92), SPIE 1626, 440, 1992.

"Reduction of Acoustic Transients Generated in Liquid Media and In Tissue by Pulsed 2 $\mu$ m Lasers." T. Sedlacek, M. A. Martinelli, L. Esterowitz and J. Pinto, SPIE/OE LASE 92, Los Angeles, CA, Jan 1992.

"Generation of Tactical Missile Plume and Hardbody Spatial Infrared Imagery for Laser Countermeasure Aimpoint Selection," M. R. Pauli, T. Smith, P. Markarian, R. Yurman and R. Ambrusco, IRIS meeting, Orlando, FL, Jan 1992.

"Upconversion Losses in Flashlamp Pumped Cr:TM:YAG," S. R. Bowman, G. J. Quarles and B. J. Feldman, Advanced Solid State Lasers Conference, Santa Fe, NM (Feb 92), OSA Proceedings of ASSL 1992, Vol. 13, p. 169, 1992.\*

"Intracavity-pumped 2.1 $\mu$ m Ho<sup>3+</sup>:YAG Laser," R. C. Stoneman and L. Esterowitz, Advanced Solid State Lasers Conference, Santa Fe, NM, Feb 1992.

"Crystal Growth and Spectroscopic Properties of U<sup>3+</sup>:YLF<sub>4</sub>," G. J. Quarles, L. Esterowitz, G. Rosenblatt, R. Uhrin & R. Belt, Advanced Solid State Lasers Conference, Santa Fe, NM (Feb 92), OSA Proceedings of ASSL 1992, Vol. 13, p. 306, 1992.\*

"Disordered Oxide Crystals as Hosts for Diode Pumped Lasers," G. J. Quarles, L. Esterowitz, M. Randles, J. Creamer & R. Belt, Advanced Solid State Lasers Conference, Santa Fe, NM (Feb 92), OSA Proceedings of ASSL 1992, Vol. 13, p. 318, 1992.\*

"Continuous Wave Modelocked 2 $\mu$ m Laser," J. F. Pinto, G. Rosenblatt and L. Esterowitz, Advanced Solid State Lasers Conference, Santa Fe, NM (Feb 92), OSA Proceedings of ASSL 1992, Vol. 13, p. 91, 1992.\*

"Imaging Metrics for IRFPA's," D. A. Scribner, J. T. Caulfield, M. R. Kruer, and K. A. Sarkady, SPIE OE/Aerospace Sensing Conference, Orlando, FL, Apr 1992.

"Nonlinear Optical Properties of Narrow-Gap Type-II Superlattices," E. R. Youngdale, J. R. Meyer, C. A. Hoffman and F. J. Bartoli, CLEO/QELS Conference, Anaheim, CA (May 92) and publication in Proceedings, 1992.\*

"Cascade Thulium Fiber Laser," R. Allen, L. Esterowitz and I. Aggarwal, CLEO/QELS '92 Conference, Anaheim, CA (May 92) and publication in Proceedings, 1992.\*

"Passively-Tuned Tm<sup>3+</sup>:YALO Laser," R. Stoneman and L. Esterowitz, CLEO/QELS '92 Conference, Anaheim, CA (May 92) and publication in Proceedings, 1992.\*

"The Nonlinear Optical Response of Carotenoporphyrins," J. S. Shirk, J. R. Lindle, S. R. Flom and F. J. Bartoli et al, CLEO/QELS '92 Conference, Anaheim, CA (May 92) and publication in Proceedings, 1992.\*

"Susceptibility of PB InSb FPA's to Frequency Doubled CO<sub>2</sub> Laser Irradiation," C. A. Hoffman, F. J. Bartoli, J. R. Lindle and E. R. Youngdale, 30th IRIS Symposium on IRCM, JHU APL, Laurel, MD (May 92) and publication in Proceedings, 1992.\*

"Degradation of IRFPA Performance due to Optical Overload." J. T. Caulfield, C. J. Gridley, K. A. Sarkady and M. R. Kruer, 30th IRIS Symposium on IRCM, JHU APL, Laurel, MD (May 92) and publication in Proceedings, 1992.\*

"Comparison of Single-band and Dual-band MWIR Staring Missile Warning Systems." M. R. Pauli and G. R. Katz, 30th IRIS Symposium on IRCM, JHU APL, Laurel, MD (May 92) and publication in Proceedings, 1992.\*

"Performance and Stability Measurements on Several Large Area Staring IRFPA's." K. A. Sarkady, J. T. Caulfield, D. A. Scribner and M. R. Kruer, IRIS Specialty Group on Infrared Detectors, NASA AMES Research Center, Moffett Field, CA (Aug 92) and publication in Proceedings, 1992.\*

"Real-time Implementation of Adaptive Nonuniformity Correction for IR Focal Plane Arrays." D. A. Scribner, K. A. Sarkady, J. T. Caulfield, J. D. Hunt, and M. R. Kruer, IRIS Specialty Group on Infrared Detectors, NASA AMES Research Center, Moffett Field, CA (Aug 92) and publication in Proceedings, 1992.\*

"Susceptibility of Monolithic PtSi Focal Plane Arrays to Frequency Doubled CO<sub>2</sub> Laser Irradiation." C. A. Hoffman, F. J. Bartoli, J. R. Lindle and E. R. Youngdale, IRIS Specialty Group on Infrared Detectors, NASA AMES Research Center, Moffett Field, CA (Aug 92) and publication in Proceedings, 1992.\*

"Spectroscopic Characterization of Nd-Doped SrGdGa<sub>3</sub>O<sub>7</sub> as a Diode Pumped Laser Host." G. J. Quarles, L. Esterowitz, Gregg Rosenblatt et al, Solid State Lasers III, SPIE Vol. 1627, 1992.

"Crystal Growth and Spectroscopic Properties of U<sup>3+</sup>:LiYF<sub>4</sub>." G. J. Quarles, L. Esterowitz, G. Rosenblatt, R. Uhrin & R. Belt, OSA Proceedings on Advanced Solid State Lasers, Vol. 13, p.306, 1992.

"Recent Results of IRFPA Susceptibility to Laser CM." C. A. Hoffman, F. J. Bartoli, E. R. Youngdale and J. R. Lindle, 8th DoD Conference on DEW Vulnerability, Survivability and Effects, Naval Training Center, San Diego, CA (Jun 92) and publication in Proceedings, 1992.\*

"Observation Of Photodetector Nonlinearities." Williams, Esman Electronics Letters, Publ., V.28, #8, Apr. 1992.

"Reflectometric Two-Mode Elliptical-Core Fiber Strain Sensor." Berkoff, Kersey, Electronics Letters, V.28, #6, Publ, March 1992.

"Large Signal Switching Charact. Of A Pseudomorphic AlGaAs/InGaAs Modfet on a picosecond time scale." Frankel, et. al Applied Physics Ltrs., Publ. Sept. 92, Vol.61, 1992.

"Magnetic Sensors." Bucholtz, Proceedings/DOD F.Optics 92, March 24-27, McLean, VA, 1992.\*

"21 W Broad Area Near-Diffraction Limited Semiconductor Amplifier." Goldberg, Mehuys, Applied Physics Letters, Publ. V.61, #6, p. 633, Aug. 1992.

"Lateral Temp. Profiling In Broad-Area Diode Lasers & Amplif.Using A Photoluminescence Microprobe." Hall, Goldberg, Applied Physics Letters, Vol. 61, #4, p. 384, July 1992.

"Perf. & Modeling Of Proton Exchanged Litao<sub>3</sub> Branching Modulators." Moeller, Burns, Howerton, Journal of Lightwave Tech., Pub., Vol.10, Oct. 1992.

"Broadband Traveling Wave Phase & Amplitude Modulators For Photonics Applications." Bulmer, Ganesh, Greenblatt PSAA-91, Symp. Proceedings, Publ Apr. 1992.\*

"35 Ghz Metal-Semiconductor-Metal Photodetectors On Crystalline Silicon." Chou, Liu, Carruthers, Applied Physics Ltrs., Pub., Vol. 61, p.1760, 1992.

"Optoelectronic Transient Characterization Of Ultrafast Devices." Frankel, Whitaker, Mourou, IEEE J. Quantum Elect, Vol. 28, Publ. Oct. 1992.

"40 Ghz. Low V $\pi$  Ti:Linbo<sub>3</sub> Intensity Modulator." Ganesh, Bulmer, Burns, McElhanon, Greenblatt, Electronics Letters, Vol. 28, #9, p.826-827, Apr. 1992.

"3.3 Watt Cw Diffraction Limited Broad Area Semicond. Amplifier." Goldberg, Mehuys, Hall, Electronics Letters, Publ. June 92, Vol. 28, #12, p. 1082, 1992.

"Dual Wavelength Fiber Interferometer W/Wavelength Selection Via Fiber Bragg Grating Element." Kersey, Berkoff, Elect. Letters, Publ. June 1992, Vol. 28, #13, p. 1215, 1992.

"Single Polarization Fiber Amplifier." Duling, Esman, Electronics Letters LG 4/16/92, Publ. June 92, Vol. 28, #12, p.1126, 1992.

"Fiber Optic Bragg Grating Strain Sensor W/Drift Compensated High Resolution Interfer. Wavelength Shift Detection." Kersey, Berkoff, Optics Letters, Publ. Vol. 18, p.72, 1992.

"Use Of A Doubly Polarized Laser For Remote Powering Of An Integrated Optical Modulator." Howerton, Bulmer, Moeller, Burns, Photonics Tech. Ltrs., Vol. 4, Publ. Oct. 1992.

"Observation Of Stochastic Resonance Near A Subcritical Bifurcation." Vohra, Bucholtz, Journal of Statistical Physics, Vol. 70, #1,2, Publ. Jan. 1992.

"Integration Of Low Temperature Gaas On Si Substrates." Frankel, Tadayon, Carruthers, H. Dietrick, Applied Physics Ltrs., Vol. 62, Publ. Jan. 1992.

"Fiber Optic Bragg Grating Differential Temperature Sensor." Kersey, Berkoff, Photonics Technology Letters, Publ. Vol. 4, p.1183, 1992.

"High Repetition Rate Figure Eight Laser W/Extracavity Feedback." M.Dennis, I.Duling, Electronics Letters, Pub. Vol. 28, #20, p.1894, Sept. 1992.

"Elim. Of Coherent Rayleigh Backscatter Induced Noise In Fiber Michelson Interfer." Marrone, Kersey, Villarruel, Electronics Ltrs., Sept. 92, Vol. 28, #19, 1992.

"Fiber Optic Two Beam Interfer. Fringe Amplitude Recovery Using Laser Frequency Control." R.Weis, A.D.Kersey, M.J.Marrone, Applied Optics, PUBL. June '92, Vol. 31, #16 p.2964, 1992.

"2.0 CW diffraction limited tapered amplif. w/diode injection." D.Mehuus, D.Welch, & L. Goldberg, Electronic Letters, Publ. Oct. 92, Vol. 28, #21, 1992.

"Low Freq. Electrostrictiv E Ceramic Plate Vol. Tage Sensor." M.Mermelstein, S.Vohra, Electronics Ltrs, Publ. Sept. 92, Vol. 28, #20, p.1930, 1992.



"Microwave True-Time Delay Modulator Using Fiber Optic Dispersion." Esman, Monsma, Dexter, Cooper, Electronics Letters, Publ. Sept. 92, Vol. 28, #20, p.1905, 1992.

"Er-Doped Fiber Ring Laser Strain Sensor." A.Kersey, E.J.Friebele, R.S.Weis, F.O. Smart, Proceedings, Struct./SPIE, Vol. 1798, 1992.\*

"Two Channel Fiber-Bragg Grating Strain Sensor W/High Resolution Interferometric Wavelength Shift Detection Structures." A.Kersey, T.Berkoff, F.O. Smart, W.W.Morey, Proceedings, SPIE Vol. 1798, 1992.\*

"Optically Induced Absorption and Paramagnetism in Lead Lanthanum Zirconate Titanate Ceramics." W. Warren, C. Seager, D. Dimos, and E. Friebele, Appl. Phys. Lett. 61 (21) 2530-2532, 1992.

"Growth, Processing And Properties Of Cvd Diamond For Optical Applications." K. A. Snail, Optical Materials Vol. 1, p. 235, #4, 1992.\*

"Third Order Nonlinear Optical Properties of Metallo-Phthalocyanines." J. Shirk, J. Lindle, F. Bartoli, Z. Kafafi, A. Snow and M. Boyle, Int'l Journal of Nonlinear Optical Physics, Vol. 1, No. 4, 699-726, 1992.

"Methods for Magneto-Transport Characterization of IR Detector Materials." J. R. Meyer, C. A. Hoffman, F. J. Bartoli and D. Arnold, S. Sivananthan and J. P. Faurie, Workshop on Measurement Techniques for Characterization of HgCdTe Materials, Processing, and Detectors, Danvers, MA (Oct 92) and published in Book Chapter, 1992.\*

"Picosecond 2 $\mu$ m Tm:YAG Laser." J. F. Pinto, G. Rosenblatt and L. Esterowitz, for publication Solid State Lasers, Vol. 4, 1992.

"Magnetic Field Switching of Cylindrical Magnetron Sputtering Rates for Coating Glass Fibers & Rods." Z. Yu, L. Li, B. Shi, J. Meyer, B. Harbison, I. Aggarwal, for Japanese Journal of Applied Physics, Vol. 31, pp 3969-3971, 1992.

"The Functional Recognition/Response Program." Leo W. Lemley, Journal of Defense Research, Vol. 21 No. 3, pp. 661-679, July 1992.

"Over-the-Horizon Radar ECM." J. G. Constantine, D. Howard, M. Asbery and D. Mann, Journal of Defense Research by Battelle for DARPA, Vol. 21, No. 4, pp. 921-986, September 1992.

"Tactical Proforma Signal Exploitation." A. M. Findlay, J. G. Crnkovich, L. Ruffin, and D. Chau, Journal of Defense Research , Vol. 21, No. 3, pp. 715-739, June 1992.

"Stochastic Stability and Bifurcation Analysis of Non-linear Gated Range Trackers." R.E. Gover, E.H. Abed, A.J. Goldberg, Proceedings of the First World Congress of Non-linear Analysis, August 1992.\*

"Stochastic Theory and Adaptive Control." Duncan and Pasik-Duncan (Eds.), Lecture Notes in Control and Information Sciences 184, Springer-Verlag, pp 225-239, 1992.

"Stochastic Stability Analysis of Nonlinear Gated Range Trackers." R.E. Gover, E.H. Abed, A.J. Goldberg Optical Engineering, Vol. 31-No.11, pp 2355-2365, November 1992.

"Short Wavelength Imaging Laser Radar Using a Digicon Detector." S.C. Hiser, etal, Optical Engineering  
Nov 92, Vol. 30-No.11, 1992.

"An Automated Device for Quantitative Measurements of JFTOT Tube Deposits by Interferometry." R.E. Morris  
in ASTM STP 1138, P.W. Kirlin and P. David, ed., pp. 151-163, 1992.

"Caveats in Testing for Drugs of Abuse," D.A. Kidwell, in Methodological Issues in Epidemiological, Prevention and Treatment Research on Drug Exposed Women and Their Children, National Institute on Drug Abuse Monograph #117, M.M. Kilbey and K. Asghar, eds., (U.S. Government Printing Office), 1992.

"Development of a Jet Fuel Thermal Stability Flow Device Which Employs Direct Gravimetric Analysis of Both Surface and Fuel Insoluble Deposits," D.R. Hardy, E.J. Beal, J.C. Burnett, in ASTM STP 1138, P. Kirklin and P. David, eds., pp. 138-150, 1992.

"Diamond Chemical Vapor Deposition," F.G. Celii, J.E. Butler, in Annu. ReVol. Phys. Chem., R. Davis, ed., 42, 643, 1992.

"Force Microscopy," N.A. Burnham, R.J. Colton, in Scanning Tunneling Microscopy - Theory and Application, D.A. Bonnell, ed., (VCH Publishers, Inc), 1992.

"Formation and Reactivity of Silicon Carbide Cluster Cations," D.C. Parent, in Physics and Chemistry of Finite Systems: From Clusters to Crystals, Vol. II, 1131-1136, (Kluwer Academic Publishers), 1992.

"Formation and Characterization of C<sub>60</sub>He<sup>+</sup>," M.M. Ross, J.H. Callahan, in Physics and Chemistry of Finite Systems: From Clusters to Crystals, Vol. II, 1359-1364, (Kluwer Academic Publishers), 1992.

"Hair Analysis: Techniques and Potential Problems," D.A. Kidwell, D.L. Blank, in Recent Developments in Therapeutic Drug Monitoring and Clinical Toxicology, I. Sunshine, ed., (Marcel Dekker, Inc.), Chap. 81, 555, 1992.

"Kinetic Studies of Boron and Aluminum Species," N.L. Garland, in Gas-Phase Metal Reactions, p. 73-91, A. Fontijn, ed., (Elsevier Science Publishers ), 1992.

"Marine Coatings," R.F. Brady, Jr., R.W. Drisko, in Kirk-Othmer Encyclopedia of Chemical Technology, 4th Ed., (John Wiley & Sons, Inc.), 1992.

"Molecular Dynamics Simulations of Shock-Induced Chemistry: Application to Chemically Sustained Shock Waves," C.T. White, D.H. Robertson, M.L. Elert, D.W. Brenner, in Microscopic Simulations of Complex Hydrodynamic Phenomena, 111, 1992.

"Physicochemical Aspects of Aviation Fuel Thermal Stability," R.N. Hazlett, in ASTM STP 1138, Aviation Fuel Thermal Stability Requirements, P.W. Kirklin and P. David, eds., pp. 18-33, 1992.

"Processable Low Dielectric Constant Fluorinated Acrylic Resins," J.R. Griffith, H.S.-W. Hu, in ACS Symposium Series Book: Polymers for Microelectronics, 1992.

"Recent Developments in the Chemistry of Florinated Isopropoxides and Tertiary-butoxides," A. Purdy, C.F. George, in ACS Symposium Series, 1992.

"The Role of Energy in Ion-Molecule Processes," D.C. Parent, in Proceedings of the NATO ASI on Fundamentals of Gas Phase Ion Chemistry, Mont Ste Odile, Alsace, France, published in Fundamentals of Gas Phase Ion Chemistry, 1992.

"Solid Lubrication Processes," I.L. Singer, in Fundamentals of Friction, I.L. Singer and H.M. Pollock, eds., (Kluwer Academic Publishers), 1992.

"Future Issues in Friction Research: Epilogue to NATO ASI," I.L. Singer, in Fundamentals of Friction, I.L. Singer and H.M. Pollock, eds., (Kluwer Academic Publishers), 1992.

"Laser Driven Shock Instabilities in Multimaterial Layered Solid Targets," M.H. Emery, J.H. Gardner, in Shock Compression of Condensed Matter (North-Holland Press), p. 793, 1992.

"Three-Dimensional Magnetic Reconnection in A Coronal Neutral Sheet," R.B. Dahlburg, S.K. Antiochos, T.A. Zang, in G. S. Vaiana Memorial Symposium, Palermo, IT, 1992.

"Compressibility in Turbulence Generation and Mixing," J.P. Boris, in Advances in Compressible Turbulent Mixing, GPO Publication 1992-687-052/P9000, Dannevik et al., eds., (GoVol. Printing Office), pp. 137-160, 1992.

"Vortex Shedding and Merging in High-Speed Confined Shear Flows," K. Kailasanath, J.H. Gardner, E.S. Oran, J.P. Boris, in Advances in Compressible Turbulent Mixing, Dannevik et al., eds., (Lawrence Livermore National Laboratory), pp. 217-225, 1992.

"Computations of Supersonic Flows: Shear Flows, Shocks, and Detonations," E.S. Oran, J.P. Boris, K. Kailasanath in Advances in Compressible Turbulent Mixing, Dannevik et al., eds., (Lawrence Livermore National Laboratory), pp. 515-524, 1992.

"Flow Visualization as a Basic Tool to Investigate the Dynamics and Topology of Jet," F.F. Grinstein, U.R. Obeysekare, G. Patnaik, in Visualization 92, Kaufman and Nielson, eds., (IEEE Computer Society Press), pp. 164-170, 1992.

"A Uniform Algorithm for Boundary and Interior Regions," C. Li, E.S. Oran, J.P. Boris, in Parallel Computational Fluid Dynamics, Simon, ed., (MIT Press), pp. 87-96, 1992.

"Evaluation of an Incompressible Flow Solver Based on Simple Elements," R. Ramamurti, R. Lohner, in Advances in Finite Element Analysis in Fluid Dynamics-1992, Dhaubhadel et al., eds., FED-Vol. 137, (The American Society of Mechanical Engineers), pp. 33-42, 1992.

"Oblique Detonation Structures in Ram Accelerators," C. Li, K. Kailasanath, E.S. Oran, in Modern Developments of Spectroscopy, Combustion and Energy, (Pergmon Press), 1992.

"Gamma Radiation Survey of the LDEF Spacecraft. LDEF - 69 Months in Space: First LDEF Post-Retrieval Symposium," D. McMorrow, S. Kim\*, J. Melinger, W. Lotshaw, in NASA Conference Publication 3134, Part 1, 225-236, 1992.

"The High Temperature Superconductivity Space Experiment: HTSSE I - Components and HTSSE II - Subsystems and Advanced Devices," J. Melinger, S. Gandhi, A. Hariharan, W. Warren, in Proceedings of the Applied Superconductivity Conference, ASC - '92, 1992.\*

"The Physics and Applications of Modulated Intense Relativistic Electron Beams," M. Friedman, Serlin, Y.Y. Lau, J. Krall, in Research Trends in Physics: Nonlinear and Relativistic Effects in Plasmas, (American Institute of Physics), p. 234, 1992.

"Lasers, X-ray," R.C. Elton, in Encyclopedia of Physical Science and Technology, 8, p. 671, 1992.

"Laser," C.M. Tang, in Yearbook of Science & Technology, (McGraw-Hill), p. 217, 1992.

"Nonlinear Wakefields and Optical Guiding of Intense Laser Pulses in Plasmas," E. Esarey, P. Sprangle, A. Ting, in Research Trends in Physics: Coherent Radiation Generation and Particle Acceleration, (American Institute of Physics), p. 298, 1992.

"Stimulated Backscattered Harmonic Radiation Generated by Intense Laser Interactions with Beams and Plasmas," E. Esarey, P. Sprangle, in Research Trends in Physics: Coherent Radiation Generation and Particle Acceleration, (American Institute of Physics), p. 96, 1992.

"Nuclear Spin Relaxation in Fluorozirconate Glass," O. Kanert, R. Kuchler, S. Estalji, K.L. Ngai, H. Jain  
in The Physics of Non-Crystalline Solids, pp. 178-182, 1992.

"Photoluminescence Studies of Interface Roughness in GaAs/AlAs Quantum Well Structures," D. Gammon, Shanabrook, D.S. Katzer, in Semiconductor Interfaces and Microstructures, Vol. B, Chapter 6, p. 149, 1992.

"Advance Materials Processes for Bio-Probes," M.C. Peckerar, M.L. Rebbert, in Synthetic Microstructures in Biological Research, pp. 3-16, 1992.

"MIMIC Radiation Effects," W.T. Anderson, in Reliability of Gallium Arsenide MMICs, (John Wiley and Sons), pp. 435-452, 1992.

"Space Applications of Superconductivity," M. Nisenoff, in Principles & Applications of Superconducting Quantum Interference (World Scientific), Vol. 5, pp. 275-342, 1992.

"Interpretation of Dynamical Properties of Polymeric Cluster Solutions," K.L. Ngai, in NATO ASI Series: Structure and Dynamics of Strongly Interacting Colloids and Supramolecular Aggregates in Solution, Vol. 369, S.-H. Chen et al., eds. (Kluwer Academic Publishers), pp. 221-228, 1992.

"Thermal Expansion of Metal Matrix Composites," T.A. Hahn, in Metal Matrix Composites: Processing and Interfaces, Edited by R.K. Everett and R.J. Arsenault, Academic Press, pp 329-355, 1992.

"Tensile Testing of Ceramics and Ceramic Matrix Composites," D. Lewis III, in Tensile Testing, Edited by P. Han, ASM International Chapter 7, pp 147-182, 1992.

"<sup>129</sup>Xe NMR as a Probe of Polymer Blends," J.H. Walton, J.B. Miller, C.M. Roland, J. Polymer Science: Part B: Polymer Physics, 30, 527, 1992.

"20 nm Linewidth Platinum Pattern Fabrication Using Conformal Effusive-Source Molecular Precursor Deposition and Sidewall Lithography," D.S.Y. Hsu, N.H. Turner, K.W. Pierson, VOL. A. Shamamian, J. Vac. Sci. Technol., B10, 2251, 1992.

"A New Fluorinated Polyurethane: Polymerization, Characterization and Mechanical Properties," T. Ho, K.J. Wynne, Macromolecules, 25, 3521, 1992.

"A New Fluorinated Polyurethane: Polymerization, Characterization, and Mechanical Properties," T. Ho, K.J. Wynne, Macromolecules, 25, 3521, 1992.

"A Search for Subpicosecond Absorption Components in Photosystem II Reaction Centers," S.W. McCauley, A.P. Baronavski, J.K. Rice, M.L. Ghirardi, A.K. Mattoo, Chem. Phys. Lett., 198, 437, 1992.

"A Surface Acoustic Wave Sensor Array System for Trace Organic Vapor Detection Using Pattern Recognition Analysis," S.L. Rose-Pehrsson, J.W. Grate, M. Klusty, EOS/SPIE Proceedings of the International Symposium on Environmental Sensing, Berlin, Germany 1992.\*

"A Thermochemical Model for Analyzing Low Wear-Rate Materials," I.L. Singer, Surface and Coatings Technology, 49, p. 474, 1992.

"Adsorption of a Metal Deactivator Additive onto Metal Surfaces," R.E. Morris, J.A. Schreifels, PREPRINTS, Am. Chem. Soc. DiVol. Petr. Chem., 37, p. 469, 1992.

"An Improved Noncatalytic Coating for Thermocouples," K.A. Burton, H.D. Ladouceur, J.W. Fleming, Combustion Science & Technology, 81, p. 141, 1992.

"Anomalies in the Crystallization of cis-1,4-polyisoprene in Blends with Poly(vinylethylene)," I.S. Zemel, C.M. Roland, Polymer, 4, p. 3427, 1992.

"Are Endohedral Metal (IV)C<sub>28</sub> Compounds Hypervalent?," O.D. Haberlen, N. Rosch, B.I. Dunlap, Chem. Phys. Lett., 200, p. 418, 1992.

"Are Fullerene Tubules Metallic?," J.W. Mintmire, B.I. Dunlap, C.T. White, Phys. Rev. Lett., 68, p. 631, 1992.

"Asymmetric Localization of Titanium in C<sub>28</sub>," B.I. Dunlap, O.D. Haberlen, N. Rosch, J. Phys. Chem., 96, p. 9095, 1992.

"Atomistic Simulation of the Nanoindentation of Diamond and Graphite Surfaces," J.A. Harrison, R.J. Colton, C.T. White, D.W. Brenner, Materials Research Society Symposium Proceedings, 239, p. 573, 1992.\*

"Atomistic Simulations of Diamond Films," D.W. Brenner, J.A. Harrison, Ceramic Bulletin, 71, p. 1821, 1992.

"Characterization of Fullerenes by Mass Spectrometry," S.W. McElvany, M.M. Ross, J.H. Callahan, Accounts of Chemical Research, 25, p. 162, 1992.

"Chemical Precipitation and Properties of Nanocrystalline Fe-Cu Alloy and Composite Powders," G.M. Chow, T. Ambrose, J.Q. Xiao, M.E. Twigg, S. Baral, A.M. Ervin, S.B. Qadri, C.R. Feng, Nano Structured Materials, 1, p. 361, 1992.

"Chemical Vapor Deposition Diamond Nucleation Induced by sp<sup>2</sup> Carbon on Unscratched Si," P.E. Pehrsson, J. Glesener, A.A. Morrish, Thin Solid Films, 212, p. 81, 1992.

"Chemistry of Metal and Semi-Metal Cluster Ions," D.C. Parent, S.L. Anderson, Chem. Rev., 92, p. 1541, 1992.

"Comparative Cyanate and Epoxy Resin Hydrogen Bonding Studies," A.W. Snow, J.P. Armistead, Polymeric Materials Science and Engineering Preprints, 66, p. 508, 1992.

"Computer Simulation of Steel Cord Radiograph Profiles," E.C. Greenawald, C.F. Poranski, Jr., Review of Progress in Quantitative Nondestructive Evaluation, 11, p. 2299, 1992.

"Connecting Carbon Tubules," B.I. Dunlap, Phys. ReVol. B, 46, 1933, 1992.

"Deep UV Photochemistry and Patterning of Self-Assembled Monolayer Films," J.M. Calvert, J.H. Georger, Jr., M.C. Peckerar, P.E. Pehrsson, J.M. Schnur, P.E. Schoen, Thin Solid Films, 210/211, p. 359, 1992.

"Delayed Initiation in a Model Energetic Material," D.H. Robertson, D.W. Brenner, C.T. White, Proceedings of the 1992 MRS Fall Meeting, 1992.\*

"Determination of the Ground State of Manganese Phthalocyanine in an Argon Matrix Using Magnetic Circular Dichroism and Absorption Spectroscopy," B.E. Williamson, T.C. VanCott, M.E. Boyle, G.C. Misener, M.J. Stillman, P.N. Schatz, J. Am. Chem. Soc., 114, p. 2412, 1992.

"Direct Monitoring of CH<sub>3</sub> in a Filament-Assisted Diamond Chemical Vapor Deposition Reactor," F.G. Celii, J.E. Butler, J. Appl. Phys., 71, p. 2877, 1992.

"Dissociative Phase Transitions from Hypervelocity Impacts," C.T. White, D.H. Robertson, D.W. Brenner, Physica A, 188, p. 357, 1992.

"Dissociative Phase Transitions. Split Shock Waves. Rarefaction Shocks. and Detonations," C.T. White, D.H. Robertson, M.L. Elert, J.W. Mintmire, D.W. Brenner, Proceedings of the 1992 Fall Meeting of the Materials Research Society. 1992.\*

"Drugs of Abuse in Saliva: A Review," W. Schramm, R.H. Smith, P.A. Craig, D.A. Kidwell, J. Anal. Toxicology, 16, p. 1, 1992.

"Effect of a Titanium Nitride Interlayer on the Endurance and Composition of a Molybdenum Disulfide Coating Prepared by Ion-Beam-Assisted Deposition," L.E. Seitzman, I.L. Singer, R.N. Bolster, C.R. Gosset, Surface and Coatings Technology, 51, p. 232, 1992.

"Effect of Radiation in Diffusion Flame Behavior Over a Combustible Solid," J.S. Kim, S.W. Baek, C.R. Kaplan, Combustion Science Technology, 88, p. 133, 1992.

"Effect of Roughness on the Friction of Diamond on CVD Diamond Coatings," I.P. Hayward, I.L. Singer, L.E. Seitzman, Wear, 157, p. 215, 1992.

"Einstein Transition Probabilities for the  $AIH A1\Pi = X1 \Sigma +$  Transition," J.K. Rice, L.R. Pasternack, H.H. Nelson, Chem. Phys. Lett., 189, p. 43, 1992.

"Electrochemical Roughening of Au(110) Single Crystal Electrodes," K.M. Robinson, W.E. O'Grady, I.K. Robinson, Surface X-Ray and Neutron Scattering, H. Zabel and I.K. Robinson Eds. Springer Verlag, Berlin, 61, p. 175, 1992.

"Electrochemically Induced Surface Roughness on Au(100) Studied by Surface X-Ray Diffraction," K.M. Robinson, I.K. Robinson, W.E. O'Grady, Electrochimica. Acta, 37, p. 2169, 1992.

"Electrochemically Modified Surface Structure of Au(100) Single Crystals," K.M. Robinson, W.E. O'Grady, I.K. Robinson, X-ray Methods in Corrosion and Interfacial Electrochemistry, 92, p. 25, 1992.

"Electrodeposition of Refractory Carbide Coatings from Fluoride Melts," K.H. Stern, J. Appl. Electrochem., 22, p. 717, 1992.

"Electron-Beam Microprobe Analysis of the Wear Behavior of Sputter-Deposited MoS<sub>2</sub> Coatings," P.D. Ehni, I.L. Singer, Appl. Surf. Sci., 59, p. 45, 1992.

"Electronic Quenching of the B<sub>2</sub>Σ<sup>+</sup> State of AlO," M.L. Campbell, R.E. McClean, N.L. Garland, H.H. Nelson  
Chem. Phys. Lett., 194, p. 187, 1992.

"Electronic Structures of Heterocyclic Ladder Polymers: Polyphenothiazine, Polyphenoxazine, and Polyphenoquinoline," S.Y. Hong, M. Kertesz, Y.S. Lee, O.-K. Kim, Chem. Mater., 4, p. 378, 1992.

"Energetics of Nanoscale Graphitic Tubules," D.H. Robertson, D.W. Brenner, J.W. Mintmire, Phys. Rev. B, 45, p. 12592, 1992.

"Environmentally Stable Conductive Polymers from Bis(Ethynylstyryl) Benzene Monomers," T.R. Walton, R.F. Gratz, J. Appl. Polymer Science, 44, p. 387, 1992.

"EPR of a Free Radical in C<sub>60</sub>: Effect of O<sub>2</sub>," M.D. Pace, T.C. Christidis, J.J. Yin, J. Milliken, J. Phys. Chem., 96, p. 6855, 1992.

"Estimates of Peak Areas and Relative Atomic Amounts from Wide-scan XPS Spectra," N.H. Turner, Surface and Interface Analysis, 18, p. 47, 1992.

"Evaluation of Diamond Films by Nuclear Magnetic Resonance and Raman Spectroscopy," K.M. McNamara, K.K. Gleason, D.J. Vestyck, J.E. Butler, Diamond and Related Materials, 1, p. 1145, 1992.

"Evaluation of Refractivity Intercept as a Method for Determining Fuel Composition According to Hydrocarbon Type," S.G. Pande, D.R. Hardy, Fuel, 71, 1992.

"Flame Extinguishant Properties of Dry Chemicals: Extinction Weights for Small Diffusion Pan Fires and Additional Evidence for Flame Extinguishant by Thermal Mechanisms," C.T. Ewing, F.R. Faith, J.B. Romans., J.T. Hughes, H.W. Carhart, J. Fire Prot. Eng., 4, p. 35, 1992.

"Fluorescence Probe Studies of Poly(acrylic acid) Complexation & Chain Rigidity Induced by High Shear Flow. Influence of Molecular Environment," O.-K. Kim, L.-S. Choi, Proceedings of Material Research Society, 248, p. 163, 1992.\*

"Formation of Silicon Carbide Cluster Cations and their Reactions with Acetylene. Unusual Behavior of the Disilicon Carbide Ions," D.C. Parent, Int'l J. of Mass Spectrom. Ion Phys., 116, p. 257, 1992.

"Free Radical Mechanisms in High Density Nitro-Compounds: Hexanitroisowurtzitane, a New High-Energy Nitramine," M.D. Pace, Mol. Cryst. Liq. Cryst., 219, p. 139, 1992.

"Frequency-Independent and Frequency-Dependent Polymer Transitions Observed on Flexural Plate Wave Ultrasonic Sensors," J.W. Grate, S.W. Wenzel, R.M. White, Anal. Chem., 64, p. 413, 1992.

"Friction and Wear Properties of Diamonds and Diamond Coatings," I.P. Hayward, Surface and Coatings Technology, 49, p. 554, 1992.

"Fuel Instability Studies: Reaction of Polar Nitrogen Heterocycles Derived from a Stable Shale Fuel," E.J. Beal, G.W. Mushrush, D.L. Gregory, W.N. Stalick, R. Malhotra, Fuel Science and Technology International, 10, p. 199, 1992.

"Gas-Phase Modeling of Homogeneous Boron/Oxygen/Hydrogen/Carbon Combustion," L.R. Pasternack, Combustion and Flame, 90, p. 259, 1992.

"Gas-Phase Reactions of Molybdenum Oxide Ions with Small Hydrocarbons," C.J. Cassady, S.W. McElvany, Organometallics, 11, p. 2367, 1992.

"Geometrical and Electronic Structures of Benzimidazo-Benzophenanthroline-type Ladder Polymer," S.Y. Hong, M. Kertesz, Y.S. Lee, O.-K. Kim, Macromolecules, 25, p. 5424, 1992.

"High Temperature Phthalonitrile Resins for Structural Applications," T.M. Keller, NRL Review, Publication 202-4830, p. 130, 1992.

"In Situ X-ray Diffraction of Diacetylene Monolayers," K.M. Robinson, C. Hernandez, J.A. Mann, Jr., Thin Solid Films, 210/211, p. 73, 1992.

"Incorporation of C<sub>60</sub> in Langmuir-Blodgett Films," J. Milliken, D.D. Dominguez, H.H. Nelson, W.R. Barger, Chemistry of Materials, 4, p. 252, 1992.

"India as a Hot Corrosion-Resistant Stabilizer for Zirconia," R.L. Jones, D. Mess, J. Am. Ceram. Soc., 75, p. 1818, 1992.

"Influence of Water on the Reaction Between Amidoamine and Epoxy Resins," R.F. Brady, Jr., J.M. Charlesworth, Polym. Mater. Sci. Eng., 67, p. 274, 1992.

"Interactions Between C<sub>60</sub> and Endohedral Alkali Atoms," B.I. Dunlap, J.L. Ballester, P.P. Schmidt, J. Phys. Chem., 96, p. 9781, 1992.

"Ion Pickup of Large, Surface-Adsorbed Molecules: A Demonstration of the Eley-Rideal Mechanism," E.R. Williams, G.C. Jones, Jr., L. Fang, R.N. Zare, B.J. Garrison, D.W. Brenner, J. Am. Chem. Soc., 114, p. 3207, 1992.

"Kinetics of the Reaction  $V(a_4F_3/2, a_6D_3/2) + OX$  ( $X = O, N,$  and  $CO$ )," R.E. McClean, L.R. Pasternack, J. Phys. Chem., 96, p. 9828, 1992.

"Letter to the Editor of Science re: 'Women in Science,'" D.R. Rolison, J.K. Rice, W.E. O'Grady, P.A. Thiel, Science 256, p. 1614, 1992.

"Local Heteroepitaxial Diamond Growth on (100) Silicon," D.G. Jeng, H. Tuan, J.E. Butler, R.F. Salat, G.J. Fricano, Diamond and Diamond-Like Films and Coatings, p. 627, 1992.

"Magnetometer Imaging of Hazardous Waste Sites," J.R. McDonald, J. Cochran, Civil Engineering, 62, p. 15, 1992.

"Mass Spectrometry and Fullerenes," S.W. McElvany, M.M. Ross, J. Am. Soc. Mass. Spectrom., 3, p. 268, 1992.



- "Mass Spectrometry of Metallofullerenes," M.M. Ross, H.H. Nelson, J.H. Callahan, S.W. McElvany, Proceedings of the Materials Research Society Symposium 1992.\*
- "Mechanisms on the Nonlinear Optical Response in Tetrakis(cumylphenoxy)phthalocyanines," S.R. Flom, J.S., Shirk, J.R. Lindle, F.J. Bartoli, Z.H. Kafafi, R.G.S. Pong, A.W. Snow, Mat. Res. Soc. Symp. Proc., 247, p. 271, 1992.\*
- "Miscibility in Poly(vinylethylene) Isotopic Mixtures by Carbon-13 NMR," K.J. McGrath, C.M. Roland, Macromolecules, 25, p. 166, 1992.
- "Molecular Description of Chemically Sustained Shock Waves," C.T. White, D.H. Robertson, J.W. Mintmire, D.W. Brenner, M.L. Elert, Review of Defense Science and Technology, 16, p. 157, 1992.
- "Molecular Dynamics Simulations and Experimental Studies of the Formation of Endohedral Complexes of Buckminsterfullerene," R.C. Mowrey, M.M. Ross, J.H. Callahan, J. Phys. Chem., 96, p. 4755, 1992.
- "Molecular Dynamics Simulations of Dimer Opening on a Diamond {001}(2x1) Surface," B.J. Garrison, E. Dawnkaski, D. Srivastava, D.W. Brenner, Science, 255, p. 835, 1992.
- "Molecular-Dynamics Simulations of Atomic-Scale Friction of Diamond Surfaces," J.A. Harrison, C.T. White, R.J. Colton, D.W. Brenner, Phys. Rev. B, 46, p. 9700, 1992.
- "Multiple Pulse NMR Imaging of Polymers and Chemistry," J.B. Miller, D.G. Cory, L.G. Butler, A.N. Garroway, Magn. Reson. Imag., 10, p. 789, 1992.
- "Multiple-Quantum NMR Studies of Monomeric bonded Silica Phases," W. Gerasimowicz, A.N. Garroway, J.B. Miller, L.C. Sander, J. Phys. Chem., 96, p. 3658, 1992.
- "Nafion Supported Catalysts for the Electrochemical Oxidation of Methanol in Acid Media," W.E. O'Grady, A.K. Kowalak, D.R. Rolison, Electrochemical Society Meeting, Extended Abstracts 91-2, p. 43, 1992.
- "Nanoscale Investigation of Indentation, Adhesion, and Fracture of Diamond {111} Surfaces," J.A. Harrison, C.T. White, R.J. Colton, D.W. Brenner, Surface Science, 271, p. 57, 1992.
- "Negative Excess Enthalpy in a Van Der Waals Polymer Mixture," D. Tomlin, C.M. Roland, Macromolecules, 25, p. 2994, 1992.
- "NMR Imaging of Anisotropic Solid State Chemical Reactions Using Multiple-Pulse Line Narrowing Techniques and  $1H T_1$  Weighting," L.G. Butler, D.G. Cory, K.M. Dooley, J.B. Miller, A.N. Garroway, J. Am. Chem. Soc., 114, p. 125, 1992.
- "NMR Study of Chain Interactions in Freeze Dried Polystyrene Solutions," Macromolecules, 25, p. 1336, 1992.
- "Nonlinear Optical Properties of Buckminsterfullerene, C<sub>60</sub>, in the Near-Infrared," Z.H. Kafafi, J.R. Lindle, R. Pong, F.J. Bartoli, L.J. Lingg, J. Milliken, Mat. Res. Soc. Symp. Proc., 247, p. 393, 1992.\*
- "Nonlinear Optical Properties of Quantum-Confined GaAs Nanocrystals in Vycor Glass," B.L. Justus, R.J. Tonucci, A.D. Berry, Appl. Phys. Lett., 61, p. 3151, 1992.

"Normalization of the Temperature Dependence of Segmental Relaxation Times," C.M. Roland, K.L. Ngai, *Macromolecules*, 25, p. 5765, 1992.

"Nucleation Growth and Structure of Fullerene Films on Au(111)," E.I. Altman, R.J. Colton, *Surface Science*, 279, p. 49, 1992.

"Off-Resonant Nonlinear Optical Properties of C60 Studied by Degenerate Four-Wave Mixing," Z.H. Kafafi, J.R. Lindle, R.G.S. Pong, F.J. Bartoli, L.J. Lingg, J. Milliken, *Chem. Phys. Lett.*, 188, p. 492, 1992.

"On the Characterization of the Reaction of Organotin Compounds with D-Glucuronic Acid," H.E. Guard, W.M. Coleman, M.M. Ross, *Carbohydrate Research*, 235, p. 41, 1992.

"On the Way to Fullerenes: Molecular Dynamics Study of the Curling and Closure of Graphitic Ribbons," D.H. Robertson, D.W. Brenner, C.T. White, *J. Phys. Chem.*, 96, p. 6133, 1992.

"Orientational Correlations in Polyisoprene/poly(vinylethylene) Mixtures," I.S. Zemel, C.M. Roland, *Polymer*, 33, p. 4522, 1992.

"Oxygen Incorporation in Mo/Ni Multilayers," J.L. Makous, R.T. Lareau, S.M. Hues, *Thin Solid Films*, 216, p. 259, 1992.

"Photoemission of Adsorbed Xenon: A Study of Surface Defects Generated by Ion Bombardment of Ni(111)," G.P. Malafsky, S.S. Fu, D.S.Y. Hsu, *J. Vac. Sci. Technol.*, A10, p. 3492, 1992.

"Polymerization of reactive fluoroaliphatic diamines with sebacoyl chloride to give fluorinated aliphatic polyamides (Nylons)," A.E. Mera, J.R. Griffith, *J. Fluorine Chem.*, 59, p. 81, 1992.

"Possible Many-Body Effects in Scanning Tunneling Microscopy of Molecular Adsorbates," J.W. Mintmire, J.A. Harrison, R.J. Colton, C.T. White, *J. Vac. Sci. Technol. A*, 10, p. 603, 1992.

"Pressure and Temperature Dependence of the Kinetics of the Reaction Al+CO<sub>2</sub>," N.L. Garland, C.H. Douglass, H.H. Nelson, *J. Phys. Chem.*, 96, p. 8390, 1992.

"Principles and Formulations for Organic Coatings with Tailored Infrared Properties," R.F. Brady, Jr., L.VOL. Wake, *Progress in Organic Coatings*, 20, p. 1, 1992.

"Production and Characterization of Metallofullerenes," M.M. Ross, H.H. Nelson, J.H. Callahan, S.W. McElvany, *J. Phys. Chem.*, 96, p. 5231, 1992.

"Production and Fragmentation of Molybdenum Oxide Ions," C.J. Cassady, S.W. McElvany, D.A. Weil, *J. Chem. Phys.*, 96, p. 691, 1992.

"Radial Vibrations of a Sodium Ion Inside Icosahedral C60," J.L. Ballester, B.I. Dunlap, *Phys. Res.*, Vol. A, 45, p. 7985, 1992.

"Ring-Opening Polymerization of Spirobis lactones in a Solid Acrylic Matrix," R.F. Brady, Jr., A.M. Sikes, *Polymer Bulletin*, 28, p. 375, 1992.

"Second Derivatives Of the Local-Density-Functional Total Energy When the Local Potential is Fitted," B.I. Dunlap, J. Andzelm, *Phys. Res.*, Vol. A, 45, p. 81, 1992.

"Segmental Relaxation and the Correlation of Time and Temperature Dependencies in Poly(vinyl methyl ether)/Polystyrene Mixtures." C.M. Roland, K.L. Ngai, *Macromolecules*, 25, p. 363, 1992.

"Segmental Relaxation in Miscible Polymer Blends." C.M. Roland, K.L. Ngai, *J. Rheology*, 36, p. 1691, 1992.

"Selective Metallization of CVD Diamond Films." J.M. Calvert, P.E. Pehrsson, C.S. Dulcey, M.C. Peckerar, *Proceedings of Materials Research Society* 1992.\*

"Sodium Fluoride Thin Films by Chemical Vapor Deposition." L.J. Lingg, A.D. Berry, A.P. Purdy, K.J. Ewing, *Thin Solid Films*, 209, p. 9, 1992.

"Structural and Elastic Properties of Transition Metal Superlattices." R.S. Jones, J.A. Slotwinski, J.W. Mintmire, *Phys. Res. Vol. B*, 45, p. 13624, 1992.

"Structural Characterization by Low Energy Auger Electron and Photoelectron Scattering." Y.U. Idzerda, D.E. Ramaker, *Phys. Res. Vol. Lett.*, 69, p. 1943, 1992.

"Structural, Elastic and Transport Properties of Ag/Al Multilayer Thin Films Prepared by Ion-Beam Sputtering." C. Kim, S.B. Qadri, T.M. Tritt, A.C. Ehrlich, S.M. Hues, R.L. Jacobsen, S. Kumar, M. Grimsditch, *Surface and Coatings Technology*, 49, 143, 1992.

"Structure of ( $\mu$ -Oxalato)-trans-bis[N,N,N',N'-tetramethylethylenediamine-perfluoro-tert-butoxycopper(II)] Benzene Solvate." C.F. George, A.P. Purdy, *Acta Cryst.*, C48, 155, 1992.

"Structure of Au(100) and Au(111) Single Crystals Surfaces Prepared by Flame Annealing." K.M. Robinson, I.K. Robinson, W.E. O'Grady, *Surf. Sci.*, 262, 387, 1992.

"Surface Analysis: X-ray Photoelectron Spectroscopy and Auger Electron Spectroscopy." N.H. Turner, J.A. Schreifels, *Anal. Chem. Fund. Res. Vol. 64*, 302R, 1992.

"Synthesis and Characterization of Neopentyl- and [Trimethylsilyl]-methylantimony Compounds. Molecular Structures of (Me<sub>3</sub>CCH<sub>2</sub>)<sub>3</sub>Sb, (Me<sub>3</sub>CCH<sub>2</sub>)<sub>3</sub>SbI<sub>2</sub>, (Me<sub>3</sub>SiCH<sub>2</sub>)<sub>3</sub>Sb, and (Me<sub>3</sub>SiCH<sub>2</sub>)<sub>3</sub>SbI<sub>2</sub>." D.G. Hendershot, J.C. Pazik, C.F. George, A.D. Berry, *Organometallics*, 11, 2163, 1992.

"Synthesis and Characterization on an Oligomeric Mercury-Bridged Phthalocyanine." R. George, A.W. Snow, P. McMillan, *Vol. Borrows, J. Am. Chem. Soc.*, 114, 8286, 1992.

"Synthesis and Structure of Alkali-Metal Triorganozincates." A.P. Purdy, C.F. George, *Organometallics*, 11, 1955, 1992.

"Synthesis, Characterization, and Chemical Vapor Deposition Properties of Primary and Secondary Neopentylstibine. New Antimony Precursors for MOCVD." D.G. Hendershot, J.C. Pazik, A.D. Berry, *Chem. Mater.*, 4, 833, 1992.

"Temperature Dependence of Segmental Motion in Polyisobutylene and Poly(vinylethylene)." C.M. Roland, K.J. McGrath, K.L. Ngai, *Macromolecules*, 25, 4911, 1992.

"Temperature Dependence of the Kinetics of the Reaction Al + O<sub>2</sub> → AlO + O." N.L. Garland, H.H. Nelson, *Chem. Phys. Lett.*, 191, 269, 1992.

"The Development of Hot-Corrosion-Resistant Zirconia Thermal Barrier Coatings," R.L. Jones, Materials at High Temperatures, 9, 228, 1992.

"The Magnetostriction of CoFeNiMo Metallic Glasses Measured with a Tunneling Transducer," R.A. Brizzolara, R.J. Colton, J. Magnetism and Magnetic Materials, 103, 111, 1992.

"The Nature of Core Excited States in C60 as Exhibited by the Auger Line Shape," D.E. Ramaker, N.H. Turner, J. Milliken, J. Phys. Chem., 96, 7627, 1992.

"The Predominant Role of Swelling-Induced Modulus Changes of the Sorbent Phase in Determining the Responses of Polymer-Coated Surface Acoustic Wave Vapor Sensors," J.W. Grate, M. Klusty, R.A. McGill, M.H. Abraham, G. Whiting, J. Andonian-Haftvan, Anal. Chem., 64, 610, 1992.

"The Production of Endohedral Yttrium-Fullerene Cations by Direct Laser Vaporization," S.W. McElvany, J. Phys. Chem., 96, 4935, 1992.

"The Terminal and Segmental Relaxations in Epoxidized Polyisoprene," C.M. Roland, Macromolecules, 25, 7031, 1992.

"The Use of Barnacle Adhesion Measurements for the Field Evaluation of Non-Toxic Fouling Release Surfaces," G.W. Swain, J.R. Griffith, J.D. Bultman, H.L. Vincen, Biofouling, 6, 105, 1992.

"Thermogravimetric Study of the 800oC Reaction of Zirconia Stabilizing Oxides with SO<sub>3</sub>-NaVO<sub>3</sub>," R.L. Jones, J. Electrochem. Soc., 139, 2794, 1992.

"Third-Order Nonlinear Optical Properties of Metallo-Phthalocyanines," J.S. Shirk, J.R. Lindle, F.J. Bartoli, Z.H. Kafafi, A.W. Snow, M.E. Boyle, Inter. J. of Nonlinear Optical Physics, 4, 699, 1992.

"Third-Order Nonlinear Optical Properties of Phthalocyanines," J.S. Shirk, J.R. Lindle, S.R. Flom, F.J. Bartoli, A.W. Snow, Mat. Res. Soc. Symp. Proc., 247, 197, 1992.\*

"Third-Order Optical Nonlinearities of Bis(phthalocyanines)," J.S. Shirk, J.R. Lindle, F.J. Bartoli, M.E. Boyle, J. Phys. Chem, 96, 5847, 1992.

"Time Resolved X-ray Absorption Spectroscopic Techniques," W.E. O'Grady, Structural Effects in Electrocatalysis and Oxygen Electrochemistry, 92-11, 168, 1992.

"Trends in the Temperature Dependency of Segmental Relaxation in TMPC/PS Blends," K.L. Ngai, C.M. Roland, J.M. O'Reilly, J.S. Sedita, Macromolecules, 25, 3906, 1992.

"Ultrafast Studies of Solvent Effects in the Isomerization of cis-Stilbene," J.K. Rice, A.P. Baronavski, J. Phys. Chem., 96, 3359, 1992.

"Volume Change in the Polymerization of Spirocyclic Monomers: Causes, Effects, and Applications," R.F. Brady, Jr., J.M.S.-Res., Macromol. Chem. Phys., C32, 135, 1992.

"Work-Function Anisotropies as an Origin of Long-Range Surface Forces," N.A. Burnham, R.J. Colton, H.M. Pollock, Phys. Res., Lett., 69, 144, 1992.

"X-ray Diffraction of MoS<sub>2</sub> Coatings Prepared by Ion-Beam-Assisted Deposition," L.E. Seitzman, R.N. Bolster, I.L. Singer, Surface and Coatings Technology, 52, 93, 1992.

"A Circuit for Studying the Synchronization of Chaotic Systems," T.L. Carroll, L.M. Pecora, International Journal of Bifurcation and Chaos, Vol. 2, No. 3, pp 659-667, 1992.

"Abstract Zwanzig Model Reduction Theory with Application to Discretized Linear Systems," L.D. Flippin, Jr., Mathl. Comput. Modelling Vol. 16, No. 10, pp 121-134, 1992.

"An Evaluation of the Impression Test for Estimating the Tensile Properties of Metallic Materials," H.N. Jones, Journal of Testing and Evaluation, JTEVA. Vol. 20, No. 6, pp 403-407, 1992.

"Angular Dependence of Critical Currents of High Temperature Superconducting Films in High Magnetic Fields Prepared by Metalorganic Deposition," D.H. Liebenberg, P.C. McIntyre, M.J. Cima, T.L. Francavilla, Cryogenics Vol. 32, No. 11, p 1066, 1992.

"Centre of Dilatation and Thermal Stresses in an Elastic Plate," H.Y. Yu, S.C. Sanday, Proc. R. Soc. Lond. A, 438, pp 103-112, 1992.

"Chaos, Communications, and Signal Processing," L.M. Pecora, T.L. Carroll, SPIE Vol. 1771, Applications of Digital Image Processing XV, p. 389, 1992.

"Chemical Ordering in Zn<sub>1-x</sub>Fe<sub>x</sub>Se Alloys," K. Park, L. Salamanca-Riba, B.T. Jonker, Appl. Phys. Lett. 61 (19), p 2302, 1992.

"Chemical Precipitation and Properties of Nanocrystalline Fe-Cu Alloy and Composite Powders," G.M. Chow, T. Ambrose, J.Q. Xiao, M.E. Twigg, S. Baral, A.M. Ervin, S.B. Qadri, C.R. Feng, NanoStructured Materials Vol. 1, pp 361-368, 1992.

"Coherency Strain Effects in Metallic Bilayers," P.P. Delsanto, VOL. Provenzano, H. Uberall, J. Phys: Condens. Matter 4, 3915-3928, 1992.

"Connection Machine Simulation of Ultrasonic Wave Propagation in Materials. I: The One-Dimensional Case," P.P. Delsanto, T. Vol. Whitcombe, H.H. Chaskelis, R.B. Mignogna, Wave Motion 16, 65-80, 1992.

"Constitutive Modelling of Spall Fracture," J.T. Eftis, J.A. Nemes, Arch. Mech. 43, 2-3. pp 300-435, 1992.

"Correlation Between Microstructure and Properties of High Tc Films: Application to Microwave Properties," Vol. Z. Kresin, S.A. Wolf, G. Deutscher, Materials Science and Engineering, B12, 365-368, 1992.

"Correlation Between Structure and Magnetic Anisotropy in Amorphous FE-TB Alloy Films," Vol. G. Harris, K.D. Aylesworth, W.T. Elam, N.C. Koon, Journal of Alloys and Compounds, 181, pp. 431-443, 1992.

"Corrosion Fatigue Crack Growth of Steels in Aqueous Solutions I: Experimental Results and Modeling the Effects of Frequency and Temperature," J.P. Thomas, R.P. Wei, Materials Science and Engineering, A 159, pp. 205-221, 1992.

"Corrosion Fatigue Crack Growth of Steels in Aqueous Solutions II: Modeling the Effects of  $\Delta K$ ," J.P. Thomas, R.P. Wei, Materials Science and Engineering, A 159, pp. 223-229, 1992.

"Creep of Molybdenum Disilicide Composites," K. Sadananda, C.R. Feng, H.N. Jones, J. Petrovic, Materials Science and Engineering, A155, pp. 227-239, 1992.

"Determination of the Structural Anisotropy in Amorphous Tb-Fe films." Vol. G. Harris, K.D. Aylesworth, B.N. Das, W.T. Elam, N.C. Koon, IEEE Transactions on Magnetics, Vol. 28, No. 5, pp. 2958-2963, 1992.

"Dislocation Emission from Grain Boundaries During Rapid Heating or Cooling." J.C.M. Li, M.A. Imam, B.B. Rath, Journal of Materials Science Letters 11, pp. 906-908, 1992.

"DMS Based Quantum Wells with Magnetically Tuned Heavy Hole Confinement." A. Petrou, W.C. Chou, X.C. Liu, J. Warnock, B.T. Jonker, Journal of Luminescence 52, pp. 175-181, 1992.

"Early Transient Response During Crack Propagation in a Weakly-Coupled Thermoelastic Solid." L.M. Brock, P. Matic, VOL. G. DeGiorgi, Int. J. Solids Structures Vol. 29, No. 8 pp 973-989, 1992.

"Effects of Heat Treatments on Multilayer Piezoelectric Ceramic-Air Composites." M. Kahn, M. Chase, J. Am. Ceram. Soc., 75 (3) 649-56, 1992.

"Elastic Constant Softening in NonPeriodic Mo/Ni Multilayers." G.Y. Richardson, J.L. Makous, H.Y. Yu, A.S. Edelstein, Physical Review B, Vol. 45, No. 20, p 112-114, 1992.

"Elastic Inhomogeneous Inclusion and Inhomogeneity in Bimaterials." H.Y. Yu, S.C. Sanday, Proc. R. Soc. Lond. A, 439, 659-667, 1992.\*

"Electrical Conduction in Partially Carbonized PAN-Based Fibers." D.J. Gillespie, A.C. Ehrlich, Journal of Non-Crystalline Solids 144 , 231-239, 1992.

"Epitaxial bcc FexCo1-x Alloy Films on ZnSe(001)." C.J. Gutierrez, J.J. Krebs, G.A. Prinz, Appl. Phys. Lett. 61 (20), p 2476, 1992.

"Evidence for Strong Electron-Phonon Coupling in Thermal Conductivity of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-Δ</sub>." J.L. Cohn, S.A. Wolf, T.A. Vanderah, Physical Review B, Vol. 45, No. 1, p 511, 1992.

"Evidence in the Elastic Properties for a Stress-Related Phase Transition in the High-Tc Material: Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>x</sub>." T.M. Tritt, M. Marone, A.C. Ehrlich, M.J. Skove, D.J. Gillespie, R.L. Jacobsen, G.X. Tessema, J.P. Franck, J. Jung, Physical Review Letters, Vol. 68, No. 16, p 2531, 1992.

"Evolution of Structure with Fe Layer Thickness in Low Dimensional Fe/Tb Multilayered Structures." Vol. G. Harris, K.D. Aylesworth, W.T. Elam, N.C. Koon, R. Coehoorn, W. Hoving, Mat. Res. Soc. Symp. Proc. Vol. 238, Materials Research Society, p 635, 1992.\*

"Far-Infrared Photoresponse of Granular YBa<sub>2.1</sub>Cu<sub>3.4</sub>O<sub>7-x</sub>." U. Strom, J.C. Culbertson, S.A. Wolf, F. Gao, D.B. Tanner, G.L. Carr, Physical Review B, Vol. 46, No. 13, p 8472, 1992.

"Faraday Rotation from Zn<sub>1-x</sub>FexSe Epilayers." L.P. Fu, T. Schmiedel, A. Petrou, J. Warnock, B.T. Jonker, Appl. Phys. Lett. 60 (5), p 583, 1992.

"Fatigue and Fracture of a Ni<sub>2</sub>Cr Ordered Intermetallic Alloy." P.S. Pao, S.J. Gill, C.R. Feng, D.J. Michel, Materials Science and Engineering, A153, pp. 532-537, 1992.

Fundamental Law Preservation in Model Reduction

L.D. Flippen, Jr.

Mathl. Comput. Modelling Vol. 16, No. 11, pp 171-182, 1992.

"Growth of Near-Free-Standing YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>-Type Crystals Using a Self-Decanting Flux Method." T.A. Vanderah, C.K. Lowe-Ma, D.E. Bliss, M.W. Decker, M.S. Osofsky, E.F. Skelton, M.M. Miller, Journal of Crystal Growth 118, 385-395, 1992.

"High Temperature Superconductivity Space Experiment (HTSSE)." M. Nisenoff, D.U. Gubser, S.A. Wolf, J.C. Ritter, G. Price, Supercond. Sci. Technol. 4, 449-452, 1992.

"High-Temperature Epitaxy of Diamond in a Turbulent Flame." K.A. Snail, C.L. Vol. d, C.M. Marks, J.A. Freitas, Jr., Diamond and Related Materials, pp. 180-186, 1992.

"In-plane Thermal Conductivity of Nd<sub>2-x</sub>Ce<sub>x</sub>CuO<sub>4-y</sub>." J.L. Cohn, M.S. Osofsky, J.L. Peng, Z.Y. Li, R.L. Greene, Physical Review B, Vol. 46, No. 18, p 12 053, 1992.

"In-Plane Thermoelectric Power of Untwinned YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-Δ</sub>." J.L. Cohn, E.F. Skelton, S.A. Wolf, J.Z. Liu, Physical Review B, Vol. 45, No. 22, p 13 140, 1992.

"Induced Superconducting State and Two-Gap Structure: Application to Cuprate Superconductors and Conventional Multilayers." Vol. Z. Kresin, S.A. Wolf, Physical Review B, Vol. 46, No. 10, 1, p 6458, 1992.

"Induced Superconductivity and Gapless State in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub>." Vol. Z. Kresin, S.A. Wolf, Physica C 198, pp. 328-332, 1992.

"Ion-Beam Deposition of Zr-Al Multilayers and Their Structural Properties." S.B. Qadri, C. Kim, M.E. Twigg, D. Moon, Surface and Coatings Technology, 54/55, pp. 335-337, 1992.

"Laser Beam Welding of HY80 and HY100 Steels Using Hot Welding Wire Addition." R.H. Phillips, E.A. Metzbower, Welding Research, Supplement to the Welding Journal, 201-s - 208-s, 1992.

"Laser Surface Processing." K.P. Cooper, ASM Handbook, Vol. 18: Friction Lubrication and Wear Technology, S.D. Henry, Editor, ASM International,, pp 861-872, 1992.

"Lattice Thermal Conductivity of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-d</sub>." J.L. Cohn, S.A. Wolf, T.A. Vanderah, Selvamanickam, K. Salama, Physica, Vol. C 192, pp. 435-442, 1992.

"Limiting Subcritical Crack Growth in Glass-Matrix Composites." T.L. Jessen, D. Lewis III, J. Am. Ceram. Soc., 75 (8) 2219-24, 1992.

"Low-Velocity Impact Response of Foam-Core Sandwich Composites." J.A. Nemes, K.E. Simmonds, Journal of Composite Materials, Vol. 26, No. 4, pp 500-518, 1992.

"Magnetic Anisotropy in Epitaxial Metal Films." G.A. Prinz, Ultramicroscopy 47, pp. 346-354, 1992.

"Magnetic Properties and Local Ordering During Thermal Annealing of Amorphous Fe<sub>75</sub>Ni<sub>5</sub>B<sub>15</sub>Si<sub>5</sub> Films." S.A. Oliver, VOL. G. Harris, C. Vittoria, W.T. Elam, K.H. Kim, H.H. Hamdeh, M. Alhabash, J. Appl. Phys. 70 (10), p 5852, 1992.

- "Magnetic Properties of Ferrimagnetic Rare-Earth-Transition-Metal Films and Multilayers," N.C. Koon, K.D. Aylesworth, VOL. G. Harris, B.N. Das, Journal of Alloys and Compounds, 181, pp. 409-418, 1992.
- "Magnetic Properties of Permalloy-Coated Organic Tubules," J.J. Krebs, M. Rubinstein, P. Lubitz, M.Z. Harford, S. Baral, R. Shashidhar, Y.S. Ho, G.M. Chow, S.B., Qadri, J. Appl. Phys. 70 (10), p 6404, 1992.
- "Magnetic-Field Dependence of Critical Currents in Proton-Irradiated YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-Δ</sub> Films: Conventional Behavior of the Pinning-Force Density," M.E. Reeves, B.D. Weaver, D.A. Krieger, D.B. Chrisey, J.S. Horwitz, S.A. Wolf, G.P. Summers, Physical Review B, Vol. 45, No. 5, p 2585, 1992.
- "Metalorganic Chemical Vapor Deposition of Low Microwave Surface Resistance YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> on (100) LaAlO<sub>3</sub> and (100) SrTiO<sub>3</sub>," W.J. DeSisto, R.L. Henry, H.S. Newman, M.S. Osofsky, VOL. C. Cestone, Appl. Phys. Lett. 60(23), p 2926, 1992.
- "Metastability in Epitaxial Magnetic Metal Films," G.A. Prinz, Journal of Magnetism and Magnetic Materials 100, pp. 469-480, 1992.
- "Microstructural Path Concept Applied to Normal Grain Growth," R.A. Vandermeer, Acta metall. mater. Vol. 40, No. 6, pp 1159-1166, 1992.
- "Microstructures in Aluminum Ion Implanted with Boron and Heat Treated," R.G. Vardiman, Acta Metall. Mater. Vol. 40, No. 5, pp. 1029-1035, 1992.
- "Microstructures of Nb-26Ti-48Al+(Nb,Ti)B," C.R. Feng, D.J. Michel, Materials Science and Engineering, A152, pp. 202-207, 1992.
- "Modeling Microstructural Evolution During Recrystallization," R.A. Vandermeer, Scripta Metallurgica et Materialia, Vol. 27, pp 1563-1568, 1992.
- "Modification of Surface Texture by Grinding and Polishing Lead Zirconate Titanate Ceramics," S. Cheng, I.K. Lloyd, M. Kahn, J. Am. Ceram. Soc., 75 (8) 2293-96. 1992.
- "Mushy Zone Modeling with Microstructural Coarsening Kinetics," M.E. Glicksman, R.N. Smith, S.P. Marsh, R. Kuklinski, Metallurgical Transactions A, Vol. 23A, p 659, 1992.
- "Off Axis Growth of Y<sub>1</sub>Ba<sub>2</sub>Cu<sub>3</sub>O<sub>7-y</sub> on Different Substrates," P.R. Broussard, Vol C. Cestone, L.H. Allen, M.E. Reeves, Mat. Res. Soc. Symp. Proc. Vol. 275, p 507, 1992.
- "Optimization of the Mechanical Properties of Silicon Carbide-Fiber-Reinforced Zirconia Titanate Matrix Composites through Controlled Processing," B.A. Bender, T.L. Jessen, D. Lewis III, J. Am. Ceram. Soc., 75 (6) 1628-35, 1992.
- "Ordering in Zn<sub>0.5</sub>Fe<sub>0.5</sub>Se Epilayers Grown on InP Substrates by Molecular Beam Epitaxy," L. Salamanca-Riba, K. Park, B.T. Jonker, Mat. Res. Soc. Symp. Proc. Vol. 231, p 347, 1992.\*
- "Percolation Effects and Oxygen Inhomogeneities in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-Δ</sub> Crystals," M.S. Osofsky, J.L. Cohn, E.F. Skelton, M.M. Miller, R.J. Soulen, Jr., S.A. Wolf, T.A. Vanderah, Physical Review B, Vol. 45, No. 9, p 4916, 1992.
- "Phase and Group Velocity Considerations for Dynamic Modulus Measurement in Anisotropic Media," S.K. Sahay, R.A. Kline, R.B. Mignogna, Ultrasonics, Vol. 30, No. 6, p 373, 1992.



"Phase Segregation of Cerium in Nd<sub>2-x</sub>Ce<sub>x</sub>CuO<sub>4-y</sub>," A.R. Drews, M.S. Osofsky, H.A. Hoff, J.L. Peng, Z.Y. Li, R.L. Green, T.A. Vanderah, *Physica C* 200, pp. 122-128, 1992.

"Photoemission Electron Microscopy in Metallurgical Research: Applications Using the Balzers KE3 Metioscope," C. Hammond, M.A. Imam, *Ultramicroscopy*, 36, 173-185, 1992.

"Polynomial-Basis Model Reduction," L.D. Flippen, Jr., *Mathl. Comput. Modelling* Vol. 16, No. 12, pp 121-132, 1992.

"Preparation of KTaO<sub>3</sub> and KNbO<sub>3</sub> Solid-Solutions through Sol-Gel Processing," A. Nazeri, M. Kahn, *J. Am. Ceram. Soc.*, 75 (8) 2125-33, 1992.

"Pulsed Laser Deposition of Epitaxial BaFe<sub>12</sub>O<sub>19</sub> Thin Films," C.A. Carosella, D.B. Chrisey, P. Lubitz, J.S. Horwitz, P. Dorsey, R. Seed, C. Vittoria, *J. Appl. Phys.* 71 (10), p 5107. 1992.

"Rapid Solidification Processing with Specific Application to Aluminium Alloys," E.J. Lavernia, J.D. Ayers, T.S. Srivatsan, *International Materials Reviews* 12992 Vol. 37, No. 1, pp 1-44, 1992.

"Reconsideration of Fatigue Crack Closure," A.K. Vasudevan, K. Sadananda, N.P. Louat, *Scripta Metallurgica et Materialia*, Vol. 27, pp 1673-1678, 1992.

"Removal of Surface Carbides from Spark Machined Molybdenum and Tungsten," K.P. Cooper, J.D. Ayers, C.L. Vol. d, *Journal of Materials Science* 27, pp. 6417-6425, 1992.

"Soft-X-Ray Magnetic Circular Dichroism: A New Technique for Probing Magnetic Properties of Magnetic Surfaces and Ultrathin Films," L.H. Tjeng, Y.U. Idzerda, P. Rudolf, F. Sette, C.T. Chen, *Journal of Magnetism and Magnetic Materials* 109, pp. 288-292, 1992.

"Spin Dependence in He(23S) Metastable-Atom Deexcitation at Magnetized Fe(110) and O/Fe(110) Surfaces," M.S. Hammond, F.B. Dunning, G.K. Walters, G.A. Prinz, *Physical Review B* Vol. 45, No. 7, p 3674, 1992.

"Spin Superlattice Formation in ZnSe-Based Diluted Magnetic Semiconductor Heterostructures," B.T. Jonker, W.C. Chou, A. Petrou, J. Warnock, *J. Vac. Sci. Technol. A* 10 (4), p 1458, 1992.

"Spin-Relaxation Processes in ZnSe-Based Spin Superlattices: A Photoluminescence Study," W.C. Chou, A. Petrou, J. Warnock, B.T. Jonker, *Physical Review B*, Vol. 46, No. 7, p 4316, 1992.

"Spin-Valve Magnetoresistance of Uncoupled Fe-Cu-Co Sandwiches," A. Chaiken, P. Lubitz, J.J. Krebs, G.A. Prinz, M.Z. Harford, *J. Appl. Phys.* 70 (10), p 5864, 1992.

"Sputter Deposition of Nanocrystals and Nanocomposites," G.M. Chow, A.S. Edelstein, *NanoStructured Materials*, Vol. 1, pp 107-111, 1992.

"Sputtering at High Pressures to Produce Molybdenum Particles Studies of Magnetic Properties of Fine Particles and Their Relevance to Materials Science," A.S. Edelstein, F. Kaatz, G.M. Chow, J.M. Peritt, J.L. Dormann and D., Fiorani (Editors), Elsevier Science Publishers B.Vol, p 47, 1992.

"Strong Temperature Dependence of the 90° Coupling in Fe/Al/Fe(001) Magnetic Trilayers." C.J. Gutierrez, J.J. Krebs, M.E. Filipkowski, G.A. Prinz, Journal of Magnetism and Magnetic Materials 116, pp. L305-L310, 1992.

"Structural Characterization by Low Energy Auger Electron and Photoelectron Scattering." Y.U. Idzerda, D.E. Ramaker, Physical Review Letters, Vol. 69, No. 13, p 1943, 1992.

"Structural Origins of Magnetic Anisotropy in Sputtered Amorphous Tb-Fe Films," Vol. G. Harris, K.D. Aylesworth, B.N. Das, W.T. Elam, N.C. Koon, Physical Review Letters, Vol. 69, No. 13, p 1939, 1992.

"Structural Studies of (ZnSe/FeSe) Superlattices by Transmission Electron Microscopy," K. Park, L. Salamanca-Riba, B.T. Jonker, Mat. Res. Soc. Symp. Proc. Vol. 238, p. 683, 1992.\*

"Subsaturation Ferromagnetic Resonance in Yttrium Iron Garnet Spheres," P.H. Bryant, T.L. Carroll, L.M. Pecora, F.J. Rachford, Appl. Phys. Lett. 61 (7), p 864, 1992.

"Synthesis and Structural Characteristics of Ion-Beam Sputtered Multilayer Ag/Al Thin Films," C. Kim, S.B. Qadri, J. Vac. Sci. Technol. A 10 (4), p 1503, 1992.

"Synthesis of Equivalent Dynamic Laminate Behavior by Homogenization Techniques," P.W. Randles, Wave Motion 16, pp. 229-247, 1992.

"Techniques of Optical Caustics Photography," D.A. Meyn, Engineering Fracture Mechanics Vol. 43, No. 2, pp. 185-194, 1992.

"The Analytical Modeling of Normal Grain Growth," C.S. Pande, S.P. Marsh, Journal of Metals (JOM), Vol. 44, No. 9, pp. 25-29, 1992.

"The Dislocation Core in Crystalline Materials," M.S. Duesbery, G.Y. Richardson, Solid State and Materials Sciences, 17(1):1-46, 1992.

"The Effect of Phonon-Mediated Charge Transfer and Internal Proximity Effect on the Properties of Multigap Cuprate Superconductors," Vol. Z. Kresin, S.A. Wolf, G. Deutscher, Physica C 191, pp. 9-14, 1992.

"The Formation and Annealing of Dislocation Damage From High-Dose Self-Ion Implantation of Aluminum," R.G. Vardiman, J. Appl. Phys. 71 (11), p 5386, 1992.

"The Growth Kinetics and Shape Evolution of Precipitates Growing by the Ledge Mechanism," M. Enomoto, G. Spanos, R.A. Masumura, Mat. Res. Soc. Symp. Proc. Vol. 237, Interface Dynamics and Growth, pp. 119-13, 1992.\*

"The Mechanics and Energetics of Cross-Slip," M.S. Duesbery, N.P. Louat, K. Sadananda, Acta Metall. Mater. Vol. 40, No. 1, pp 149-158, 1992.

"The Microstructural Path of Grain-Boundary-Nucleated Phase Transformations," R.A. Vandermeer, R.A. Masumura, Acta metall. mater. Vol. 40, No. 4, pp 877-886, 1992.

"The Morphology, Crystallography, and Mechanism of Carbide Precipitation in an Fe-0.12 Pct C-3.28 Pct Ni Alloy," G. Spanos, Metallurgical Transactions A, Vol. 23A, 171-181, 1992.

"The Numerical Simulation of Continuum Dislocations," M.S. Duesbery, N.P. Louat, K. Sadananda, Philosophical Magazine A, Vol. 65, No. 2, 311-325, 1992.

"The Pitting Behavior of Silicon Nitride Ion Beam Assisted Deposited Coatings on Aluminum." P.M. Natishan, E. McCafferty, E.P. Donovan, D.W. Brown, G.K. Hubler, Surface & Coatings Technology, 51, pp. 30-34, 1992.

"Thermal Conductivity in the ab-Plane of Untwinned YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub> ." J.L. Cohn, E.F. Skelton, S.A. Wolf, J.Z. Liu, R.N. Shelton, Physical Review B, Vol. 45, No. 22, p 13 144, 1992.

"Thermoelastic Stresses in Bimaterials." H.Y. Yu, S.C. Sanday, B.B. Rath, Philosophical Magazine A, Vol. 65, No. 5, 1049-1064, 1992.

"Torque Measurements of the Magnetic Anisotropy Energy of Antiferromagnetic Coupled Fe/Cr/Fe Layers." C.M. Williams, J.J. Krebs, F.J. Rachford, G.A. Prinz, A. Chaiken, Journal of Magnetism and Magnetic Materials 110, pp. 61-64, 1992.

"Tracking Unstable Orbits in an Experiment." T.L. Carroll, I. Triandaf, I. Schwartz, L.M. Pecora, Physical Review A, Vol. 46, No. 10, p 6189, 1992.

"Twins and Lamellar Structures in Ti-Al System with Manganese Addition." A. Imam, C.R. Feng, K. Sadananda, Journal of Materials Science Letters 11, pp. 1636-1638, 1992.

"Two-Gap Superconductivity and Microwave Properties of YBCO." A. Andreone, VOL. Z. Kresin, S.A. Wolf, Journal of Superconductivity, Vol. 5, No. 4, p 339, 1992.

"Ultrafine Superstrength Materials." VOL. Provenzano, N.P. Louat, M.A. Imam, K. Sadananda, NanoStructured Materials Vol. 1, pp 89-94, 1992.

"Vibrational Modes in Zn<sub>1-x</sub>Fe<sub>x</sub>Se and Zn<sub>1-x</sub>CoxSe." C.L. Mak, R. Sooryakumar, B.T. Jonker, G.A. Prinz, Physical Review B, Vol. 45, No. 7, p 3344, 1992.

"Vortex Lattice Melting in Untwinned and Twinned Single Crystals of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub> ." W.K. Kwok, S. Fleshler, U. Welp, VOL. M. Vinokur, J. Downey, G.W. Crabtree, M.M. Miller, Physical Review Letters, Vol. 69, No. 23, p 3370, 1992.

"X Peak Measurements in HTSC Single Crystals." R.B. Flippen, T.R. Askew, M.S. Osofsky, Physica C 201, pp. 391-396, 1992.

"Ab Initio Variational State Theory Reaction Rate Calculations for the Gas-Phase Reaction H + HNO  $\rightarrow$  H<sub>2</sub> + NO." M.R. Soto, M. Page, Journal of Chemical Physics, 97, 10, 1992.

"Chemical Energy Release and Dynamics of Transitional Reactive. Free Shear Flows." F.F. Grinstein, K. Kailasanath, Physics of Fluids, A4, 2207, 1992.

"Effective Viscosity in the Simulation of Spatially Evolving Shear Flows with Monotonic FCT Models." F.F. Grinstein, R.H. Guirguis, Journal of Computational Physics, 101, 165-175, 1992.

"New Insights into Large Eddy Simulation." J.P. Boris, F.F. Grinstein, E.S. Oran, R.L. Kolbe, Journal of Fluid Dynamics Research, 1992.

"Secondary Instability in 3D Magnetic Reconnection." R.B. Dahlburg, S.K. Antiochos, T.A. Zang, EOS, Trans. AGU, 73, 234, 1992.

"Secondary Instability in Three-Dimensional Magnetic Reconnection." R.B. Dahlburg, S.K. Antiochos, T.A. Zang, Phys. Fluids B, 4, 3902, 1992.

"Structure of the Transition State for Hydrogen Molecule Elimination from 1,4- Cyclohexadiene," R.J. Rico, M. Page, C. Doubleday, Jr., Journal of the American Chemical Society, 114, 1131, 1992.

"Supersonic Flow Over an Axisymmetric Backward-Facing Step," E. Loth, K. Kailasanath, R. Lohner, Journal of Spacecraft and Rockets, Vol. 29, No. 3, 1992.

"The Stability of Imploding Detonations in the Geometrical Shock Dynamics. CCW Model," C.R. DeVore, E.S. Oran, Phys. Fluids A, 4, 835, 1992.

"A Spatially Restricted Linear Transfer Equation," G. Summers, P. Bandyopadhyay, Radiation Research, 132, 282, 1992.

"Applicability of LET to Single Events in Microelectronic Structures," M. Xapsos, IEEE Trans. Nuc. Sci., NS-39, 1613-1621, 1992.

"Atomic Disorder and the Transition Temperature of Cuprate Superconductors," B. Weaver, E. Jackson\*, G. Summers, E. Burke, Phys. ReVol. , B46, 1134, 1992.

"Comparison of SEU Rate Prediction Techniques," A. Campbell, K. Ray\*, P. McDonald, IEEE Trans. Nuc. Sci. NS-39, 1836-1839, 1992.

"CRRES Dosimetry Results and Comparisons Using the Space Radiation Dosimeter and P-channel MOS Dosimeters," E. Petersen, J. Adams, Jr., IEEE Trans. Nuc. Sci., NS-39, 1846-1850, 1992.

"Effect of Carrier Concentration on the Properties of Irradiation-induced Defects in P-type Indium Phosphide Grown by Metalorganic Chemical Vapor Deposition," S. Messenger, R. Walters, G. Summers, Journal of Appl. Phys., 71, 4201- 4207, 1992.

"Enhancement of Pinning Energy and Critical Current Density in  $Tl_2Ba_2CaCu_2O_8$  Films by Proton Irradiation," A. Campbell, Proceedings of MRS Symposium, Vol. 271 (MRS Press) 1992.\*

"Fourth International Workshop on Low Temperature Detectors," S. King, D. VanVechten, Journal of Cryogenics, 32, 685, 1992.

"Generation of Broadband Inversion with Narrowband Laser Pulses," M. Xapsos, Energy, Physical Review Letters 1992.

"Intermolecular Dynamics in Acetonitrile Probed with Femtosecond Fourier-Transform Raman Spectroscopy," D. McMorrow, W. Lotshaw, Journal of Phys. Chem., 95, 10395, 1992.

"Investigation of the Oxygen Vacancy (A-center) Defect Complex Profile in Neutron Irradiated High Resistivity Silicon Junction Particle Detectors," Z. Li, H. Kraner, E. Verbitskaya, VOL. Eremin, IEEE Trans. Nuc. Sci., NS-39, 1730- 1738, 1992.

"Laser Confirmation of SEU Experiments in GaAs MESFET Combinational Logic," R. Scheiderwind, D. Krening, S. Buchner, K. Kang, T. Weatherford, IEEE Trans. Nuc. Sci., NS-39, 1665-1670, 1992.

"Magnetic-field Dependence of Critical Currents in Proton- irradiated  $YBa_2Cu_3O_{7-8}$  films: Conventional Behavior of the Pinning Force Density," M. Reeves, B. Weaver, D. Krieger, B. Chrisey, J. Horwitz, S. Wolf, G. Summers, Phys. ReVol. , B45, 2585, 1992.

"Monohydrate Catalysis of Excited- State Double Proton Transfer in 7-Azaindole." P. Chou, M. Martinez, W. Cooper, D. McMorro, Journal of Phys. Chem., 96, 5203, 1992.

"Nuclear Spectroscopy Using in Cerussite Scintillators." P. Harihar, Risetimes W. Stapor, A. Campbell, A. Knudson, J. Cutchin, C. Blatchley, Nuclear Instruments and Methods in Physics Research, A322, 40-42, 1992.

"Order-of-magnitude Method for Estimating the Fluence that Optimizes the Critical Current in Particle Irradiated Cuprate Superconductors." B. Weaver, G. Summers, Appl. Phys. Lett., 61, 1237, 1992.

"Picosecond Charge-Collection Dynamics in GaAs MESFETs." D. McMorro, J. Melinger, A. Knudson, A. Campbell, T. Weatherford\*, L. Tran, W. Curtice, IEEE Trans., Nuc. Sci., NS-39, 1657-1664, 1992.

"Radiation Damage Assessment of Nb Tunnel Junction Devices." S. King, R. Magno, W. Maisch, IEEE Trans. Nuc. Sci., 38, 1359, 1992.

"Radiation Effects in GaIn<sub>1-y</sub>As Devices." R. Walters, G. Shaw, G. Summers, E. Burke, S. Messenger, IEEE Trans. Nuc. Sci. 1992.

"Rate Prediction for Single Event Effects - A Critique." E. Petersen, J. Pickel, J. Adams, E. Smith, IEEE Trans. Nuc. Sci., NS-39, 1577-1599, 1992.

"Single Event Phenomena Specifications for Post-NATO IV SATCOM Systems." E. Petersen, Symposium Proceedings 9, Vol. 1, STC Registry #54038, NATO SHAPE Technical Centre, Netherlands, Session III.5, 1992.\*

"Single Event Upset Concerns in GaAs Digital Circuits." M. Reeves, B. Weaver, G. Summers, R. Soulen, Jr., W. Olson, M. Eddy, T. James, E. Smith, GaAs Reliability Workshop Proceedings 1992.\*

"Single Event Upset Rates in Space." A. Campbell, P. McDonald, K. Ray, IEEE Trans. Nuc. Sci., NS-39, 1828- 1835, 1992.

"Single Event Upset Rates in Space." A. Ivanov, M. Rattaggi, P. Rancoita, F. Rubinelli, S. Fonash, C. Dale, P. Marshall, IEEE Trans. Nuc. Sci., NS-39, 1829- 1835, 1992.

"Space Radiation Effects on Optoelectronic Materials and Components for a 1300 nm Fiber Optic Data Bus." K. Ray, E. Mullen, W. Stapor, R. Circle, P. McDonald, IEEE Trans. Nuc. Sci., NS-39, 1982-1989, 1992.

"Spatial and Temporal Dependence SEU in a 64K SRAM." S. Buchner, K. Kang, W. Stapor, S. Rivet, IEEE Trans. Nuc. Sci., NS-39, 1630-1635, 1992.

"Survivability of High-Tc Microwave Devices in Space Environments." E. Jackson, B. Weaver, W. Maisch, G. Summers, IEEE Trans. Nuc. Sci., 39, 1865, 1992.

"The Relationship of Proton and Heavy Ion Upset Thresholds." J. Melinger, S. Gandhi, A. Hariharan, J. Tull, W. Warren, IEEE Nuc. Trans. Sci., NS-39, 1600, 1992.

"Thermal Annealing of Cu- ions in - Irradiated NaCl:Cu Near 415K." P. Marshall C. Dale, E. Burke, Solid State Communications, 83, 277-230, 1992.

"Transient Charge Collection From Ion Tracks in Semiconductors," D. McMorrow, A. Campbell, A. Knudson, S. Buchner, T. Weatherford, Nuclear Instruments and Methods in Physics Research, B67, 384-389, 1992.

"'Skidding' of the CRRES G-9 Barium Release," J.D. Huba, H.G. Mitchell, J.A. Fedder, P.A. Bernhardt, Geophysical Research Letters, 19, 1085, 1992.

"3D Particle Simulation of Beams Using the WARP Code: Transport Around Bends," D.P. Grote, A. Friedman, I. Haber, Particle Accelerators, 37-38, 131, 1992.

"3D Simulation of High Gain FELs in an Optical Klystron Configuration," C.M. Tang, W.P. Marable, Nuclear Instruments and Methods A, 318, 675, 1992.

"3D Simulations of Axially Confined Heavy Ion Beams in Round and Square Pipes," D.P. Grote, A. Friedman, I. Haber, Particle Accelerators, 37, 141, 1992.

"A Low-Altitude Mechanism for Mesoscale Dynamics. Structure. Current Filamentation in the Discrete Aurora," M.J. Keskinen, P.K. Chaturvedi, S.L. Ossakow, Geophysical Research Letters, 19, 2199, 1992.

"A New Theory of the Plasma Filled Diode," R.J. Kares, J.L. Geary, J.M. Grossmann, Journal of Applied Physics, 71, 2168, 1992.

"A Phase-Plate Mode Transducer for TE<sub>1n</sub> Gyrotron Modes," W.M. Black, S.H. Gold, International Journal of Electronics, 72, 1119, 1992.

"Achromatism in Final Focusing Systems for High-Current Heavy-Ion Beams," D.D.-M. Ho, K.R. Crandall, I. Haber, Particle Accelerators, 37, 155, 1992.

"Analysis of Pumping Mechanisms Affecting the Gain of the J=0-1 and J=2-1 Lines in Neonlike Selenium," A. Dasgupta, K.G. Whitney, M. Blaha, M. Buie, Physical Review A, 46, 5973, 1992.

"Analysis of the Deflection System for a Magnetic-Field-Immersed Magnicon Amplifier," B. Hafizi, Y. Seo, S.H. Gold, W.M. Manheimer, P. Sprangle, IEEE Transactions on Plasma Science, 20, 232, 1992.

"Anomalous Absorption of Electromagnetic Radiation," H.L. Rowland, Physics of Fluids B, 4, 3883, 1992.

"Application of Gyrotrons to High Power Millimeter Wave Doppler Radars," W.M. Manheimer, International Journal of Infrared and Millimeter Waves, 13, 1449, 1992.

"Ballistic Transport and Solenoidal Focusing of Intense Ion Beams for Inertial Confinement Fusion," P.F. Ottinger, D. Vol. Rose, J.M. Neri, C.L. Olson, Journal of Applied Physics, 72, 395, 1992.

"Beam Conditioning and Propagation Experiments on SuperIBEX," R.F. Hubbard, J.A. Antoniadis, R.F. Fernsler, M. Lampe, R.A. Meger, D.P. Murphy, M. Myers, R. Pechacek, T.A. Peyser, S.P. Slinker, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, 392, 1992.\*

"Beam Dynamics in the Spiral Line Induction Accelerator," S. Slinker, J. Krall, M. Lampe, G. Joyce, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 242, 1992.\*

"Channel Tracking Experiments," R.A. Meger, F.M. Bieniosek, Journal of Defense Research, 21, 417, 1992.

"Chaotic Scattering of Pitch Angles in the Current Sheet of the Magnetotail," G.R. Burkhart, J. Chen, Journal of Geophysical Research, 97, 6479, 1992.

"Characterization of a Microsecond-Conduction-Time Plasma Opening Switch," R.J. Comisso, P.J. Goodrich, J.M. Grossmann, D.D. Hinshelwood, P.F. Ottinger, B.Vol. Weber, Physics of Fluids B, 4, 2368, 1992.

"Conditioning Electron Beam in the Ion-Focused Regime," R.F. Fernsler, R.F. Hubbard, S.P. Slinker, Physics of Fluids B, 4, 4153, 1992.

"Coupling of the Relaxation and Resonant Elements in the Autonomous Chaotic Relaxation Oscillator (ACRO)," P.A. Bernhardt, Chaos, 2, 183, 1992.

"CPB Fire Control for Fleet Defense," E.E. Nolting, C.R. Fisher, A. Lee, M. Lampe, Journal of Defense Research, 21, 591, 1992.

"Demonstration of a Plasma Mirror for Microwaves," A.E. Robson, R.L. Morgan, R.A. Meger, IEEE Transactions on Plasma Science, 20, 1036, 1992.

"Demonstration of Population Inversion by Resonant Photopumping in a Neon Gas Cell Irradiated by a Sodium Z Pinch," J.L. Porter, R.B. Spielman, M.K. Matzen, E.J. McGuire, L.E. Ruggles, M.F. Vargas, J.P. Apruzese, R.W. Clark, J. Davis, Physical Review Letters, 68, 796, 1992.

"Demonstration of Vacuum Field Emission from a Self-Assembling Biomolecular Microstructure Composite," D.A. Kirkpatrick, G.L. Bergeron, M.A. Czarnaski, J.J. Hickman, G.M. Chow, R. Price, B.L. Ratna, P.E. Schoen, W.B. Stockton, S. Baral, A.C. Ting, J.M. Schnur, Applied Physics Letters, 60, 1556, 1992.

"Density Redistribution in a Microsecond-Conduction-Time Plasma Opening Switch," D.D. Hinshelwood, B.Vol. Weber, J.M. Grossmann, R.J. Comisso, Physical Review Letters, 68, 3567, 1992.

"Design Considerations for Z-pinch Driven Photoresonant X-ray Lasing in Neonlike Krypton," J.W. Thornhill, J.P. Apruzese, J. Davis, R.W. Clark, Journal of Applied Physics, 71, 4671, 1992.

"Design Considerations for Z-pinch Driven Photoresonant X-ray Lasing in Neonlike Krypton," J.W. Thornhill, J.P. Apruzese, J. Davis, R.W. Clark, Journal of Applied Physics, 71, 4671, 1992.

"Design of a Quasioptical Gyrotron Pumped IR Free-Electron Laser," A.W. Fliflet, W.M. Manheimer, Proceedings of the 17th International Conference on Infrared and Millimeter Waves, SPIE, p. 132, 1992.\*

"Design of an Electron Gun for a 280-GHz Inducted-Resonance-Electron-Cyclotron (IREC) Maser Experiment," R.B. McCowan, R.A. Pendleton, A.W. Fliflet, IEEE Transactions on Electron Devices, 39, 1763, 1992.

"Development of Wall-Stabilized Z-Discharges for Intense Ion Beam Transport in Inertial Confinement Fusion Facilities," D.D. Hinshelwood, Journal of Applied Physics, 72, 4581, 1992.

"Diodelike Response of High-Latitude Plasma in Magnetosphere Ionosphere Coupling in the Presence of Field Aligned Currents," H.G. Mitchell Jr., S.B. Ganguli., P.J. Palmadesso, Journal of Geophysical Research, 97, 12045, 1992.

"Dissipative Beam Trapping in a Modified Betatron with Strong Focusing," Y. Seo, P. Sprangle, Particle Accelerators, 39, 15, 1992.

"Effect of Energy Spread and Gyromotion on Efficiency of a Smith-Purcell FEL," B. Hafizi, P. Sprangle, P. Serafim, Nuclear Instruments and Methods A, 318, 560, 1992.

"Effects of Plasma Turbulence on Electron Collection by a High-Voltage Spherical Probe in a Magnetized Plasma," P.J. Palmadesso, G. Ganguli, Journal of Geophysical Research, 97, 6493, 1992.

"Efficiency and Frequency Stability in a High Power Microwave Gap," Y.Y. Lau, D.G. Colombant, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 637, 1992.\*

"Eigenmode Analysis of Coupled Magnetohydrodynamic Oscillations in the Magnetosphere," S. Fujita, VOL. L. Patel, Journal of Geophysical Research, 97, 13777, 1992.

"Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System," C.M. Tang, J. Krall, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 1788, 1992.\*

"Electron Beam Tracking in a Preformed Density Channel," D.P. Murphy, R.E. Pechacek, D.P. Taggart, R.F. Fernsler, R.F. Hubbard, S.P. Slinker, R.A. Meger, Physics of Fluids B, 4, 3407, 1992.

"Electron Trapping and Acceleration in a Modified Elongated Betatron," Y. Song, A. Fisher, R. Prohaska, N. Rostoker, Physics of Fluids B, 4, 3771, 1992.

"Electron-Ion Hybrid Instabilities Driven by Velocity Shear in a Magnetized Plasma," H. Romero, G. Ganguli, Physics of Fluids B, 4, 1708, 1992.

"Electron-Ion Hybrid Instability in Laser-Produced Plasma Expansions Across Magnetic Fields," T.A. Peyser, C.K. Manka, B.H. Ripin, G. Ganguli, Physics of Fluids B, 4, 2248, 1992.

"Electron-Ion Hybrid Instability in Laser-Produced Plasma Expansions Across Magnetic Fields," T.A. Peyser, C.K. Manka, B.H. Ripin, G. Ganguli, Physics of Fluids B, 4, 2448, 1992.

"Electrostatic Turbulence in the Earth's Central Plasma Sheet Produced by Multiple-Ring Ion Distributions," J.D. Huba, J. Chen, R.R. Anderson, Journal of Geophysical Research, 97, 1533, 1992.

"Fabrication of Biologically Based Microstructure Composites for Vacuum Field Emission," G.M. Chow, W.B. Stockton, R. Price, S. Baral, A.C. Ting, B.R. Ratna, P.E. Shoen, J.M. Schnur, G.L., Bergeron, M.A. Czarnaski, J.J. Hickman, D.A. Kirkpatrick, Materials Science and Engineering A, 158, 1, 1992.

"Fast Plasmoid Formation in Double Arcades," J.M. Finn, P.N. Guzdar, J. Chen, The Astrophysical Journal, 393, 800, 1992.



"Field-Emission Arrays - A Potentially Bright Source," C.M. Tang, A.C. Ting, T. Swyden, Nuclear Instruments and Methods A, 318, 353, 1992.

"Flute Instability of an Ion-Focused Slab Electron Beam in a Broad Plasma," D.H. Whittum, M. Lampe, G. Joyce, S.P. Slinker, S.S. Yu, W.M. Sharp, Physical Review A, 46, 6684, 1992.

"Generation of Stimulated Backscattered Harmonic Radiation from Intense-Laser Interactions with Beams and Plasmas," E. Esarey, P. Sprangle, Physical Review A, 45, 587, 1992.

"Harmonic Generation in Laser-Pumped FELs and Stimulated Backscattering from Plasmas," E. Esarey, P. Sprangle, Nuclear Instruments and Methods A, 318, 533, 1992.

"HeNe Interferometer for Density Measurements in Plasma Opening Switch Experiments," B. Vol. Weber, D.D. Hinshelwood, Review of Scientific Instruments, 63, 5199, 1992.

"High Current WIPS Propagation," R.L. Feinstein, R.F. Hubbard, Journal of Defense Research, 21, 369, 1992.

"High Frequency Operation of the Relativistic Klystron Amplifier," Vol. Serlin, M. Friedman, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, p. 8, 1992.\*

"High-Latitude F Region Ionospheric Interchange Modes in the Presence of Powerful Radio Waves," P.K. Chaturvedi, M.J. Keskinen, S.L. Ossakow, Journal of Geophysical Research, 97, 8559, 1992.

"Improving Plasma Uniformity in Z-pinch-driven Neonlike Krypton X-ray Lasers," J.W. Thornhill, J. Davis, J.P. Apruzese, R.W. Clark, Applied Optics, 31, 4940, 1992.

"Intense Laser Pulse Propagation, Optical Guiding and Wakefield Generation in Plasma," E. Esarey, P. Sprangle, J. Krall, G. Joyce, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, 546, 1992.\*

"Interaction of Ultrahigh Laser Fields with Beams and Plasmas," P. Sprangle, E. Esarey, Physics of Fluids B, 4, 2241, 1992.

"Interhyperhedral Diffusion in Josephson-Junction Arrays," K.Y. Tsang, I.B. Schwartz, Physical Review Letters, 68, 2265, 1992.

"Introduction to the Propagation of Intense Electron Beams," M. Lampe, Journal of Defense Research, 21, 279, 1992.

"Ion Acceleration and Coherent Structures Generated by Lower Hybrid Shear-Driven Instabilities," H. Romero, G. Ganguli, Y.C. Lee, Physical Review Letters, 69, 3503, 1992.

"LASSII Pulsed Plasma Probe on CRRES," M.M. Baumback, P. Rodriguez, D.N. Walker, C.L. Siefring, Journal of Spacecraft and Rockets, 29, 607, 1992.

"Lead Pulse Stability Issues," R.F. Hubbard, W. William, M. Fawley, Journal of Defense Research, 21, 279, 1992.

"Maximum Microwave Conversion Efficiency From a Modulated Intense Relativistic Electron Beam," D.G. Colombant, Y.Y. Lau, Physical Review A, 45, 2179, 1992.

- "Measurements on Collisional Excited Soft X-ray Lasers," E.A. McLean, T.N. Lee, J.A. Stamper, C.K. Manka, H.R. Griem, Journal of the Optical Society of America B, 9, 350, 1992.
- "Model of Cavity Coupling for Beam Breakup Control," D.G. Colombant, Y.Y. Lau, Journal of Applied Physics, 72, 3874, 1992.
- "Modeling of Dynamic Bipolar Plasma Sheaths," J.M. Grossmann, S.B. Swanekamp, P.F. Ottinger, Physics of Fluids B, 4, 44, 1992.
- "Modeling the Longitudinal Wall Impedance Instability in Heavy Ion Beams Using an R-Z PIC Code," D.A. Callahan, A.B. Langdon, A. Friedman, D.P. Grote, I. Haber, Particle Accelerators, 37-38, 97, 1992.
- "Modified Elongated Betatron Accelerator," N. Rostoker, S. Eckhouse, A. Fisher, M. Cavenago, Journal of Defense Research, 21, 557, 1992.
- "Multimode Simulation of High Frequency Gyrotrons," S.H. Gold, A.W. Fliflet, International Journal of Electronics, 72, 779, 1992.
- "Neon Gas Puff Implosions on a High-current Microsecond Generator With and Without a Plasma Opening Switch," C. Deeney, P.D. LePell, I. Roth, T. Nash, L. Warren, R.R. Prasad, C. McDonald, F.K. Childers, P. Sincerny, M.C. Coulter, K.G. Whitney, Journal of Applied Physics, 72, 1297, 1992.
- "Nonlinear Analysis of a Grating Free-Electron Laser," B. Hafizi, P. Sprangle, P. Serafim, Physical Review A, 45, 8846, 1992.
- "Nonlinear Analysis of a Magnicon Output Cavity," B. Hafizi, S.H. Gold, W.M. Manheimer, P. Sprangle, Proceedings of the 17th International Conference on Infrared and Millimeter Waves, SPIE, 1929, p. 62, 1992.\*
- "Nonlinear Dynamics of Charged Particles in the Magnetotail," J. Chen, Journal of Geophysical Research, 97, 15011, 1992.
- "Numerical Simulation of the Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System," J. Krall, C.M. Tang, T. Swyden, Physical Review A, 46, 6750, 1992.
- "Observation of Harmonic Gyro-Backward-Wave Oscillation in a 100 GHz CARM Oscillator Experiment," R.B. McCowan, C.A. Sullivan, S.H. Gold, A.W. Fliflet, International Journal of Electronics, 72, 1033, 1992.
- "Observation of Plasma Wakefield Effects During High-Current Relativistic Electron Beam Transport," J.D. Miller, R.F. Schneider, K.T. Nguyen, G. Joyce, D.J. Weidman, J. Goldhar, H.S. Uhm, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 239, 1992.\*
- "On Chaotic Conductivity in the Magnetotail," D.L. Holland, J. Chen, Geophysical Research Letters, 19, 1231, 1992.
- "On the Possibility of High Power Gyrotrons for Super Range Resolution Radar and Atmospheric Sensing," W.M. Manheimer, International Journal of Electronics, 72, 1165, 1992.
- "One-Dimensional Simulations of Current-Driven Plasma Sheaths," S.B. Swanekamp, J.M. Grossmann, P.F. Ottinger, Physics of Fluids B, 4, 3608, 1992.

"Overview of the LASSII Experiment on the Combined Release and Radiation Effects Satellite." P. Rodriguez, Journal of Spacecraft and Rockets, 29, 564, 1992.

"Pair Creation Collective Modes in an Electron Gas." P. Pulsifer, G. Kalman, Physical Review A, 45, 5820, 1992.

"Pinch Spot Formation in High Atomic Number Z-Discharges." D. Mosher, D. Colombant, Physical Review Letters, 68, 2600, 1992.

"Predicting Attracting Out-of-Phase States in Coupled Josephson Junctions." I.B. Schwartz, K.Y. Tsang, International Journal of Bifurcation and Chaos, 2, 177, 1992.

"Preliminary Study of the CRRES Magnetospheric Barium Releases." J.D. Huba, P.A. Bernhardt, J.G. Lyon, Journal of Geophysical Research, 97, 11, 1992.

"Present and Future Developments of High Power Relativistic Klystron Amplifiers." M. Friedman, Vol. Serlin, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, p. 2, 1992.\*

"Probing the Magnetosphere Using Chemical Releases from the Combined Release and Radiation Effects Satellite." P.A. Bernhardt, Physics of Fluids B, 4, 2249, 1992.

"Propagation and Guiding of Intense Laser Pulses in Plasmas." P. Sprangle, E. Esarey, J. Krall, G. Joyce, Physical Review Letters, 69, 2200, 1992.

"Railgun Recoil, Ampere Tension, and the Laws of Electrodynamics." A.E. Robson, J.D. Sethian, American Journal of Physics, 60, 1111, 1992.

"Reduction of Beam Breakup Growth by Bleeding Cavities in Linear Accelerators." D.G. Colombant, Y.Y. Lau, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 1609, 1992.\*

"Reply to the Comments of Verheest." B.K. Som, B. Dasgupta, VOL. L. Patel, M.R. Gupta, Physics of Fluids B, 4, 1372, 1992.

"RF Converter Simulation - Imposition of the Radiation Condition." D.G. Colombant, Y.Y. Lau, M. Friedman, J. Krall, Vol. Serlin, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, 15, 1992.\*

"Second Harmonic Magnicon Amplifier Experiment." S.H. Gold, C.A. Sullivan, W.M. Manheimer, Proceedings of the 17th International Conference on Infrared and Millimeter Waves, SPIE, 1929, p. 60, 1992.\*

"Simulation Studies of a Klystronlike Amplifier Operating in the 10-100 GW Regime." J. Krall, M. Friedman, Y.Y. Lau, Vol. Serlin, IEEE Transactions on Electromagnetic Compatibility, 34, 222, 1992.

"Small Amplitude, Long Period Outbreaks in Seasonally Driven Epidemics." I.B. Schwartz, Journal of Mathematical Biology, 30, 473, 1992.

"Spectroscopic Study of Neon Transport of Intense Light Ion Beams." P.F. Ottinger, P.J. Goodrich, D.D. Hinshelwood, D. Mosher, J.M. Neri, D.VOL. Rose, S.J. Stephanakis, F.C. Young, Proceedings of the IEEE, 80, 1010, 1992.

"Target Chamber Propagation of Heavy Ion Beams in the Pressure Regime Above 10<sup>-3</sup> Torr." R.F. Hubbard, M. Lampe, G. Joyce, S.P. Slinker, I. Haber, R.F. Fernsler, Particle Accelerators, 37-38, 161, 1992.

"The Fast Modified Betatron Accelerator." C. A. Kapetanakos, Journal of Defense Research, 21, 541, 1992.

"The MAGHIC Mode." M. Lampe, D.A. Keeley, Journal of Defense Research, 21, 455, 1992.

"The NRL 85 GHz Quasioptical Gyroklystron Experiment." R.P. Fischer, A.W. Fliflet, W.M. Manheimer, Proceedings of the 17th International Conference on Infrared and Millimeter Waves, SPIE, 1929, p. 254, 1992.\*

"Theory of Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System." C.M. Tang, J. Krall, T. Swyden, Physical Review A, 45, 7492, 1992.

"Theory of Small-Scale Density and Electric Field Fluctuations in the Nightside Venus Ionosphere." J.D. Huba, Journal of Geophysical Research, 97, 43, 1992.

"Three-Dimensional Particle Simulation of Heavy-Ion Fusion Beams." A. Friedman, D.P. Grote, I. Haber, Physics of Fluids B, 4, 2203, 1992.

"Tilted Resonator Experiments on a Quasioptical Gyrotron." T.A. Hargreaves, A.W. Fliflet, R.P. Fischer, M.L. Barsanti, W.M. Manheimer, B. Levush, T.M. Antonsen, International Journal of Electronics, 72, 807, 1992.

"Tracking and Stability in WIPS Channels:Theoretical Analysis." R.F. Fernsler, R.F. Hubbard, Journal of Defense Research, 21, 399, 1992.

"Tracking Unstable Orbits in an Experiment." I.B. Schwartz, I. Triandaf, Physical Review A, 46, 7439, 1992.

"Tracking Unstable Orbits in an Experiment." T.L. Carroll, I. Triandaf, I. Schwartz, L. Pecora, Physical Review Letters, 46, 6189, 1992.

"Tracking Unstable Steady States: Extending the Stability Regime of a Multimode Laser System." Z. Gills, C. Iwata, R. Roy, I.B. Schwartz, I. Triandaf, Physical Review Letters, 69, 3169, 1992.

"Tunable, Short Pulse Hard X-rays from a Compact Laser Synchrotron Source." P. Sprangle, A. Ting, E. Esarey, A. Fisher, Proceedings of the Workshop on Fourth Generation Light Sources, Stanford Synchrotron Radiation Laboratory, p. 289, 1992.\*

"Tunable, Short Pulse Hard X-Rays from a Compact Laser Synchrotron Source." P. Sprangle, A. Ting, E. Esarey, A. Fisher, Journal of Applied Physics, 72, 5032, 1992.

"Use of Time Domain Reflectometer Measurements on a Scale Model to Predict the Effects of a 90 Degree Bend in a Large Coaxial Pulse Forming Line." J.D. Sethian, P.A. Corcoran, Review of Scientific Instruments, 63, 2014, 1992.

"Vlasov-Maxwell Simulations of Nonlinear Plasma Dynamics in the Plasma Wakefield Accelerator." J. Krall, G. Joyce, E. Esarey, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 2563, 1992.\*

"Wavelength and Average Power Limitations in FELs," P. Sprangle, C.M. Tang, "Proceedings of the Workshop on Fourth Generation Light Sources, Stanford Synchrotron Radiation Laboratory, p. 299, 1992. \*

"X-Band Dielectric Cerenkov Maser Amplifier Experiment," H. Kosai, E. Garate, A. Fisher, W. Main, IEEE Transactions on Plasma Sciences, 20, 288, 1992.

"X-ray Lasing in an Ultra Short Pulse Laser Produced Flourine Plasma," J. Davis, R. Clark, J. Guiliani, IEEE 19th International Conference on Plasma Science, 92, 184, 1992.

"Electron-Nuclear Double Resonance of the P In Antisite in InP:Zn Detected via Luminescence," H.C. Crookham, T.A. Kennedy, Physical Review B, Vol. 46 (3), p. 1377, 1992.

"A Conference Report: Second Symposium on High Temperature Superconductors in High Frequency Fields," M. Nisenoff, Cryogenics, Vol. 32 (12), pp. 1169-1170, 1992.

"Absolute Instabilities in Gyropeneotron Amplifiers," A.K. Ganguly, Y.Y. Lau, S. Ahn, Physics of Fluids B: Plasma Physics, Vol. 4 (11), pp. 3800-3805, 1992.

"Accurate Determination of Effective Quantum Well Thickness: Infrared Absorption by Transverse-Optical Phonons," M.J. Yang, R.J. Wagner, B. Vol. Shanabrook, W.J. Moore, J.R. Waterman, M.E. Twigg, M. Fatemi, Applied Physics Letters, Vol. 61 (5), pp. 583-585, 1992.

"Alloy Ramp Heterostructure Diodes for Microwave Mixer Applications," G.B. Tait, Microwave and Optical Technology Letters, Vol. 5 (9), pp. 417-420, 1992.

"An Explanation of Anomalous Dielectric Relaxation Properties of Poly(propylene glycol)," K.L. Ngai, A. Schonhals, E. Schlosser, Macromolecules, Vol. 25 (19), pp. 4915-4919, 1992.

"Analysis of Oxygen Binding-Energy Variations for BaO on W," G.A. Haas, A. Shih, D. Mueller, R.E. Thomas, Applied Surface Science, Vol. 59, pp. 227-237, 1992.

"Anomalous Reduction of Solvent Friction in Chlorinated Biphenyl Solutions of 1, 2 - Polybutadiene," A.K. Rizos, K.L. Ngai, Physical Review B, Vol. 46, No. 13, pp. 8126-8131, 1992.

"Anomalous Splitting in the Photoreflectance Response of Semi-Insulating GaAs and Correlation with EL2," C. Durbin, J. Estrera, R. Glosser, W. Duncan, R.L. Henry, P. Nordquist, N. Bottka, D.K. Gaskill, Appl. Phys. Lett, Vol. 61 (13), p. 159, 1992.

"Bivariate Averaging Functions. Translation and Scale Autocorrelations, Fourier and Mellin Transforms, the Wiener-Khinchine Theorem and Their Inter-Relationships," A.K. Rajagopal, Pramana - J. Physics, Vol. 38 (3), pp. 233-247, 1992.

"Characterization of the Electrical Bias Induced Strain Variation in MOSFETs Using X-Ray Double Crystal Topography," D.I. Ma, S.B. Qadri, M.C. Peckerar, D.M. McCarthy, J. Vac. Sci. Technol., Vol. A 10 (4), pp. 1012-1019, 1992.

"Co, Fe, and Ti Implants in InGaAs and Co Implants in InP at 200°C," M. Vol. Rao, S.M. Gulwadi, S. Mulpuri, D.S. Simons, P.H. Chi, C. Caneau, W.-P. Hong, O.W. Holland, H.B. Dietrich, Journal of Electronic Materials, Vol. 21 (9), pp. 923-928, 1992.

"Collective Intersubband Excitations in a Magnetic Field," G. Brozak, B. Vol. Shanabrook, D. Gammon, D.S. Katzer, Superlattices and Microstructures, Vol. 12 (2), p. 251, 1992.

"Comparative Mobility Degradation in Modulation-Doped GaAs Devices After E-Beam and X-Ray Lithography." R.A. Ghanbari, M. Burkhardt, D.A. Antoniadis, H.I. Smith, M.R. Melloch, K.W. Rhee, M.C. Peckerar, J. Vac. Sci. Technol., Vol. B (10), pp. 2890-2892, 1992.

"Comparisons Between the Coupling Model Predictions, Monte Carlo Simulations and Some Recent Experimental Data of Conductivity Relaxations in Glassy Ionics." K.L. Ngai, O. Kanert, Solid State Ionics, Vol. 53-56, pp. 936-946, 1992.

"Conductance Quantization in a GaAs Electron Waveguide Device Fabricated by X-Ray Lithography." W. Chu, C.C. Eugster, A. Moel, E.E. Moon, J.A. del Alamo, H.I. Smith, M.L. Schattenburg, K.W. Rhee, M.C. Peckerar, M.R. Melloch, J. Vac. Sci. Technol., Vol. B 10(6), pp. 2966-2969, 1992.

"Correlation of the Stretch Exponent with the Decoupling Index in Ionic Glasses from the Coupling Model." K.L. Ngai, J.N. Mundy, The Physics of Non-Crystalline Solids, The Society of Glass Technology, pp. 342-346, 1992.

"DC Characteristics of High Breakdown Voltage p-i-n Diodes Made by 20-MeV Si Implantation in InP:Fe." R.K. Nadella, J. Vellanki, M. Vol. Rao, H.B. Dietrich, IEEE Electron Device Letters, Vol. 13(9), pp. 473-475, 1992.

"Density-Gradient Analysis of Field Emission from Metals." M.G. Ancona, Physical Review B, Vol. 46 (8), pp. 4874-4883, 1992.

"Determination of Band Gap and Effective Masses in InAs/Ga<sub>1-x</sub>In<sub>x</sub>Sb Superlattices." J.P. Omaggio, J.R. Meyer, R.J. Wagner, C.A. Hoffman, M.J. Yang, D.H. Chow, R.H. Miles, Applied Physics Letters, American Institute of Physics, Vol. 61 (2), pp. 207-209, 1992.

"Distribution of Ge in O<sup>+</sup> Implanted Silicon." M.E. Twigg, M.E. Zvanut, R. Stahlbush, D.J. Godbey, Jenkins, Applied Physics Letters, Vol. 61 (26), pp. 3142-3144, 1992.

"Dose Rate Independent Total Dose Failure in 54F10 Bipolar Logic Circuits." W.C. Jenkins, IEEE Transactions on Nuclear Science, Vol. 39 (6), pp. 1899-1902, 1992.

"Effects of Hydrogen Annealing on MOS Oxides." N.S. Saks, J.M. Andrews, Journal of Electronic Materials, Vol. 21 (7), pp. 775-780, 1992.

"Effects of Nonparabolicity on Collective Intersubband Excitations." G. Brozak, B. Vol. Shanabrook, D. Gammon, D.A. Broido, R. Beresford, W.I. Wang, Physical Review B, Vol. 45 (19), pp. 11399 - 11402, 1992.

"EL2 Related Anomalous Splitting in the Photorefectance Response of Semi-Insulating GaAs." C. Durbin, J. Estrera, R. Glosser, W. Duncan, R.L. Henry, P. Nordquist, N. Bottka, D.K. Gaskill, Mat. Res. Soc. Symp. Proceedings, Vol. 262, pp. 289-294, 1992.\*

"EL2-Copper Interaction in Heat-Treated GaAs." W.J. Moore, R.L. Henry, S.B. Saban, J.S. Blakemore, Physical Review B, Vol. 46, p.7229, 1992.

"Electrical Characterization of Low Temperature GaAs Layers, and Observation of the Extremely Large Carrier Concentrations in Undoped Material." B. Tadayon, M. Fatemi, S. Tadayon, F. Moore, H. Dietrich, J. Vac. Sci. Technol B, Vol. 10 (3), pp. 1074-1077, 1992.

"Electron and Hole Trapping in Irradiated SIMOX, ZMR and BESOI Buried Oxides." R.E. Stahlbush, G.J. Campisi, J.B. McKitterick, W.P. Maszara, P. Roitman, G.A. Brown, IEEE Trans. of Nuclear Science, Vol. 39 (6), pp. 2086-2097, 1992.

"Electron Tunneling Spectroscopy and Defects in GaAs/AlGaAs/GaAs Heterostructures." R. Magno, M.G. Spencer, J. Appl. Phys., Vol. 72 (11), p. 5333, 1992.

"Evaluation of Local Vibrational Mode Absorption Caused by Carbon in GaAs." S.B. Saban, J.S. Blakemore, P.E.R. Nordquist, R.L. Henry, R.J. Gorman, J. Appl. Phys., Vol. 72 (6), p. 2505, 1992.

"Evaluation of the 3-Level Charge Pumping Technique for Characterizing Interface Traps." N.S. Saks, M.G. Ancona, W. Chen, Applied Physics Letters, Vol. 60 (18), pp. 2261-2263, 1992.

"Exchange and Correlation in Quasi-Two-Dimensional Plasmas in Quantum Well Structures." D. Gammon, B. Vol. Shanabrook, J.C. Ryan, G. Brozak, D.S. Katzer, Surface Science, 263, pp. 471-474, 1992.

"Exchange and Correlation in the Nonhomogeneous Electron Gas in Semiconductor Heterojunctions." D. Gammon, B. Vol. Shanabrook, J.C. Ryan, D.S. Katzer, M.J. Yang, Physical Review Letters, Vol. 68 (12), p. 1884, 1992.

"Fabrication of Parallel Quasi-One-Dimensional Wires Using a Novel Conformable X-Ray Mask Technology." R.A. Ghanbari, W. Chu, E.E. Moon, M. Burkhardt, K. Yee, D.A. Antoniadis, H.I. Smith, M.L. Schattenburg, K.W. Rhee, R. Bass, M.C. Peckerar, M.R. Melloch, J. Vac. Sci. Technol., Vol. B 10(6), pp. 3196-3199, 1992.

"Far-Infrared Photoresponse of Granular YBa<sub>2</sub>.1Cu<sub>3</sub>.4O<sub>7-x</sub>." U. Strom, J.C. Culbertson, S.A. Wolf, F. Gao, D.B. Tanner, G.L. Carr, Physical Review B., Vol. 46 (13), p. 8472, 1992.

"Fractal Phase Space Transport Dynamics and Relaxations in Complex Correlated Systems." K.L. Ngai, S.L. Peng, K.Y. Tsang, Physica A, Vol. 191, pp. 523-531 1992..

"Fundamental Issues Confronting Models of Non-Linear Structural Relaxation." K.L. Ngai, R.W. Rendell, The Physics of Non-Crystalline Solids, The Society of Glass Technology, pp. 309-314, 1992.

"GaAs MMIC Reliability Studies." W.T. Anderson, J.A. Roussos, K.A. Christianson, Quality and Reliability Engineering International, Vol. 8, pp. 295-300, 1992.

"Ge Profile from the Growth of SiGe Buried Layers by Molecular Beam Epitaxy." D.J. Godbey, M.J. Ancona, Appl. Phys. Lett., Vol. 61 (18), pp. 2217-2219, 1992.

"Generalized Fokker-Planck Approach to the Coupling Model and Comparison with Computer Simulations." K.L. Ngai, S.L. Peng, J. Skolnick, Macromolecules, Vol. 25, pp. 2184-2191, 1992.

"High Resolution Lithography with a Vacuum STM." C.R.K. Marrian, E.A. Dobisz, Ultramicroscopy, Vol. 42 (44), pp. 1309-1316, 1992.

"High Selectivity Patterned Substrate Epitaxy of In<sub>x</sub>Ga<sub>1-x</sub>As/GaAs(0 ≤ x ≤ 1) by Conventional LPOMVPE." M.F. Zyburka, S.H. Jones, N.A. Papanicolaou, W.T. Anderson, J. Electrochemical Society, Vol. 139 (9), p. L84, 1992.

"High Temperature Characteristics of Amorphous TiSi<sub>2</sub> Nonalloyed Ohmic Contacts to GaAs." N.A. Papanicolaou, S.H. Jones, J.R. Jones, W.T. Anderson, R.S. Sillmon, J. Appl. Phys, Vol. 72 (10), pp. 4954-4957, 1992.

"High-Frequency Simulation of Semiconductor Alloy Ramp Heterostructures." G.B. Tait, C.R. Westgate, IEEE Transactions on Electron Devices, Vol. 39 (5), pp. 1063-1069, 1992.

"Hot-Electron-Induced Degradation of Front and Back Channels in Partially and Fully Depleted SIMOX MOSFET's," S. Cristoloveanu, S.M. Gulwadi, D.E. Ioannou, G.J. Campisi, H.L. Hughes, IEEE Electron Device Letters, Vol. 13 (12), pp. 603-605, 1992.

"InAlAs/InGaAs Heterojunction Bipolar Transistors with an Al/As Etch-Stop Layer." C.S. Kyono, S.C. Binari, W. Kruppa, K. Ikossi-Anastasiou, H.S. Hier, Electronics Letters, Vol. 28 (15), pp. 1388-1390, 1992.

"Infrared Absorption Due to Electron-Lattice-Vibration Scattering in AlAs/GaAs Quantum Wells." I.C. da Cunha Lima, T.L. Reinecke, Physical Review B, Vol. 46 (3), p. 1620, 1992.

"Infrared Optical Properties of Dielectric/Metal Layer Structures of Relevance to Reflection Absorption Spectroscopy," Vol. M. Bermudez, J. Vac. Sci. Technol. A, Vol. 10 (1), pp. 152-157, 1992.

"Interface Phonons of Quantum Wires," P.A. Knipp, T.L. Reinecke, Physical Review B, Vol. 45 (16), pp. 9091 - 9102, 1992.

"Interpretation of Anomalous Momentum Transfer Dependence of Local Chain Motion of Polymers Observed by Quasielastic Incoherent Neutron Scattering Experiments," K.L. Ngai, J. Colmenero, A. Alegria, A. Arbe, Macromolecules, Vol. 25 (24), pp. 6727-6729, 1992.

"Intersubband Transitions in Piezoelectric Superlattices," G. Brozak, B. Vol. Shanabrook, D. Gammon, D.A. Broido, R. Beresford, W.I. Wang, Surface Science, 267, pp. 120-123, 1992.

"Large Temperature Changes Induced by MBE Growth on Radiatively Heated Substrates," B. Vol. Shanabrook, J.R. Waterman, J.L. Davis, R.J. Wagner, App. Phys. Lett., Vol. 61 (19), p. 2338, 1992.

"Light Detection Using High -T<sub>c</sub> Microstrip Lines," J.C. Culbertson, H.S. Newman, U. Strom, J.M. Pond, D.B. Chrisey, J.S. Horwitz, S.A. Wolf, Superconducting Devices and Their Applications: Springer Proceedings in Physics, Vol. 64, p. 180, 1992.\*

"Light-Activated Resistance Switching in GaAs/AlGaAs Naturally-Occuring Nanostructures," E.S. Snow, P.M. Campbell, Superlattices and Microstructures, Vol. 11 (3), pp. 293-296, 1992.

"Magnetic Field Dependence of T<sub>c</sub> and Temperature Dependence of H<sub>c2</sub> in Layered Superconductors with Open Normal State Fermi Surface," S.S. Jha, A.K. Rajagopal, Pramana - J. Phys (Printed in India), Vol. 39 (6), pp. 615-631, 1992.

"Magnetic Resonance of X-Point Shallow Donors in AlSb:Te Bulk Crystals and AlSb MBE Layers," W. Wilkening, U. Kaufmann, J. Schneider, E. Schonherr, E.R. Glaser, B. Vol. Shanabrook, J.R. Waterman, R.J. Wagner, Materials Science Forum, Vol. 83-87, pp. 793-798, 1992.



"Metalorganic Chemical Vapor Deposition of Low Microwave Surface Resistance YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> on (100) LaAlO<sub>3</sub> and (100) SrTiO<sub>3</sub>." W.J. DeSisto, R.L. Henry, H.S. Newman, M.S. Osofsky, Vol. C. Cestone, Appl. Phys. Lett, Vol. 60 (23), p. 2926, 1992.

"Modification of the Microroughness of Molecular-Beam Epitaxially Grown GaAs/AlAs Interfaces Through Changes in the Growth Temperature." D.S. Katzer, D. Gammon, B. Vol. Shanabrook, J. Vac Sci. Technol. B, Vol. 10 (2), pp. 800-802, 1992.

"Modulated-Impurity-Concentration Transferred-Electron Devices Exhibiting Large Harmonic Frequency Content." S.H. Jones, G.B. Tait, M. Shur, Microwave and Optical Technology Letters, Vol. 5 (8), pp. 354-359, 1992.

"Non-Destructive Evaluation of Silicon-on-Insulator Substrates Using X-Ray Double Crystal Topography." D.I. Ma, G.J. Campisi, S.B. Qadri, M.C. Peckerar, J. Vac. Sci. Technol., Vol. A 10 (4), pp. 1006-1011, 1992.

"Nuclear Magnetic Resonance and Ionic Motion in Fluorozirconate Glasses," S. Estalji, R. Kuchler, O. Kanert, R. Bolter, H. Jain, K.L. Ngai, Journal de Physique IV, Vol. 2, pp. C2159-C2163, 1992.

"Numerical Analysis of Silicon-on-Insulator Short Channel Effects in a Radiation Environment." J.H. Smith, R. Lawrence, G.J. Campisi, Journal of Electronic Materials, Vol. 21 (7), pp. 683-687, 1992.

"Observation of DC and Microwave Negative Differential Resistance in InAlAs/InGaAs/InP HEMTs." W. Kruppa, J.B. Boos, Electronics Letters, Vol. 28 (3), p. 268, 1992.

"Observation of Negative Persistent Photoconductivity in an n-channel GaAs/Al<sub>x</sub>Ga<sub>1-x</sub>As Single Heterojunction." J. Chen, C.H. Yang, R.A. Wilson, M.J. Yang, Applied Physics Letters, Vol. 60 (17), pp. 2113-2115, 1992.

"Observations on the Electrical Characterization of the Heteroepitaxially Grown Cubic SiC." B. Molnar, J. Mater. Res., Vol. 7 (9), pp. 2465-2477 1992.

"Optical Absorption Due to Interface Phonons and Interface Plasmons of Quantum Dots." P.A. Knipp, T.L. Reinecke, Superlattices and Microstructures, Vol. 12 (4), p. 553, 1992.

"Optical Studies of Donors and Acceptors in Cubic SiC." J.A. Freitas, P.B. Klein, S.G. Bishop, Materials Science and Engineering, B11, pp. 21-25, 1992.

"Optically Detected Magnetic Resonance of Donor States in Al<sub>x</sub>Ga<sub>1-x</sub>As (x≥0.35) Doped with Group-IV and Group-VI Impurities." E.R. Glaser, T.A. Kennedy, Materials Science Forum, Vol. 83-87, pp. 775-786, 1992.

"Pairing in Layered Superconductors in the Presence of a Magnetic Field." A.K. Rajagopal, S.S. Jha, Physica C, Vol. 185-189, pp. 1543-1544, 1992.

"Performance of MgO/Au Cermet Films as Secondary Electron Emission Cold Cathodes." Vol. H. Ritz, A. Shih, B. Sobocinski, Surface and Interface Analysis, Vol. 18, pp. 514-524, 1992.

"Phonon Assisted Cyclotron Resonance in Quantum Wells." I.C. da Cunha Lima, A. Troper, T.L. Reinecke, Superlattices and Microstructures, Vol. 12 (3), p. 331, 1992.

"Photoemission Study of Hydrogen Adsorption on Vanadium Dioxide near the Semiconductor-Metal Phase Transition." Vol. M. Bermudez, R.T. Williams, J.P. Long, R.K. Reed, P.H. Klein, Physical Review B, Vol. 45 (16), pp. 9266-9271, 1992.

"Photoluminescence Excitation Spectroscopy of Cubic SiC Grown by Chemical Vapor Deposition on Si Substrates." J.A. Freitas, P.B. Klein, S.G. Bishop, Materials Science Forum, Vol. 83-87, pp. 1195-1201, 1992.

"Photoresponse of Shallow Step, Weak-Link Bridges Using Inverted Cylindrical Magnetron-Sputtered Y1Ba2Cu3O7-x Thin Films." E.J. Cukauskas, L.H. Allen, R.T. Holm, G.K. Sherrill, P.K. VanDamme, J. Appl. Phys., Vol. 71 (4), pp. 1878-1884, 1992.

"Post-Growth Annealing of Low Temperature-Grown Sb-Doped Si Molecular Beam Epitaxial Films." K.D. Hobart, D.J. Godbey, P.E. Thompson, Appl. Phys. Lett., Vol. 61 (1), pp. 76-78, 1992.

"Properties of 2D Electrons and Associated Bound Donors in Delta-Doped InSb," M.J. Yang, W.J. Moore, R.J. Wagner, J.R. Waterman, C.H. Yang, P.E. Thompson, J.L. Davis, Surface Science, 263, pp. 595-599, 1992.

"Proximity Effect Reduction in X-Ray Mask Making Using Thin Silicon Dioxide Layers." K.W. Rhee, D.I. Ma, M.C. Peckerar, R.A. Ghanbari, H.I. Smith, J. Vac. Sci. Technol., Vol. B 10 (6), pp. 3062-3066, 1992.

"Raman Scattering Studies of Microcrystalline Inclusions in Fluoride Glasses and Fibers," J.A. Freitas, J.S. Shanghera, U. Strom, P.C. Pureza, I.D. Aggarwal, Journal of Non-Crystalline Solids, Vol. 140, pp. 166-171, 1992.

"Real-Space Tight-Binding and Discrete Phase-Space Many-Body Quantum Transport in Granular," Nanoelectronics, F.A. Buot, Superlattices and Microstructures, Vol. 11 (1), pp. 103-111, 1992.

"Reduction of DX Centers in Superlattice Alloy-Like Material High Electron Mobility Transistors," W. Tseng, J. Pellegrino, J. Kim, R. Thurber, J. Comas, N. Papanicolaou, S. Prokes, Journal of Electrochemical Society, Vol. 139 (4), pp. 1219-1222, 1992.

"Resonant Tunneling in Coupled Quantum Dots," C.Y. Fong, J.S. Nelson, L.A. Hemstreet, R.F. Gallup, L.L. Chang, L. Esaki, Physical Review B, Vol. 46 (15), p. 9538, 1992.

"RHEED Study of Sb Incorporation During MBE Growth of GaSb and AlSb," J.R. Waterman, B. Vol., Shanabrook, R.J. Wagner, J. Vac. Sci. & Technol B, Vol. 10(2), pp. 895-897, 1992.

"Role of Hydrogen in the Growth of Y1Ba2Cu3O7 on MgO Substrates by Off-Axis Magnetron Sputtering," E.J. Cukauskas, L.H. Allen, G.K. Sherrill, R.T. Holm, App. Phys. Lett, Vol. 61 (9), pp. 1125-1127, 1992.

"Selective Removal of Si1-xGex from (100) Si Using HNO3 AND HF," D.J. Godbey, A.H. Krist, K.D. Hobart, M.E. Twigg, J. Electrochem. Soc., Vol. 139 (10), pp. 2943-2947, 1992.

"Self-Consistent Analysis of Wiggler Field Errors in Free-Electron Lasers," H.P. Freund, R.H. Jackson, Physical Review A, Vol. 45 (10), pp. 7488-7491, 1992.

"Self-Consistent Field Theory of a Helix Traveling Wave Tube Amplifier," H.P. Freund, M.A. Kodis, N.R. Vanderplaats, IEEE Transactions on Plasma Science, Vol. 20 (5), pp. 543-553, 1992.

"Silicon Cross Doping and its Effect on the Si or Be Implantation Doping of Gallium Arsenide Grown on (100) Silicon by Metalorganic Chemical Vapor Deposition," B. Molnar, P. Chi, D. Simons, J. Mater. Res., Vol. 7 (8), pp. 2186-2193, 1992.

"Site Transfer of Si in GaAs after Heavy Ion MeV Implantation and Annealing," F.G. Moore, P.B. Klein, H.B. Dietrich, J. Applied Physics, Vol. 72 (7), p. 2692, 1992.

"Solutions of the Microscopic Gorkov Equations for a Superconductor in a Strong Quantizing Magnetic Field," A.K. Rajagopal, Physical Review B, Vol. 46 (2), pp. 1224-1227, 1992.

"Space Applications of High Temperature Superconductivity: The High Temperature Superconductivity Space Experiment (HTSSE)," M. Nisenoff, FED Journal, Vol. 3 (2), pp. 12-21, 1992.

"Spectroscopic Investigation of the Er Site in GaAs:Er," P.B. Klein, F.G. Moore, H.B. Dietrich, Materials Science Forum, Vol. 83-87, pp. 665-670, 1992.

"Stress and Its Effect on the Interdiffusion in Si<sub>1-x</sub>Gex/Si Superlattices," S.M. Prokes, O.J. Glembocki, D.J. Godbey, Appl. Phys. Lett., Vol. 60 (9), p. 1087, 1992.

"Structural Relaxation and Conductivity Relaxation in Glassy Ionics," K.L. Ngai, Journal de Physique IV, Vol. 2, pp. C261-C273, 1992.

"Study of Fluorine (XeF<sub>2</sub>) Adsorption and of Oxygen/Fluorine Co-adsorption on Silicon Using Infrared Reflection Absorption Spectroscopy," Vol. M. Bermudez, J. Va. Sc. Technol. A., Vol. 0 (6), pp. 3478-3485, 1992.

"Study of the Initial Adsorption of Nitrogen on SiC(100)-(2 X 1)," Vol. M. Bermudez, Surface Science, Vol. 276, pp. 59-68, 1992.

"Study of the Initial Formation of Silicon Carbide by Reaction of Tetraethyl Silane with Silicon," Vol. M. Bermudez, J. Appl. Phys., Vol. 71 (11), pp. 5450-5459, 1992.

"The Nature of the Linear Frequency Dependent Alternating Current Conductivity Interpolating Between Conductivity Relaxation and Vibrational Responses in Alkali Oxide Glasses," K.L. Ngai, U. Strom, Physics and Chemistry of Glasses, Vol. 33 (4), pp. 1-7, 1992.

"The Navy's Role in Vacuum Tube Electronics. Part 1: The Tri-Service Program," R.K. Parker, R.H. Abrams, Microwave Journal, Vol. 35 (3), pp. 82-90, 1992.

"The Time-Dependence of Post-Irradiation Interface Trap Build-up in Deuterium-Annealed Oxides," N.S. Saks, R.W. Rendell, IEEE Transactions on Nuclear Science, Vol. 39 (6), pp. 2220-2229, 1992.

"Theory and Measurement of Quantization Effects on Si-SiO<sub>2</sub> Interface Trap Modelling," R.R. Siergiej, M.H. White, N.S. Saks, Solid-State Electronics, Vol. 35 (6), pp. 843-854, 1992.

"Time-Dependence of the Interface Trap Build-Up Deuterium-Annealed Oxides after Irradiation," N.S. Saks, R.W. Rendell, Appl. Phys. Lett., Vol. 61 (25), pp. 3014-3016, 1992.

- "Trends in the Temperature Dependency of Segmental Relaxation in TMPC/PS Blends," K.L. Ngai, C.M. Roland, J.M. O'Reilly, J.S. Sedita, *Macromolecules*, Vol. 25 (15), pp. 3906-3909, 1992.
- "Uncertainty Principle, Squeezing, and Quantum Groups," A.K. Rajagopal, *Modern Physics Letters A*, Vol. 7 (40), pp. 3759-3764, 1992.
- "Viscoelastic Properties of Amorphous Polymers. 1. Different Temperature Dependences of Segmental Relaxation and Terminal Dispersion," D.J. Plazek, X.D. Zheng, K.L. Ngai, *Macromolecules*, Vol. 25 (19), pp. 4921-4924, 1992.
- "Y1Ba2Cu3O7-x and LaA103 Composite Thin Films by Off-Axis Magnetron Sputtering," E.J. Cukauskas, L.H. Allen, R.T. Holm, G.K. Sherrill, *Appl. Phys. Lett.*, Vol. 60 (3), pp. 389-391, 1992.
- "Thermophysical Effects of Laser Radiation on Carbon Fiber Reinforced Plastic Composites," R.C. Gularte, F.R. Stonesifer, and B.J. Faraday (SFA), *High Temperatures- High Pressures*, 1992, Vol. 24, pp 625-636.
- "Energetics of Ordered Structures in Molecular," E. Kaxiras, J. Broughton, *Hydrogen*, *Europhysics Letters* 17, 191, 1992. (Not counted in Technical Output for 1992.)
- "Effects of Nonlinear Kinetic Electron Heating on Macroscopic Plasma Transport Processes," S.B. Ganguli, H.G. Mitchell, Jr., P.J. Palmadesso, *Proceedings of the SPI Conference and Reports Series*, 11, p. 197, 1992.\*
- "X-ray Lasing in an Ultra Short Pulse Laser Produced Fluorine Plasma," J. Davis, R. Clark, J. Guiliani, *IEEE 19th International Conference on Plasma Science*, 92, 184, 1992.
- "Photopumped X-ray Laser Research Using the Saturn Accelerator," J.P. Apruzese, R.W. Clark, J. Davis, T. Nash, L.E. Ruggles, R.B. Spielman, M.K. Matzen, E.J. McGuire, *CLEOS 92 Conference Proceedings*, p. 640, 1992.\*
- "Radiation Hydrodynamics of a Stagnating Ring-Puff Plasma," R.W. Clark, J. Davis, J. Les, *Proceedings of the International Conference on Lasers 91*, p. 79, 1992.\*
- "Ultra Short Pulse Laser Produced Fluorine Plasma," J. Davis, R.W. Clark, J. Guiliani, *Proceedings of the International Conference on Lasers 91*, p. 58, 1992.\*
- "The Physics and Applications of Modulated Intense Relativistic Electron Beams," M. Friedman, Vol. Serlin, Y.Y. Lau, J. Krall, *Research Trends in Physics: Nonlinear and Relativistic Effects in Plasmas*, American Institute of Physics, p. 234, 1992.
- "Present and Future Developments of High Power Relativistic Klystron Amplifiers," M. Friedman, Vol. Serlin, *Proceedings of Intense Microwave and Particle Beams III*, SPIE, 1629, p. 2, 1992.\*
- "High Frequency Operation of the Relativistic Klystron Amplifier," Vol. Serlin, M. Friedman, *Proceedings of Intense Microwave and Particle Beams III*, SPIE, 1629, p. 8, 1992.\*
- "Future Directions in Inertial Confinement Fusion," S.E. Bodner, *Proceeding of the Fusion Power Associates Annual Meeting and Symposium*, p. 562, 1992.\*

"Krypton-Fluoride Laser Fusion Development in the U.S." S.E. Bodner, R.H. Lehmberg, S.P. Obenschain, C.J. Pawley, M.S. Pronko, J.D. Sethian, A. Vol. Deniz, J.J. Hardgrove, T. Lehecka, O.C. Barr, I. Bigio, S. Czuchlewski, D. Hanson, N. Kurnit, W. Leland, J. McLeod, E. Rose, G. York, Proceedings of the Fourteenth International Conference on Plasma Physics and Controlled Nuclear Fusion Research, 2, p. 1, 1992.\*

"Relativistic Klystron Amplifiers: Research, Development, and Applications", M. Friedman, Vol. Serlin, Proceedings of the 6th National Conference on High Power Microwave Technology, p. 50, 1992.\*

"Charged Particle Beam Propagation Studies at the Naval Research Laboratory", R.A. Meger, R.F. Hubbard, J.A. Antoniadis, R.F. Fernsler, M. Lampe, D.P. Murphy, M.C. Myers, R.E. Pechacek, T.A. Peyser, J. Santos, S.P. Slinker, Proceedings of the 9th International Conference on High Power Beams, p. 99, 1992.\*

"IFR Transport Experiments on the SuperIBEX Accelerator", M.C. Myers, J.A. Antoniadis, T.A. Peyser, D.P. Murphy, R.E. Pechacek, R.F. Hubbard, R.A. Meger, Proceedings of the 9th International Conference on High Power Beams, p. 1257, 1992.\*

"Transport of High Current, Relativistic Electron Beams Using Active-Wire B" Cell Techniques" D.P. Murphy, R.E. Pechacek, J.A. Antoniadis, M.C. Myers, T.A. Peyser, R.F. Fernsler, R.F. Hubbard, J. Santos, R.A. Meger, Proceedings of the 9th International Conference on High Power Beams, p. 1251, 1992.\*

"Relativistic Electron Beam Propagation in High Pressure Gaseous Media." A. Antoniadis, M.C. Myers, D.P. Murphy, R.F. Hubbard, T.A. Peyser, R.F. Fernsler, R.E. Pechacek, J. Santos, R.A. Meger, Proceedings of the 9th International Conference on High Power Beams, p. 1245, 1992.\*

"Beam Profile Diagnostics on the NRL SuperIBEX Experiment." T.A. Peyser, M.C. Myers, R.E. Pechacek, D.P. Murphy, J.A. Antoniadis, R.A. Meger, Proceedings of the 9th International Conference on High Power Beams, p. 1263, 1992.\*

"Overview of NRL's Experimental Propagation Program," R.A. Meger, J.A. Antoniadis, R.F. Hubbard, D.P. Murphy, R.E. Pechacek, T.A. Peyser, M.C. Myers, J. Santos, J.A. Gregor, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 9, 1992.\*

"Lead Pulse Stability Experiments on SuperIBEX," J. Antoniadis, M. Myers, D. Murphy, R. Hubbard, T. Peyser, R. Pechacek, R. Meger, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 12, 1992.\*

"Optical Diagnostics on the NRL SuperIBEX Experiment," T.A. Peyser, J.A. Antoniadis, M.C. Myers, R.E. Pechacek, R. Hubbard, D.P. Murphy, R.A. Meger, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 17, 1992.\*

"Generation of 5.2 Meter Density Channels for the SuperIBEX Beam," R.E. Pechacek, D.P. Murphy, M.C. Myers, R.A. Meger, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 22, 1992.\*

"Relativistic Electron Beam Tracking of Reduced Density Channels in Normal Density Air," D.P. Murphy, R.E. Pechacek, J.A. Antoniadis, T.A. Peyser, M.C. Myers, R.F. Fernsler, R.F.

Hubbard, R.A. Meger, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 26, 1992.\*

"IFR Cell Radius Tailoring on SuperIBEX," J. Antoniadis, M. Myers, D. Murphy, T. Peyser, R. Meger, D. Murphy, R. Pechacek, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 213, 1992.\*

"Multi-Stage Gas Cell Conditioning Experiments on SuperIBEX," M. Myers, J. Antoniadis, R. Hubbard, T. Peyser, R. Meger, D. Murphy, R. Pechacek, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 218, 1992.\*

"Spectroscopic Study of Neon Transport of Intense Light Ion Beams," P.F. Ottinger, P.J. Goodrich, D.D. Hinshelwood, D. Mosher, J.M. Neri, D. Vol. Rose, S.J. Stephanakis, F.C. Young, Proceedings of the IEEE, 80, 1010, 1992.\*

"Density Measurements of Microsecond-Conduction-Time POS Plasmas," D.D. Hinshelwood, B. Vol. Weber, R.J. Commisso, P.J. Goodrich, J.M. Grossmann, J.C. Kellogg, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 603, 1992.\*

"Microsecond-Conduction-Time POS Experiments," B. Vol. Weber, J.R. Boller, R.J. Commisso, P.J. Goodrich, J.M. Grossmann, D.D. Hinshelwood, J.C. Kellogg, P.F. Ottinger, G. Cooperstein, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 375, 1992.\*

"Experimental Study of the Pinch-Beam Diode with Thin, Unbacked Foil Anodes," S.J. Stephanakis, J.R. Boller, G. Cooperstein, J.C. Kellogg, B. Vol. Weber, F.C. Young, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 871, 1992.\*

"Microsecond Plasma Opening Switch Experiments on Hawk with an E-Beam Diode Load," P.J. Goodrich, R.C. Fisher, D.D. Hinshelwood, J.R. Boller, R.J. Commisso, B. Vol. Weber, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 609, 1992.\*

"Electron and Ion Magnetohydrodynamic Effects in Plasma Opening Switches," J.M. Grossmann, C.R. DeVore, P.F. Ottinger, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 559, 1992.\*

"Transport and Focusing Considerations for Light Ion ICF Systems," P.F. Ottinger, D. Mosher, J.M. Neri, D. Vol. Rose, C.L. Olson, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 60, 1992.\*

"Simulations of a Plasma-Filled Pinched Electron Beam Diode," S.B. Swanekamp, J.M. Grossmann, P.F. Ottinger, S.J. Stephanakis, B. Vol. Weber, J.C. Kellogg, G. Cooperstein, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 1159, 1992.\*

"Radiative Z-Pinch Coupling to an Inductive Generator," J.L. Giuliani, Jr., M. Mulbrandon, R. Terry, P. Ottinger, R. Commisso, C. Deeney, P.D. LePell, Proceedings of the 9th International Conference on High-Power Particle Beams, p. 167, 1992.\*

"Spectroscopic Study of Neon Z-Pinch Plasmas for Sodium/Neon Photopumping," B.L. Welch, F.C. Young, H.R. Griem, Proceedings of the International Conference on Lasers'92, p. 105, 1992.\*

"A Nonlinear Oscillator in the Ionosphere: Beam Snapback During RF Heating," H.L. Rowland, P.A. Bernhardt, Proceedings of the SPI Conference and Reprint Series 11, p. 335, 1992.\*

"Debris and Micrometeorite Impact Measurements in the Laboratory," J. Resnick, J. Grun, J. Crawford, R. Burris, C.K. Manka, J.L. Ford, B.H. Ripin, Proceedings in the 5th Annual SOAR Conference, p. 758, 1992.\*

"Lasers, X-ray," R.C. Elton, Encyclopedia of Physical Science and Technology, 8, 671, 1992.

"Multiple-Pass Ring Amplifier for Feedback-Free Amplification of Short Pulses with High Gain and Energy Extraction Efficiency," S. Jackel, R. Burris, Proceedings of OSA on Advanced Solid-State Lasers, 13, 104, 1992.\*

"Production of a High Fluence of X-rays for Optical Component Testing, Using a Clean Laser-Produced Plasma Source," R.C. Elton, J. Grun, C.K. Manka, J. Resnick, B.H. Ripin, Proceedings of the 8th DOD Conference on DEW Vulnerability, Survivability, and Effects, p. 259, 1992.\*

"Laser," C.M. Tang, Yearbook of Science & Technology, McGraw-Hill, p. 217, 1992.

"Nonlinear Wakefields and Optical Guiding of Intense Laser Pulses in Plasmas," E. Esarey, P. Sprangle, A. Ting, Research Trends in Physics: Coherent Radiation Generation and Particle Acceleration, American Institute of Physics, p. 298, 1992.

"Stimulated Backscattered Harmonic Radiation Generated by Intense Laser Interactions with Beams and Plasmas," Esarey, P. Sprangle, Research Trends in Physics: Coherent Radiation Generation and Particle Acceleration, American Institute of Physics, p. 96, 1992.

"Advances in Hose Theory," R. Fernsler, M. Lampe, R. Hubbard, S. Slinker, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 56, 1992.\*

"Analysis of Active Wire "B" Conditioning Cells," S. Slinker, R. Fernsler, R. Hubbard, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 231, 1992.\*

"Analysis of IFR Conditioning Processes," R. Fernsler, R. Hubbard, S. Slinker, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 223, 1992.\*

"Analytic and Simulation Studies of Electron Hose Instability," M. Lampe, G. Joyce, S.P. Slinker, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 79, 1992.\*

"Long-Range Hose Simulations," R. Fernsler, S. Slinker, R. Hubbard, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 60, 1992.\*

"Options and Objectives for a Possible Precursor Bolt Flight: "-I-Bolt"-" M. Lampe, J. Antoniadis, R.F. Hubbard, G. Joyce, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 112, 1992.\*

"Review and Analysis of Propagation Experiments at NRL and Sandia," R.F. Hubbard, M. Lampe, R.F. Fernsler, S.P. Slinker, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 30, 1992.\*

"Simulation and Analysis of IFR Conditioning Cells," R.F. Hubbard, R.F. Fernsler, S.P. Slinker, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 227, 1992.\*

"Simulation and Analysis of Lead Pulse and Beam-in-Channel Experiments," R.F. Hubbard, S.P. Slinker, R.F. Fernsler, M. Lampe, D.P. Murphy, J. Antoniadis, T.A. Peyser, Proceedings of the 1991 DARPA/SDIO/ Services Annual Charged Particle Beam Program Review, p. 52, 1992.\*

"Simulation of the Low-Energy SLIA Transport Experiments," S. Slinker, G. Joyce, J. Krall, M. Lampe, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 135, 1992.\*

"SST - A Single-Slice Particle Simulation Code," G. Joyce, J. Krall, S. Slinker, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 139, 1992.\*

"Studies of the Integer Cyclotron Resonances in a Modified Betatron Accelerator," C.A. Kapetanakos, L.K. Len, T. Smith, P. Loschialpo, J. Mathew, S.J. Marsh, D. Dialetis, J. Golden, J.H. Chang, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 173, 1992.\*

"Understanding and Controlling Emittance Growth in Spiral Line Induction Accelerator Transport," J. Krall, S. Slinker, G. Joyce, M. Lampe, Proceedings of the 1991 DARPA/SDIO/Services Annual Charged Particle Beam Program Review, p. 143, 1992.\*

"A Current Loop Model of Magnetic Clouds," J. Chen, Proceedings of the First Soltip Symposium, Liblice, Czechoslovakia, Vol. 1, p. 87, 1992.\*

"Ultra-Intense Laser Interactions with Beams and Plasmas," P. Sprangle, E. Esarey, Proceedings of High-Brightness Beams for Advanced Accelerator Applications, p. 87, 1992.\*

"Beam Conditioning and Propagation Experiments on SuperIBEX," R.F. Hubbard, J.A. Antoniadis, R.F. Fernsler, M. Lampe, R.A. Meger, D.P. Murphy, M. Myers, R. Pechacek, T.A. Peyser, S.P. Slinker, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, 392, 1992.\*

"Intense Laser Pulse Propagation, Optical Guiding and Wakefield Generation in Plasma," E. Esarey, P. Sprangle, J. Krall, G. Joyce, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, 546, 1992.\*

"RF Convertor Simulation - Imposition of the Radiation Condition," D.G. Colombant, Y.Y. Lau, M. Friedman, J. Krall, Vol. Serlin, Proceedings of Intense Microwave and Particle Beams III, SPIE, 1629, 15, 1992.\*

"Beam Dynamics in the Spiral Line Induction Accelerator," S. Slinker, J. Krall, M. Lampe, G. Joyce, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 242, 1992.\*

"Efficiency and Frequency Stability in a High Power Microwave Gap," Y.Y. Lau and D.G. Colombant, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 637, 1992.\*

"Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System," C.M. Tang, J. Krall, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 1788, 1992.\*



"Observation of Plasma Wakefield Effects During High-Current Relativistic Electron Beam Transport." J.D. Miller, R.F. Schneider, K.T. Nguyen, G. Joyce, D.J. Weidman, J. Goldhar, H.S. Uhm, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 239, 1992.\*

"Reduction of Beam Breakup Growth by Bleeding Cavities in Linear Accelerators." D.G. Colombant and Y.Y. Lau, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 1609, 1992.\*

"3d and r, z Particle Simulations of Heavy Ion Fusion Beams." A. Friedman, D.P. Grote, D.A. Callahan, A.B. Langdon, I. Haber, Proceedings of 1992 Linear Accelerator Conference, p. 784, 1992.\*

"Vlasov-Maxwell Simulations of Nonlinear Plasma Dynamics in the Plasma Wakefield Accelerator." J. Krall, G. Joyce, E. Esarey, Proceedings of 1991 IEEE Particle Accelerator Conference, p. 2563, 1992.\*

"A Review of Free-Electron Lasers." C.W. Roberson, P. Sprangle, The Physics of Particle Accelerators, AIP Conference Proceedings 249, p. 914, 1992.\*

"Key Physics Issues Affecting the Performance of Free-Electron Lasers." C.M. Tang, B. Hafizi, E. Esarey, A. Ting, W. Marable, P. Sprangle, The Physics of Particle Accelerators, AIP Conference Proceedings 249, p. 1021, 1992.\*

"Design of a Quasioptical Gyrotron Pumped IR Free-Electron Laser." A.W. Fliflet, W.M. Manheimer, Proceedings of the Seventeenth International Conference on Infrared and Millimeter Waves, SPIE, 1929, p. 132, 1992.\*

"Nonlinear Analysis of a Magnicon Output Cavity." B. Hafizi, S.H. Gold, W.M. Manheimer, P. Sprangle  
Proceedings of the Seventeenth International Conference on Infrared and Millimeter Waves, SPIE, 1929, p. 62, 1992.\*

"Second Harmonic Magnicon Amplifier Experiment." S.H. Gold, C.A. Sullivan, W.M. Manheimer, Proceedings of the Seventeenth International Conference on Infrared and Millimeter Waves, SPIE, 1929, p. 60, 1992.\*

"The NRL 85 GHz Quasioptical Gyrokystron Experiment." R.P. Fischer, A.W. Fliflet, W.M. Manheimer  
Proceedings of the Seventeenth International Conference on Infrared and Millimeter Waves, SPIE, 1929, p. 254, 1992.\*

"Tunable, Short Pulse Hard X-rays from a Compact Laser Synchrotron Source." P. Sprangle, A. Ting, E. Esarey, A. Fisher, Proceedings of the Workshop on Fourth Generation Light Sources, Stanford Synchrotron Radiation Laboratory, p. 289, 1992.\*

"Wavelength and Average Power Limitations in FELs." P. Sprangle and C.M. Tang, Proceedings of the Workshop on Fourth Generation Light Sources, Stanford Synchrotron Radiation Laboratory, p. 299, 1992.\*

"High-Power Microwaves for Defense and Accelerator Applications." W.M. Manheimer, The Physics of Particle Accelerators, American Institute of Physics Conference Proceedings 249, p. 1795, 1992.\*

"Effects of Plasma Turbulence on Electron Collection by a High-Voltage Spherical Probe in a Magnetized Plasma," P.J. Palmadesso, G. Ganguli, Journal of Geophysical Research, 97, 6493, 1992.

"Diodelike Response of High-Latitude Plasma in Magnetosphere Ionosphere Coupling in the Presence of Field Aligned Currents," H.G. Mitchell Jr., S.B. Ganguli., P.J. Palmadesso, Journal of Geophysical Research, 97, 12045, 1992.

"Tracking Unstable Orbits in an Experiment," I.B. Schwartz, I. Triandaf, Physical Review A, 46, 7439, 1992.

"Tracking Unstable Steady States: Extending the Stability Regime of a Multimode Laser System," Z. Gills, C. Iwata, R. Roy, I.B. Schwartz, I. Triandaf, Physical Review Letters, 69, 3169, 1992.

"Predicting Attracting Out-of-Phase States in Coupled Josephson Junctions," I.B. Schwartz, K.Y. Tsang, International Journal of Bifurcation and Chaos, 2, 177, 1992.

"Tracking Unstable Orbits in an Experiment," T.L. Carroll, I. Triandaf, I. Schwartz, L. Pecora, Physical Review Letters, 46, 6189, 1992.

"Interhyperhedral Diffusion in Josephson-Junction Arrays," K.Y. Tsang, I.B. Schwartz, Physical Review Letters, 68, 2265, 1992.

"Small Amplitude, Long Period Outbreaks in Seasonally Driven Epidemics," I.B. Schwartz Journal of Mathematical Biology, 30, 473, 1992.

"Demonstration of Population Inversion by Resonant Photopumping in a Neon Gas Cell Irradiated by a Sodium Z Pinch," J.L. Porter, R.B. Spielman, M.K. Matzen, E.J. McGuire, L.E. Ruggles, M.F. Vargas, J.P. Apruzese, R.W. Clark, J. Davis, Physical Review Letters, 68, 796, 1992.

"Design Considerations for Z-pinch Driven Photoresonant X-ray Lasing in Neonlike Krypton," J.W. Thornhill, J.P. Apruzese, J. Davis, R.W. Clark, Journal of Applied Physics, 71, 4671, 1992.

"Improving Plasma Uniformity in Z-pinch-driven Neonlike Krypton X-ray Lasers," J.W. Thornhill, J. Davis, J.P. Apruzese, R.W. Clark, Applied Optics, 31, 4940, 1992.

"Analysis of Pumping Mechanisms Affecting the Gain of the J=0-1 and J=2-1 Lines in Neonlike Selenium,"

A. Dasgupta, K.G. Whitney, M. Blaha, M. Buie, Physical Review A, 46, 5973, 1992.

"Design Considerations for Z-pinch Driven Photoresonant X-ray Lasing in Neonlike Krypton," J.W. Thornhill, J.P. Apruzese, J. Davis, R.W. Clark, Journal of Applied Physics, 71, 4671, 1992.

"Pair Creation Collective Modes in an Electron Gas," P. Pulsifer, G. Kalman, Physical Review A, 45, 5820, 1992.

"Neon Gas Puff Implosions on a High-current Microsecond Generator With and Without a Plasma Opening Switch," C. Deeney, P.D. LePell, I. Roth, T. Nash, L. Warren, R.R. Prasad, C. McDonald, F.K. Childers, P. Sincerny, M.C. Coulter, K.G. Whitney, Journal of Applied Physics, 72, 1297, 1992.

"Measurements on Collisional Excited Soft X-ray Lasers," E.A. McLean, T.N. Lee, J.A. Stamper, C.K. Manka, H.R. Griem, .Journal of the Optical Society of America B, 9, 350, 1992

"Use of Time Domain Reflectometer Measurements on a Scale Model to Predict the Effects of a 90 Degree Bend in a Large Coaxial Pulse Forming Line," J.D. Sethian, P.A. Corcoran, Review of Scientific Instruments, 63, 2014, 1992.

"Electron Beam Tracking in a Preformed Density Channel," D.P. Murphy, R.E. Pechacek, D.P. Taggart, R.F. Fernsler, R.F. Hubbard, S.P. Slinker, R.A. Meger, Physics of Fluids B, 4, 3407, 1992.

"Demonstration of a Plasma Mirror for Microwaves," A.E. Robson, R.L. Morgan, R.A. Meger, IEEE Transactions on Plasma Science, 20, 1036, 1992.

"Channel Tracking Experiments," R.A. Meger, F.M. Bieniosek, Journal of Defense Research, 21, 417, 1992.

"Electron-Ion Hybrid Instability in Laser-Produced Plasma Expansions Across Magnetic Fields," T.A. Peyser, C.K. Manka, B.H. Ripin, G. Ganguli, Physics of Fluids B, 4, 2248, 1992.

"Railgun Recoil, Ampere Tension, and the Laws of Electrodynamics," A.E. Robson, J.D. Sethian, American Journal of Physics, 60, 1111, 1992.

"Modeling of Dynamic Bipolar Plasma Sheaths," J.M. Grossmann, S.B. Swanekamp, P.F. Ottinger, Physics of Fluids B, 4, 44, 1992.

"A New Theory of the Plasma Filled Diode," R.J. Kares, J.L. Geary, J.M. Grossmann, Journal of Applied Physics, 71, 2168, 1992.

"Ballistic Transport and Solenoidal Focusing of Intense Ion Beams for Inertial Confinement Fusion," P.F. Ottinger, D.Vol. Rose, J.M. Neri, C.L. Olson, Journal of Applied Physics, 72, 395, 1992.

"HeNe Interferometer for Density Measurements in Plasma Opening Switch Experiments," B.Vol. Weber, D.D. Hinshelwood, Review of Scientific Instruments, 63, 5199, 1992.

"Pinch Spot Formation in High Atomic Number Z-Discharges," D. Mosher, D. Colombant, Physical Review Letters, 68, 2600, 1992>

"Characterization of a Microsecond-Conduction-Time Plasma Opening Switch," R.J. Comisso, P.J. Goodrich, J.M. Grossmann, D.D. Hinshelwood, P.F. Ottinger, B.Vol. Weber, Physics of Fluids B, 4, 2368, 1992.

"Density Redistribution in a Microsecond-Conduction-Time Plasma Opening Switch," D.D. Hinshelwood, B.Vol. Weber, J.M. Grossmann, R.J. Comisso, Physical Review Letters, 68, 3567, 1992>

"Development of Wall-Stabilized Z-Discharges for Intense Ion Beam Transport in Inertial Confinement Fusion Facilities," D.D. Hinshelwood, Journal of Applied Physics, 72, 4581, 1992.

"One-Dimensional Simulations of Current-Driven Plasma Sheaths," S.B. Swanekamp, J.M. Grossmann, P.F. Ottinger, Physics of Fluids B, 4, 3608, 1992.

- "Eigenmode Analysis of Coupled Magnetohydrodynamic Oscillations in the Magnetosphere." S. Fujita, Vol. L. Patel, Journal of Geophysical Research, 97, 13777, 1992.
- "Reply to the Comments of Verheest." B.K. Som, B. Dasgupta, Vol. L. Patel, M.R. Gupta, Physics of Fluids B, 4, 1372, 1992.
- "A Low-Altitude Mechanism for Mesoscale Dynamics. Structure. Current Filamentation in the Discrete Aurora." M.J. Keskinen, P.K. Chaturvedi, S.L. Ossakow, Geophysical Research Letters, 19, 2199, 1992.
- "Anomalous Absorption of Electromagnetic Radiation." H.L. Rowland, Physics of Fluids B, 4, 3883, 1992.
- "Coupling of the Relaxation and Resonant Elements in the Autonomous Chaotic Relaxation Oscillator (ACRO)." P.A. Bernhardt, Chaos, 2, 183, 1992.
- "Electron-Ion Hybrid Instabilities Driven by Velocity Shear in a Magnetized Plasma." H. Romero, G. Ganguli, Physics of Fluids B, 4, 1708, 1992.
- "Electron-Ion Hybrid Instability in Laser-Produced Plasma Expansions Across Magnetic Fields." T.A. Peyser, C.K. Manka, B.H. Ripin, G. Ganguli, Physics of Fluids B, 4, 2448, 1992.
- "Electrostatic Turbulence in the Earth's Central Plasma Sheet Produced by Multiple-Ring Ion Distributions." J.D. Huba, J. Chen, R.R. Anderson, Journal of Geophysical Research, 97, 1533, 1992.
- "High-Latitude F Region Ionospheric Interchange Modes in the Presence of Powerful Radio Waves." P.K. Chaturvedi, M.J. Keskinen, S.L. Ossakow, Journal of Geophysical Research, 97, 8559, 1992.
- "Ion Acceleration and Coherent Structures Generated by Lower Hybrid Shear-Driven Instabilities." H. Romero, G. Ganguli, Y.C. Lee, Physical Review Letters, 69, 3503, 1992.
- "LASSII Pulsed Plasma Probe on CRRES." M.M. Baumbach, P. Rodriguez, D.N. Walker, C.L. Siefring, Journal of Spacecraft and Rockets, 29, 607, 1992.
- "Overview of the LASSII Experiment on the Combined Release and Radiation Effects Satellite." P. Rodriguez, Journal of Spacecraft and Rockets, 29, 564, 1992.
- "Preliminary Study of the CRRES Magnetospheric Barium Releases." J.D. Huba, P.A. Bernhardt, J.G. Lyon  
Journal of Geophysical Research, 97, 11, 1992.
- "Probing the Magnetosphere Using Chemical Releases from the Combined Release and Radiation Effects Satellite." P.A. Bernhardt, Physics of Fluids B, 4, 2249, 1992.
- "Skidding of the CRRES G-9 Barium Release." J.D. Huba, H.G. Mitchell, J.A. Fedder, P.A. Bernhardt  
Geophysical Research Letters, 19, 1085, 1992.
- "Theory of Small-Scale Density and Electric Field Fluctuations in the Nightside Venus Ionosphere."

J.D. Huba, Journal of Geophysical Research, 97, 43, 1992.

"Achromatism in Final Focusing Systems for High-Current Heavy-Ion Beams," D.D.-M. Ho, K.R. Crandall, I. Haber, Particle Accelerators, 37, 155, 1992.

"Analysis of the Deflection System for a Magnetic-Field-Immersed Magnicon Amplifier," B. Hafizi, Y. Seo, S.H. Gold, W.M. Manheimer, P. Sprangle, IEEE Transactions on Plasma Science, 20, 232, 1992.

"A Phase-Plate Mode Transducer for TE<sub>1n</sub> Gyrotron Modes," W.M. Black, S.H. Gold International Journal of Electronics, 72, 1119, 1992.

"Chaotic Scattering of Pitch Angles in the Current Sheet of the Magnetotail," G.R. Burkhart and J. Chen, Journal of Geophysical Research, 97, 6479, 1992.

"Conditioning Electron Beam in the Ion-Focused Regime," R.F. Fernsler, R.F. Hubbard, S.P. Slinker, Physics of Fluids B, 4, 4153, 1992.

"CPB Fire Control for Fleet Defense," E.E. Nolting, C.R. Fisher, A. Lee, M. Lampe, Journal of Defense Research, 21, 591, 1992.

"Demonstration of Vacuum Field Emission from a Self-Assembling Biomolecular Microstructure Composite,"  
D.A. Kirkpatrick, G.L. Bergeron, M.A. Czarnaski, J.J. Hickman, G.M. Chow, R. Price, B.L. Ratna, P.E. Schoen, W.B. Stockton, S. Baral, A.C. Ting, J.M. Schnur, Applied Physics Letters, 60, 1556, 1992.

"Design of an Electron Gun for a 280-GHz Inducted-Resonance-Electron-Cyclotron (IREC) Maser Experiment,"  
R.B. McCowan, R.A. Pendleton, A.W. Fliflet, IEEE Transactions on Electron Devices, 39, 1763, 1992.

"Dissipative Beam Trapping in a Modified Betatron with Strong Focusing," Y. Seo, P. Sprangle, Particle Accelerators, 39, 15, 1992.

"Effect of Energy Spread and Gyromotion on Efficiency of a Smith-Purcell FEL," B. Hafizi, P. Sprangle, P. Serafim, Nuclear Instruments and Methods A, 318, 560, 1992.

"Electron Trapping and Acceleration in a Modified Elongated Betatron," Y. Song, A. Fisher, R. Prohaska, N. Rostoker, Physics of Fluids B, 4, 3771, 1992.

"Fabrication of Biologically Based Microstructure Composites for Vacuum Field Emission," G.M. Chow, W.B. Stockton, R. Price, S. Baral, A.C. Ting, B.R. Ratna, P.E. Shoen, J.M. Schnur, G.L. Bergeron, M.A., Czarnaski, J.J. Hickman, D.A. Kirkpatrick, Materials Science and Engineering A, 158, 1, 1992.

"Fast Plasmoid Formation in Double Arcades," J.M. Finn, P.N. Guzdar, J. Chen, The Astrophysical Journal, 393, 800, 1992.

"Field-Emission Arrays - A Potentially Bright Source," C.M. Tang, A.C. Ting, T. Swyden, Nuclear Instruments and Methods A, 318, 353, 1992.

- "Flute Instability of an Ion-Focused Slab Electron Beam in a Broad Plasma." D.H. Whittum, M. Lampe, G. Joyce, S.P. Slinker, S.S. Yu, W.M. Sharp, Physical Review A, 46, 6684, 1992.
- "Generation of Stimulated Backscattered Harmonic Radiation from Intense-Laser Interactions with Beams and Plasmas." E. Esarey, P. Sprangle, Physical Review A, 45, 5872, 1992.
- "Harmonic Generation in Laser-Pumped FELs and Stimulated Backscattering from Plasmas." E. Esarey, P. Sprangle, Nuclear Instruments and Methods A, 318, 533, 1992.
- "High Current WIPS Propagation." R.L. Feinstein, R.F. Hubbard, Journal of Defense Research, 21, 369, 1992.
- "Interaction of Ultrahigh Laser Fields with Beams and Plasmas." P. Sprangle, E. Esarey, Physics of Fluids B, 4, 2241, 1992.
- "Introduction to the Propagation of Intense Electron Beams." M. Lampe, Journal of Defense Research, 21, 279, 1992.
- "Lead Pulse Stability Issues." R.F. Hubbard, W. William, M. Fawley, Journal of Defense Research, 21, 279, 1992.
- "Maximum Microwave Conversion Efficiency From a Modulated Intense Relativistic Electron Beam." D.G. Colombant, Y.Y. Lau, Physical Review A, 45, 2179, 1992.
- "Model of Cavity Coupling for Beam Breakup Control." D.G. Colombant, Y.Y. Lau, Journal of Applied Physics, 72, 3874, 1992.
- "Modeling the Longitudinal Wall Impedance Instability in Heavy Ion Beams Using an R-Z PIC Code." D.A. Callahan, A.B. Langdon, A. Friedman, D.P. Grote, I. Haber, Particle Accelerators, 37-38, 97, 1992.
- "Modified Elongated Betatron Accelerator." N. Rostoker, S. Eckhouse, A. Fisher, M. Cavenago, Journal of Defense Research, 21, 557, 1992.
- "Multimode Simulation of High Frequency Gyrotrons." S.H. Gold, A.W. Fliflet, International Journal of Electronics, 72, 779, 1992.
- "Nonlinear Analysis of a Grating Free-Electron Laser." B. Hafizi, P. Sprangle, P. Serafim, Physical Review A, 45, 8846, 1992.
- "Nonlinear Dynamics of Charged Particles in the Magnetotail." J. Chen, Journal of Geophysical Research, 97, 15011, 1992.
- "Numerical Simulation of the Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System." J. Krall, C.M. Tang, T. Swyden, Physical Review A, 46, 6750, 1992.
- "Observation of Harmonic Gyro-Backward-Wave Oscillation in a 100 GHz CARM Oscillator Experiment." R.B. McCowan, C.A. Sullivan, S.H. Gold, A.W. Fliflet, International Journal of Electronics, 72, 1033, 1992.
- "On Chaotic Conductivity in the Magnetotail." D.L. Holland, J. Chen, Geophysical Research Letters, 19, 1231, 1992.

- "Propagation and Guiding of Intense Laser Pulses in Plasmas," P. Sprangle, E. Esarey, J. Krall, G. Joyce, Physical Review Letters, 69, 2200, 1992.
- "Simulation Studies of a Klystronlike Amplifier Operating in the 10-100 GW Regime," J. Krall, M. Friedman, Y.Y. Lau, Vol. Serlin ,IEEE Transactions on Electromagnetic Compatibility, 34, 222, 1992.
- "Target Chamber Propagation of Heavy Ion Beams in the Pressure Regime Above  $10^{-3}$  Torr," R.F. Hubbard, M. Lampe, G. Joyce, S.P. Slinker, I. Haber, R.F. Fernsler, Particle Accelerators, 37-38, 161, 1992.
- "The Fast Modified Betatron Accelerator," C. A. Kapetanacos, Journal of Defense Research, 21, 541, 1992.
- "The MAGHIC Mode," M. Lampe, D.A. Keeley, Journal of Defense Research, 21, 455, 1992.
- "Theory of Electromagnetic Instability of an Intense Beam in a Quadrupole Focusing System," C.M. Tang, J. Krall, T. Swyden, Physical Review A, 45, 7492, 1992.
- "3D Particle Simulation of Beams Using the WARP Code: Transport Around Bends," D.P. Grote, A. Friedman, I. Haber, Particle Accelerators, 37-38, 131, 1992.
- "Three-Dimensional Particle Simulation of Heavy-Ion Fusion Beams," A. Friedman, D.P. Grote, I. Haber  
Physics of Fluids B, 4, 2203, 1992.
- "3D Simulation of High Gain FELs in an Optical Klystron Configuration," C.M. Tang, W.P. Marable, Nuclear Instruments and Methods A, 318, 675, 1992.
- "3D Simulations of Axially Confined Heavy Ion Beams in Round and Square Pipes," D.P. Grote, A. Friedman, I. Haber, Particle Accelerators, 37, 141, 1992.
- "Tilted Resonator Experiments on a Quasioptical Gyrotron," T.A. Hargreaves, A.W. Fliflet, R.P. Fischer, M.L. Barsanti, W.M. Manheimer, B. Levush, T.M. Antonsen, International Journal of Electronics, 72, 807, 1992.
- "Tracking and Stability in WIPS Channels:Theoretical Analysis," R.F. Fernsler, R.F. Hubbard, Journal of Defense Research, 21, 399, 1992.
- "Tunable, Short Pulse Hard X-Rays from a Compact Laser Synchrotron Source," P. Sprangle, A. Ting, E. Esarey, A. Fisher, Journal of Applied Physics, 72, 5032, 1992.
- "X-Band Dielectric Cerenkov Maser Amplifier Experiment," H. Kosai, E. Garate, A. Fisher, W. Main, IEEE Transactions on Plasma Sciences, 20, 288, 1992.
- "On the Possibility of High Power Gyrotrons for Super Range Resolution Radar and Atmospheric Sensing,"  
W.M. Manheimer, International Journal of Electronics, 72, 1165, 1992.
- "Application of Gyrotrons to High Power Millimeter Wave Doppler Radars," W.M. Manheimer, International Journal of Infrared and Millimeter Waves, 13, 1449, 1992.

"Analysis and Computations of Measurement System Effects in Ultrasonic Scattering Experiments," Robert C. Waag, Jeffrey P. Astheimer, and James F. Smith, III, J. Acoust. Soc. Am.; 91 (3), 1284-97, 1992.

"Experimental Results of Automated Aircraft Detections Using Fixed Operational Acoustic Sensors," A.A. Gerlach, E.L. Kunz, and K.D. Flowers, U.S. Journal of Underwater Acoustics 42(1), January 1992.

"Automated Detection of Acoustic Signatures Emanating from Aircraft," A.A. Gerlach and E.L. Kunz, U.S. Journal of Underwater Acoustics 42(4), October 1992.

"Comparative Performance Of Matched Mode And Matched Field Localization In A Range Dependent Environment," C. Bogart and T. C. Yang, J. Acoust. Soc. Am. 92, 2051-2068 1992.

"Surface Films and Wind-Wave Growth," Creamer, Dennis B. and J. Wright, J. Geophys. Res. 97C, 5221-5239 1992.

"Linearization Of The Matched Field Processing Approach To Acoustic Tomography" A. Tolstoy, J. Acoust. Soc. Am. 91(2) p.781-787, 1992.

"Linearization Of The Matched Field Processing Approach To Acoustic Tomography," A. Tolstoy (Invited paper), 2", International J. Modern Phys. C 4(2) p. 691-708, 1992.

"Multichannel Deconvolution of an Acoustic Transient in an Oceanic Waveguide," P.C. Mignerey and S.I. Finette, " J. Acoust. Soc. Am., Vol. 92(1), pp. 351-364, July 1992.

"Time-Frequency Analysis of Acoustic Scattering from Elastic Objects," Nai-chyuan Yen, Louis R. Dragonette, and Susan K. Numrich, J. Acoust. Soc. Am., 91, p. 2447, 1992.

"Quantum Chaos in Systems with Ray Splitting," Luise S. Schuetz, Phys. Rev. A, Nov 15, 1992.

"A Circular Passive Synthetic Array: An Inverse Problem Approach," Nai-Chyuan Yen, IEEE J. of Ocean Engrg., 17, pp. 40-47 1992.

"Radiation Or Scattering From Multiple Axisymmetric Cylinders," A. Sarkissian, J. Acoust. Soc. Am. 91, 3121-3125 1992.

"Reconstruction Of The Surface Acoustic Field On Radiating Structures," A. Sarkissian, J. Acoust. Soc. Am. 92, 825-830 1992.

"Anderson Localization Of 1-Dimensional Wave Propagation On Fluid-Loaded Structures," D. M. Photiadis, J. Acoust. Soc. Am. 91, 771 Feb 1992.

"Vein Diagram: A Simplified Version of Time-Frequency Display for Acoustic Structure Response," Nai-chyuan Yen, J. Acoust. Soc. Am. 92, p. 2474 1992.

"Acoustic Image Analysis Of Acoustic Scattering From Rigid Spheroids And Cylinders," C. F. Gaumont, A. Sarkissian, and L. R. Dragonette, J. Acoust. Soc. Am. 92 2474 1992.

"Acoustic Scattering From Multiple Rigid Cylinders," A. Sarkissian, J. Acoust. Soc. Am. 91, 2471 1992.



"Holographic Reconstruction Of The Acoustic Intensity From Measurements Over A Limited Surface." A. Sarkissian, J. Acoust. Soc. Am. 92, 2462 1992.

"Time, Frequency, And Aspect Analysis Of Bistatic Scattering From A Hemispherically End-Capped Cylindrical Shell Immersed In Water," T. Yoder, C. F. Gaumond, and A. Sarkissian, J. Acoust. Soc. Am. 92, 2462 1992.

"Acoustic Image Analysis Of Acoustic Scattering From Rigid Spheroids And Cylinders," C. F. Gaumond, A. Sarkissian, and L. R. Dragonette, J. Acoust. Soc. Am. 92, 2474 1992.

"A Two-Way Parabolic Wave Equation for Acoustic Backscattering in the Ocean," M.D. Collins, W.A. Kuperman, R. Evans, Journal Acoust. Soc. Am.; 91(3), pp. 1357-1368, March 1992.

"Nonlinear Inversion of Ocean-Bottom Properties," M.D. Collins, W.A. Kuperman, H. Schmidt, Journal Acoust. Soc. Am.; 92(5), pp. 2770-83, November 1992.

M.D. Collins, "A Self Starter for the Parabolic Equation Method," J. Acoust. Soc. Am.; 92(4), pp. 2069-74, October 1992.

"An Overview of the Critical Sea Test Program Phase One," A.C. Biondo, E.R. Bohn, F.T. Erskine, S.F. Magruder, B.K. Newhall, L.F. Rogers, G. D. Tyler, J. Underwater Acoustics; 42(2), April 1992. SECRET.

"Critical Sea Test Program Bottom Backscatter and Distant Reverberation Investigations," M.T. Sundvik, R.C. Gauss, P.M. Ogden, B.K. Newhall, F.T. Erskine, D.M. Fromm, J. Underwater Acoustics; 42(2), April 1992. SECRET.

"Introduction to the Theme Issue on Shallow-Water Acoustics," S.N. Wolf, J. Underwater Acoustics; 42(4), October 1992. SECRET

"Low Frequency Monostatic Reverberation Measured in the Shallow Water Environment of the Barents Sea," R.C. Gauss, B.H. Pasewark, J. Underwater Acoustics; 42(4), October 1992. SECRET

"Bistatic Reverberation, Target Echo, and Signal Excess Dependence on Array Types and Configurations in a Range-Dependent Shallow Water Environment," B.J. Orchard, D.M. Fromm, S.N. Wolf, J. Underwater Acoustics; 42(4), October 1992. SECRET.

"Weak Shock Interaction with a Free-Slip Interface at Low Grazing Angles," B.E. McDonald, J. Acoust. Soc. Am.; 91, pp. 718-733, 1992.

"Phase-Matching Filter Techniques for Low Signal-to-Noise Data," G.J. Orris, B.E. McDonald, and W.A. Kuperman, J. Acoust. Soc. Am., 91, 2444, 1992.

"Developments in Phase-Matching Filter Techniques," G.J. Orris, B.E. McDonald, and W.A. Kuperman, J. Acoust. Soc. Am.; 92, 2418, 1992.

"Environmental Perturbation of Ocean Waveguide Eigenmodes," B.E. McDonald, J. Acoust. Soc. Am.; 92, 2370, 1992.

"Parabolic-Equation Modeling of Global-Scale Acoustic Propagation in the Ocean Including Comparison with the Heard Island Experimental Results," M.D. Collins, K.D. Heaney, W.A. Kuperman, B.E. McDonald, A.B. Baggeroer, and P.N. Mikhalevsky, J. Acoust. Soc. Am.; 92, 2372, 1992.

"Location Of The Dust Formation Region For Mira Variables," P.F. Bowers, ApJ, 390, 27, 1992.

"VLA Observations of 1612 and 1665 MHz OH Masers Associated with IRC + 10420," G.E. Nedoluha, P.F. Bowers, ApJ, 393, 249, 1992.

"Rotation Measures of Low-Latitude Extragalactic Sources and the Magnetoionic Structure of the Galaxy," A.W. Clegg, J.M. Cordes, J.M. Simonetti, S.R. Kulkarni, ApJ, 386, 143, 1992.

"Electron Density fluctuations in the Local Interstellar Bubble," J.A. Phillips, A.W. Clegg, Nature, 360, 137, 1992.

"The Radio Appearance of Compact HII Regions: VLA Observations of G31.28+0.06, G33.92+0.11, and G34.25+0.14," A.L. Fey, R.A. Gaume, M.J. Claussen, G.E. Nedoluha, K.J. Johnston, AJ, 103, 234, 1992.

"A Radio Optical Reference Frame. IVOL. Additional Radio Source Positions in the Northern Hemisphere," A.L. Fey, J.L. Russell, C. Ma, K.J. Johnston, B.A. Archinal, M.S. Carter, E.R. Holdenried, Z. Yao, C. De Vegt, N. Zacharias, AJ, 104, 891, 1992.

"The Unusual Comet-Shaped Star-Forming Region G110-13," S. Odenwald, J. Fischer, F. Lockman, S. Stemwedel, ApJ, 397, 174, 1992.

"Multiple Jets from the Young Star IRAS 21335+5039," H.A. Smith, J. Fischer, ApJ Letters, 398, L99, 1992.

"Pulsar's Double Period Confirmed," D.C. Backer, S. Sallmen, R.S. Foster, Nature, 358, 24, 1992.

"The Distribution of the 6<sub>2</sub> - 6<sub>1</sub> and 5<sub>2</sub> - 5<sub>1</sub> Type Masers in OMC 1," K.J. Johnston, R.A. Gaume, S. Stolovy, T. Wilson, M. Walmsley & K. Menten ApJ, 385, 232, 1992.

"High Spatial Resolution 1.3 cm Imaging of the NGC-2024 Star Forming Region," R.A. Gaume, K.J. Johnston, T. Wilson, ApJ, 388, 489, 1992.

"The Internal Structure of Molecular Clouds. III. Molecular Depletion in the NGC 2024 Protostellar Condensations," R. Mauersberger, T. Wilson, P. Mezger, R.A. Gaume, K.J. Johnston, AA, 256, 640, 1992.

"Ammonia in the W3 (OH) Region," T. Wilson, R.A. Gaume, K.J. Johnston, ApJ, 402, 230, 1992.

"Dust and Gas Contributions to the Energy Output of SN 1987A on Day 1153," E. Dwek, S.H. Moseley, W. Glaccum, J.R. Graham, R.F. Lowenstein, R.F. Silverberg, R.K. Smith, ApJ, 389, 21, 1992.

"330 MHz VLA Observations of 20 Galactic Supernova Remnants," N.E. Kassim, Astronomical J., 103, 943, 1992.

"The Orbit of Phi Cygni Measured with Long-Baseline Optical Interferometry: Component Masses and Absolute Magnitudes," J.R. Armstrong, C.A. Hummel, A. Quirrenbach, D.F. Buscher, D. Mozurkewich, M. Vivekanand, R.S. Simon, C.S. Denison, K.J. Johnston, X.-P. Pan, M. Shao, M.M. Colavita, Astron. J., 104, 2217, 1992.

- "Determination of the Visual Orbit of the Spectroscopic Binary Andromedae with Submilliarcsecond Precision." X. Pan, M. Shao, M.M. Colavita, J.T. Armstrong, D. Mozurkewich, M. Vivekanand, C.S. Denison, R.S. Simon, K.J. Johnston, ApJ, 384, 624, 1992.
- "Wide Angle Astrometry with the Mark III Stellar Interferometer." M. Shao, M.M. Colavita, B.E. Hines, J.L. Hershey, J.A. Hughes, D.J. Hutter, G.H. Kaplan, K.J. Johnston, D. Mozurkewich, R.S. Simon, X.P. Pan, AJ, 100, 1701, 1992.
- "The Orbit of Alpha Equulei Measured with Long-Baseline Optical Interferometry: Component Masses, Spectral Types and Evolutionary State." J.T. Armstrong, D. Mozurkewich, M. Vivekanand, R.S. Simon, C.S. Denison, K.J. Johnston, X.P. Pan, M. Shao, M.M. Colavita, AJ, 104, 241, 1992.
- "Interferometric Observations of Mira." A. Quirrenbach, D. Mozurkewich, J.T. Armstrong, K.J. Johnston, M.M. Colavita & M. Shao AA, 259, L19, 1992.
- "On the Nature of the Molecular Cores in High-Latitude Cirrus Clouds. II -Structure, Stability, and Physical Conditions from (CO-18) Observations." B.E. Turner, L. Xu, L.J. Rickard, ApJ, 391, 158, 1992.
- "The Separation Between Gas and Dust Filaments at the Edge of the Expanding Shell in Eridanus." G.L. Verschur, L.J. Rickard, F. Verter, M.W. Pound, D. Leisawitz, ApJ, 390, 514, 1992.
- "A Radio Optical Reference Frame. III-Additional Radio and Optical Positions in the Southern Hemisphere." L. Russell, D.L. Jauncey, R.R. Harvey, G.L. White, J.E. Reynolds, C. Ma, K.J. Johnston, A. Nothnagel, G. Nicolson, K. Kingham, AJ, 103, 2090, 1992.
- "The Tycho Input Catalogue - Cross-matching the Guide Star Catalog with the Hipparcos INCA Data Base." D. Egge, P. Didelon, B. Mclean, J.L. Russell, C. Turon, A&A, 258, 217, 1992.
- "The Evolution of the Sub"Parsec Structure of 3C84 at 43 GHz." T.P. Krichbaum, A. Witzel, D.A. Graham, W. Alef, I.I.K. Pauliny-toth, C.A. Hummel, A. Quirrenbach, M. Inoue, H. Hirabayashi, M. Morimoto, A.E.E. Rogers, J.A. Zensus, C.R. Lawrence, A.C.S. Readhead, R.S. Booth, B.O. Ronnang, A.J. Kus, K.J. Johnston, J.H. Spencer, B.F. Burke, Vol. Dhawan, I.I. Shapiro, N. Bartel, A. Aolberdi, J.M. Marcaide, A&A, 260, 33-48, 1992.
- "Full Evolution of the 6 & 20 cm Radio Emission from SN1980K." K.W. Weiler, S.D. Van Dyk, N. Panagia, R.A. Sramek, Astrophys. J., 398, 248, 1992.
- "The 20 & 6 cm Radio Light Curves for SN1981K: A Type II Radio Supernova." S.D. Van Dyk, K.W. Weiler, R.A. Sramek, N. Panagia, Astrophys. J., 396 195, 1992.
- "On the Use of Supernovae as Radio-Optical Astrometric Fiducial Points." K.W. Weiler, K.J. Johnston, S.D. Ban Dyk, Publ. Astron. Soc. Pacific, 104, 246, 1992.
- "Evidence for Periodic Modulation of Presupernova Mass Loss from the Progenitor of SN1979C." K.W. Weiler, S.D. Van Dyk, J.E. Pringle, N. Panagia, Astrophys. J., 399, 672, 1992.
- "SEST CO Observations of Galaxies in the Grus Quartet - NGC 7582 and NGC 7552." M.J. Claussen, R. Sahai, AJ, 103, 1134, 1992.
- "1612 MHz OH Maser Emission from Axisymmetric Circumstellar Envelopes: Miras." A.J. Collison, J.D. Fix, ApJ, 390, 191, 1992.

"Association of Supernovae with Regions of Star Formation in Late Type Galaxies," S.D. Van Dyk, AJ, 103, 1788, 1992.

"Diffraction-Limited Imaging with Partially Redundant Masks - I. Infrared Imaging of Bright Objects," C.A. Haniff, D.F. Buscher, J. Opt. Soc. Am. A, 9, 203, 1992.

"Astronomical Observations at 10 and 20 Microns with the NRL Infrared Camera," S. Odenwald, K. Shivanandan, H.A.J. Thronson, PASP, 104, 127, 1992.

"An Examination Of Four- Dimensional Data-Assimilation Techniques For Numerical Weather Prediction," Harms, D.E., S.Raman and Madala, R.Vol. , B. American Meteorological Society. Vol. 73, No. 4, Pages 425-440, 1992.

"Storm Structure Analysis Of Hurricane Hugo Of 1989 Using Special Sensor Microwave/Imager Data," R. Alliss, S. Raman, S.W. Chang, ReVol., 120, 2723-2737, 1992.

"Nonaxisymmetrix Waves of a Stratified Vertical Vortex," Fung, Y.T., J. App. Mechanics. Vol. #59, 445-449, 1992.

"Storm Structure Analysis of Hurricane Hugo via Passive Microwave Radiometry," R. Aliss, S. Chang, S. Raman and G. Sandlin, Proceedings of 6th Conference on Satellite Meteorology and Oceanography, 1992.\*

"High Resolution Measurement of Surface-Active Materials in a Ship Wake," R.D. Peltzer, O.M. Griffin, J.A.C. Kaiser and W. R. Barger, Journal of Geophysical Research, Vol. 97(C4), 5231-5252, 1992.

"Remote Sensing of Surface Ship Wakes," O.M. Griffin, R.D. Peltzer, A.M. Reed and R.F. Beck, Naval Engineers Journal, Vol. 104, 245-258, 1992.

"Time Domain Solutions for the Motion of Directional Wave Buoys," H.T. Wang and J.W. Leonard, Proceedings of the 1992 OMAE, Vol. I-A, June 1992, pp. 127-133.\*

"The Millimeter-Wave Atmospheric Sounder (Mas): A Shuttle-Based Remote Sensing Experiment," Croskey, C.L., N. Kaempfer, R.M. Bevilacqua, G.K. Hartmann, K.F. Kunzi, P.R. Schwartz, J.J. Olivero, S.E. Puliafito, C. Aellig, G. Umlauf, W.B. Waltman, W. Degenhardt, IEEE Trans. on Microwave Theory and Techniques, 40, 1090-1100, 1992.

"Infrared Emissivity of Water Clouds," P.Chylek, P.Damiano, & E.P.Shettle 1992. J. Atmos. Sci., 49, 1459-1472.

"Principal Component Transformation Of Multi-Frequency Polarimetric Sar Imagery," J.S. Lee and K. Hoppel, IEEE Trans. Geoscience and Remote Sensing, Vol. 30, no. 4, July 1992.

"Segmentation of SAR Image Using the Wavelet Transform," L.J. Du, J.S. Lee, K. Hoppel and S.A. Mango, International Journal of Imaging System and Technology, Vol. 4, 319-329, 1992.

"Unsupervised Speckle Noise Modelling of Radar Images," J.S. Lee, K. Hoppel, and S. Mango, International Journal of Imaging System and Technology, Vol. 4, 298-305, 1992.

"A Wavetank Study of the Dependence of X-Band Cross Sections On Wind Speed And Water Temperature," M.R. Keller, W.C. Keller, and W.J. Plant, J. Geophys. Res., 97, pp. 5771-5792, 15 Apr 1992.

"Resonant Excitations of Ions Channeled in Quasicrystal Structures," R. Fusina, J.C. Kimball, Phys. Rev B, 45, 448, Jan 1992.

"A Feature Model Of The Iceland-Faeroe Front For Application In The U.S. Navy Optimum Interpolation-Based Thermal Analysis System," Bennett, T., J. Boyd, L. Knauer, G. Dawson, and W. Wilson, J. Marine Technol. Soc., 26, 44-52, 1992.

"An Ice-Ocean Model For The Northern Hemisphere," Cheng, A. and R.H. Preller, Geophys. Res. Letters, 9, pp. 901-904, 1992.

"Quantification Of Improvements In An Operational Global-Scale Ocean Thermal Analysis System," Clancy, R.M., J.M. Harding, K.D. Pollak, and P. May, J. Atmos. Oceanic Technol., 9, pp. 55-66, 1992.

"Characterizing Major Frontal Systems: A Nowcast/Forecast System For The Northwest Atlantic," Fox, D.N., M.R. Carnes, and J.L. Mitchell, Oceanography, 5, pp. 49-54, 1992.

"A Seasonal Skill Comparison Between Operational Ocean Thermal Structure Products In The Ne Atlantic/ Norwegian Sea," Harding, J.M., P. May, K.D. Pollak, and R.M. Clancy, J. Marine Technol. Soc. 26, 15-22, 1992.

"Simulation Of Geosat, Topex/Poseidon, And Ers-1 Altimeter Data From A 1/8 Degree Pacific Ocean Model: Effects Of Space-Time Resolution On Mesoscale Sea Surface Height Variability," Hogan, P.J., H.E. Hurlburt, G.A. Jacobs, A.J. Wallcraft, W.J. Teague, and J.L. Mitchell, Mar. Technol. Soc. J., 26(2), 98-107, 1992.

"Modeling Of The Global And Pacific Oceans: On The Path To Eddy-Resolving Ocean Prediction," Hurlburt, H.E., A.J. Wallcraft, Z. Sirkes, and E.J. Metzger, Oceanography, 5, 9-18, 1992.

"Circulation In The Gulf Of Mexico From Geosat Altimetry During 1985-86," Johnson, D., J.D. Thompson, and J. Hawkins, J. Geophys. Res. 97 (C2), pp. 2201-2214, 1992.

"Hindcasting Of Wind-Driven Anomalies Using A Reduced-Gravity Global Ocean Model," Metzger, E.J., H.E. Hurlburt, J.C. Kindle, Z. Sirkes, and J.M. Pringle, Mar. Technol. Soc. J., 26(2), 23-32, 1992.

"Sea Ice Prediction: The Development Of A Suite Of Sea-Ice Forecasting Systems For The Northern Hemisphere," Preller, R.H., Oceanography, 5, pp. 64-68, 1992.

"On The Sverdrup Circulation For The Atlantic Along 24 N. Jgr Oceans," Schmitz, W.J., Jr., J.D. Thompson, and J.R. Luyten, 97,7251-7256, 1992.

"Ocean Prediction And The Atlantic Basin: Scientific Issues And Technical Challenges," Thompson, J.D., T.L. Townsend, A.J. Wallcraft, and W.J. Schmitz, Jr., Oceanography, 5, 36-41, 1992.

"An Electrochemical and Surface Analytical Study of Stainless Steels and Titanium Exposed to Natural Seawater," Little, B., R. Ray, P. Wagner, F. Mansfeld, R. Tsai, and H. Shih Corrosion Science 32(3), 1992.

"On the Fall Rate of the Expendable Bathythermograph (XBT)," Hallock, Z. and W. Teague . J. Atmos. Ocean. Tech. 9(4) pp470-483, 1992.

"Effect of Photosynthetic Biofilms on the Open-Circuit Potential of Stainless Steel." Little, B., N.J.E. Dowling, J. Guezennec, J. Bullen and D.C. White *Biofouling* 5, pp315-322, 1992.

"An Overview of Microbiologically Influenced Corrosion." Little, Brenda, P.A. Wagner and F. Mansfeld *Electrochimia Acta* 37(12) pp. 2185-2194, 1992.

"Hindcasting of Wind-Driven Anomalies Using a Reduced-Gravity Global Ocean Model." Metzger, E.J., H.E. Hurlburt, J.C. Kindle, Z. Sirkes, and J.M. Pringle *Mar. Technol. Soc. J.*, 26(2), pp. 23-32, 1992.

"A Field Evaluation of New Satellite-Tracked Buoys: A Loran-C Position Recording and a Sonobuoy Type Drifter." Pickett, R.L. and M. McCormick, *MTS Journal*, 25(2), pp. 39-33, 1992.

"A Feature Model of the Iceland Faeroe Front." Bennett, T., Jr., J.D. Boyd, L. Knauer, G. Dawson, and W. Wilson *Marine Tech. Soc. J.*, 26(2), pp. 44-52, 1992.

"Effect of Photosynthetic Biofilms on the Open-Circuit Potential of Stainless Steel." Dowling, N.J.E., J. Guezennec, J. Bullen, B. Little, and D.C. White *Biofouling*, 5 pp. 315-325, 1992.

"Polynomial Trend Surface Analysis Applied to AVHRR Images To Improve Definition of Arctic Leads Through Binary Segmentation Procedures." Eppler, D.T., and D.P. Winebrenner, *Remote Sens. Environ.* 40:197-218, 1992.

"Passive Microwave Observations of Lake Ice Fractures and Snow Distribution: Harding Lake, Alaska." Eppler, D.T., R.A. Melloh, L.D. Farmer, and L.W. Gatte *Am. Arctic Res.*, 1992.

"AVHRR Workshop Summary: Ice Concentration" Eppler, Duane S., *Annals of Glaciology*, 1992.

"The Fall Rate of the T-7 XBT." Hallock, Z.R., *J. Atmos. Oc. Tech.*, 9(4), pp. 470-483, 1992.

"The Fall Rate of the T-7 XBT." Hallock, Zachariah R. and William J. Teague, *J. Atmos Oc. Tech.* 9, 1992.

Simulation of GEOSAT, TOPEX/Poseidon, and ERS-1 Altimeter Data From a 1/8 Pacific Ocean Model: Effects of Space-Time Resolution on Mesoscale Sea Surface Height Variability." Hogan, P.J., H.E. Hurlburt, G.A. Jacobs S, A.J. Wallcraft, W.J. Teague, and J.L. Mitchell, *Mar. Techn. Soc. J.*, 26(2), pp. 98-107, 1992.

"Remote Wind-Forcing in the Northwest Atlantic." Johnson, Donald and Zachariah Hallock *J. Geo. R.*, 1992.

"Computerized Oceanic Particle Characterization Using Heavy Metal Stainings. SEM, EDXS and Image Analysis." Lavoie, Dennis M., *Deep Sea Research*, 39(0) pp. 1655-1668, 1992.

"Test Methods for Microbiologically Influenced Corrosion in Marine Environments." Wagner, P.- (with) B. Little and F. Mansfeld, *Material Science Forum*, Vol. S 111-112, pp. 1-24.

"Iridium Oxide pH Microelectrode 1992." Little, Brenda, *Biotechnology and Bioengineering*, 40 p. 601-608, 1992.

- "An Overview of Microbiologically Influenced Corrosion of Metals and Alloys." Little, Brenda, Patricia Wagner, and Florian Mansfeld, *Electrochimica Acta*, 37(12), pp. 2185-2194, 1992.
- "Test Methods for Microbiologically Influenced Corrosion in Marine Environments." Little, B., P. Wagner, and F. Mansfeld, *Metals Science Forum*, 111-112, pp1-24, 1992.
- "An Electrochemical and Surface Analytical Study of Stainless Steels and Titanium Exposed to Natural Seawater." Little, B., F. Mansfeld, R. Tsai, H. Shih, R. Ray, and P. Wagner, *Corrosion Science*. 33(3), pp445-456, 1992.
- "Construction and Application of Iridium Oxide pH Microelectrode." Little, B., Z. Lewandowski, W. Characklis, and W. Lee, *J. Bioeng. Biotech.*, 40, pp. 601-608, 1992.
- "Effect of Photosynthetic Biofilms on the Free Corrosion Potential of Stainless Steel." Little, B., N.J.E. Dowling, J. Guezennec, J. Bullen, and D.C. White, *Biofouling*, 5, pp. 315-322, 1992.
- "Corrosion Mechanisms for Copper and Silver Objects in Near Surface Environments." Little, B. and M. McNeil, *J. of Am. Inst. Conser*, Vol. 31(3), 1992.
- "Metals and Microbes--They're the Pits." Little, B, *Offshore Observations*, January, pp. 1-4, 1992.
- "Microbiologically Influenced Corrosion of Copper-Based Materials Exposed to Natural Seawater." Mansfeld, F. and B. Little, *Electrochimica Acta*, 37(12), pp. 2291-2297, 1992.
- "Hindcasting of Wind Driven Anomalies Using a Reduced Gravity Global Ocean Model." Metzger, E.J., H.E. Hurlburt, J.C. Kindle, Z. Sirkes, and J.M. Pringle, *Mar. Technol. Soc. J.*, 26(2), pp. 23-32, 1992.
- "Transport of the Norwegian Atlantic Current as Determined From Satellite Altimetry." Pistek, P. and D.R. Johnson *Geophys. Res. Letts.*, 19, pp. 1379-1382, 1992.
- "A Study of the Iceland-Faeroe Front Using GEOSAT Altimetry and Current-Following Drifters." Pistek, Pavel and Donald R. Johnson, *Deep-Sea Research*, 39, pp. 2059-2051, 1992.
- "Raman Scattering in Ocean Optics: Quantitative Assessment of Internal Radiant Emission." Stavn, Robert Hans and Alan Dean Weidemann, *Applied Optics*, 31, 1992.
- "Radiant Emission," Robert Hans, *Applied Optics*, 31, No. 9, March, 1992.
- "A Large Moored Tripod." Fagot, M. G. and Swenson, R. C., *Technology Society*, MTS '92 global Ocean Partnership, October 19-21, 1992.
- "Embedded Training Capabilities for the Lamps MKIII." Romalewski, R., and Hammond, J. H., *Proceedings NAVAIR Weapons Training Expo*, p.46-54, January 1992\*.
- "Exploiting Bathymetry to Enhance Surface Duct Performance of Active ASW Sonars in Shallow Water." Handschumacher, D., R. Goodman and W. Sawyer, *Proceedings TTCP Sonar Technology Symposium*, NUSC, New London, 1992, *Classified Proceedings Book*.\*
- "The bathymetry and distribution of the Bahia Seamounts, Brazil Basin." Cherkis, N.Z., D.A. Chayes, and L.C. Costa, *Marine Geology*, 103, 335-347, 1992.

"Morphology And Tectonics Of The Mid-Atlantic Ridge (25°-27°30's) From Sea Beam And Magnetic Data." Grindlay, N.R., P.J. Fox, and P.R. Vogt, J. Geophys. Res., B, 97, 6983-7010, 1992.

"Predicting Bathymetry From Geosat-Erm And Shipboard Profiles In The South Atlantic Ocean." Jung, W-Y., and P.R. Vogt, Tectonophys., 210, 235-253, 1992.

"Structure Of The Variscan Belt Beneath The British And American Overlap Sequences." LeFort, J.P. and M.D. Max, Geology 20, 979-982, 1992.

"Bedrock Geology of North Mayo (Scale 1:100,000)." Max, M.D., C.B. Long, and MacDermot, Map (One sheet), Geol. SurVol. C.Vol., Ireland, Dublin; 1992.

"Geological Control Of Shallow Gas And Pockmarks In The Norwegian Channel: High Resolution Shallow Subbottom Profiling Of Small Scale Features." Max, M.D., R. Schreiber, and N.Z. Cherkis, Mar. Geophys. Res., 14, 77-85, 1992.

"Discussion On The Inishkea Division Of Northwest Mayo Dalradian Cover Rather Than Pre-Caledonian Basement (Ireland)." Max, M.D. and J.A. Winchester, Journal Geol. Soc. London 149, 167-170, 1992.

"Does The Birchy Complex Extend Into Ireland?," Winchester, J.A., H. Williams, M.D. Max and C.R. van Staal, Journal Geol. Soc. London, 149, 159-162, 1992.

"A Computer-Simulation Study of Sticks Percolation." Becklehimer, J.L., and R.B. Pandey, Physica A, 187, p. 71-76, 1992.

"High-Frequency Bottom Backscattering: Roughness Vs. Sediment Volume Scattering." Jackson, D.R. and K.B. Briggs, Journ. Acoust. Soc. Am., 92: p. 962-977, 1992.

"Argo Abyssal Plain Magnetic Lineations Revisited: Implications for the Onset of Seafloor Spreading and Tectonic Evolution of the Eastern Indian Ocean." Sager, W.W., L.G. Fullerton, R.T. Buffer and D.W. Handschumacher, Proc. Ocean Drilling Program, Sci. Results, Vol. 123, Gradstein, 1992.\*

"Dependence of Ocean Heating on the Distribution of Spectral Irradiance in the North Atlantic." Arnone, B., SPIE, Proceedings, Vol. 1749 Optics of the Air-Sea Interface 1992., pgs. 73-82, 1992.\*

"An Ocean Bottom Magnetometer System for Continental Shelf Measurements," Avera, W., Sea Technology, June 1992.

"Acoustical Boundary Location Through Texture Analysis of Multibeam Bathymetric Sonar Imagery." Barad, H., Accepted for publication in MTS Journal.

"Neural Network Parameter Estimation for the Modified Bistatic Scattering Strength Model (BISSM2)." Bourgeois, B., Oceanic Engineering Society of IEEE -Oceanic Engineering, October 1992.

"Estimators of Bottom Reflectance Spectra." Estep, L., International Journal of Remote Sensing, Vol. 13, No. 2, 393-397), 1992.

"Experimental Validation of the Single Scattering Irradiance (SSI) Model. The Hydrographic Journal," No. 64, Estep, L., April 1992.



"A Coupled Regional Tide Model." Hsu, L., Marine Technology Society Journal, Vol. 26, No. 2, Summer 1992.

"Methods of Measuring Wind Stress over a Water Surface - Discussions of Displacement Height and Von Karman Constant." Hsu, L., Boundary-Layer Meteorology 58: 51-68, 1992.

"Signals and Noise in Magnetic Observatory Annual Means: Mantle Conductivity and Jerks." McLeod, M., Journal of Geophysical Research, 97, pgs. 17261-17290, November 10, 1992.

"Magnetospheric and Ionospheric Signals in Magnetic Observatory Monthly Means." McLeod, M., EOS, Trans. A. Geophys. Un., 73, Supplement, 432-433, 1992.

"Signals and Noise in Magnetic Observatory Annual Means." McLeod, M., EOS Trans. Am. Geophys. Un. 73, Supplement, pp. 99, 1992.

"Estimators Of Bottom Reflectance Spectra." Int. J. Remote Sensing, Estep, L., Vol. 13, pgs. 393-397, 1992.

1993

d. refereed journals  
1993:

"Identification of Toroidal Field Errors in a Modified Betatron Accelerator." P. Loschialpo, S. J. Marsh, L. K. Len, T. Smith, C. A. Kapenntanakos, Rev. Sci. Inst. 64, 1425 (1993).

"Optical Technology for Information Access at the NRL Library." Folen, Doris R. and Laurie E. Stackpole, Microcomputers for Information Management 10, Number 4, pp 281-291, December 1993.

"Optical Storage and Retrieval of Library Material." Folen, Doris R. and Laurie E. Stackpole, Information Technology and Libraries 12, Number 2, pp. 181-191, June 1993.

"A Time Domain Model for Sea Scatter." L. B. Wetzel, Journal Article dtd 1993 Radio Science, Volume 28, pp. 139-150, 1993.

"Statistical Moments of Radar Cross Section." W. B. Gordon, IEEE Trans. on Antenna Propagat., Vol. 41, No. 4, pp. 506-508, April 1993.

"Collective Recall Via the Brain-State-in-a-Box Network." A. Schultz, IEEE Trans. on Neural Network, Vol. 4, No. 4, pp. 580-587, June 1993.

"A Good Approximation of Pulse Compression Degradation due to Adaptive Cancellation." K. Gerlach, IEEE Trans. on AES, Vol. 29, No. 1, pp. 271-278, January 1993.

"Robust Locally Optimum Detection of Signals in Dependent Noise." K. R. Gerlach and K. J. Sangston, IEEE Trans. on Information Theory, Vol. 39, No. 3, pp. 1040-1043, May 1993.

"Behavior of a Received Pulse Radiated By a Half-Wave Dipole Excited by a Single-Cycle Sinusoidal Voltage." S. N. Samaddar, Journal of the Franklin Institute, Vol. 330, NO. 1, pp. 17-28, February 1993.

"Behavior of the Energy Density in the Fresnel Region of a conducting circular disk excited by Single-Cycle Sinusoids." S. N. Samaddar, Journal of Applied Physics, Vol. 74, No. 5, pp. 3013-3023, 1 September 1993.

"Ultra-Wideband Radar Studies of Steep Crested Waves with Scanning Laser Measurements of Wave Slope Profiles." D. Trizna, P. Hwang and J. Wu, Dynamics, Atmospherics and Oceans, Vol. 18, No. 5, October 1993.

"Design Of Broad-Band Radar Absorbing Materials For Large Angles Of Incidence." L. S. Cohen with J. Perini, IEEE Trans. on Electromagnetic Compatibility, Vol. 35, No. 2, pp. 223-230, May 1993.

"Ionospheric Scintillation-Induced Integration Losses for Space-Based Radar." E. Mokole and D. Knepp, IEEE Trans. on AES, Vol. 29, No. 3, pp. 636-649, July 1993.

"Exact Results For The Grazing Angle Of Specular Reflection From A Sphere." A. Miller, E. Vegh, Journal Industrial and Applied Mathematics, Vol. 35, No. 3, pp. 472-480, September 1993.

\* Believed to be Peer-Reviewed.

"Test and Evaluation by Genetic Algorithms." Alan C. Schultz, John J. Grefenstette, and Kenneth A. De Jong, IEEE Expert, v8, n5, 9-14, October 1993.

"Study of Interval Belief Combination." Rangasami L. Kashyap and Liwu Chang, Journal of Intelligent and Robotic Systems, 7, 1-13, 1993.

"Application of a Real-Time Control Strategy for Bayesian Belief Networks to Ship Classification Problem Solving." Scott Musman, Liwu Chang and Lashon B. Booker, International Journal of Pattern Recognition and Artificial Intelligence, v7, n3, World Scientific Publishing, 1993.

"Adding Speech Recognition to a Natural Language Interface." Stephanie S. Everett, Kenneth Wauchope, and Dennis Perzanowski, Journal of the American Voice I/O Society, v14, 41-52, August 1993.

"Maintaining Multilevel Transaction Atomicity in MLS Database Systems with Replicated Architecture." Myong Kang, The Seventh IFIP Working Conference on Database Security, 1993.\*

"A Pump for Rapid, Reliable, Secure Communication." Myong Kang, The First ACM SIGSAC Conference, 1993. \*

"Using Object Modeling Techniques to Design MLS Data Models." Myong Kang, OOPSLA-93 Conference Workshop on Security for Object-Oriented Systems (1993). Also Springer Verlag (London Ltd) , 1993/1994.

"MT: A Toolset for Specifying and Analyzing Real-Time Systems." C. Clements, C. L. Heitmeyer, B. G. Labaw, A. T. Rose, Proc., Real-Time Systems Symposium, Dec., 1993.\*

"Comparing Different Approaches for Specifying and Verifying Real-Time Systems." C.L. Heitmeyer, R. D. Jeffords, B. G. Labaw, Proc., Tenth IEEE Workshop on Real-Time Operating Systems and Software, IEEE CS Press New York, NY., May 13-14, 1993.\*

"Applying Formal Methods to an Embedded Real-Time Avionics System." C. Clements, C. L. Heitmeyer, B. G. Labaw, A. K. Mok, Proc., First IEEE Workshop on Real-Time Applications, New York, NY, May 11-12, 1993.\*

"In Introducing Noise into the Bus-Contention Channel." James W. Gray, III, Proc. IEEE Computer Society Symposium on Research in Security and Privacy, IEEE Press, 1993.\*

"On Analyzing the Bus-Contention Channel under Fuzzy Time." James W. Gray, III, Proc. The Computer Security Foundations Workshop VI, IEEE Press, 1993.\*

"New Paradigms for High Assurance Software." John McLean, New Security Paradigms Workshop, ACM Press, 1993.\*

"Models of Confidentiality: Past, Present, and Future." John McLean, Proceedings of the IEEE Computer Security Foundations Workshop VI, IEEE Press, 1993.\*

"Composable Systems: Position Paper." John McLean, Proc. National Computer Security Conference, 1993.\*

"Integrating Specifications. Integrating Assurances." McLean, J., Proceedings of the 16th National Computer Security Conference, 1993.\*

"An Outline for a Taxonomy of Computer Security Research." Catherine Meadows, An Outline for a Taxonomy of Computer Security Research New Security Paradigms Workshop, ACM Press, 1993.

"A Logical Language for Specifying Cryptographic Protocol Requirements." Paul Syverson and Catherine Meadows, Proceedings of the 1993 IEEE Symposium on Research on Security and Privacy, IEEE Press, 1993.\*

"On Key Distribution Protocols for Repeated Authentication." Syverson, P., Operating Systems Review, vol. 27, no. 4, pp. 24-30., October 1993.

"Adding Time to a Logic of Authentication." Syverson, P., ACM Press Proceedings of the First ACM Conference on Computer and Communications Security, 1993.\*

"A Pump or Rapid. Reliable. Secure Communication." Moskowitz, I.(with Myong Kang), Proceedings of the First ACM Conference on Computer and Communications Security ACM Press, 1993.\*

"Visualizing Fluid Flow." Rosenblum, L.J. and F. Post, COMPUTER, Vol. 26, No. 6, 98-100, June 1993.

"Radar Modeling For Strike Warfare Decision Aids." Miguel R. Zuniga, Jeffrey K. Uhlmann, James B. Hofmann, 10th Annual Conference for Command and Control Decision Aids, Washington, DC, July 1, 1993.\*

"An Overview of the Processing Graph Support Environment." Roger Hillso, Proceedings of the 1993 Complex Systems Engineering Synthesis and Assessment Technology Workshop (CSESAW 93), 20-22, July 1993.\*

"An Overview of the Processing Graph Support Environment." Dr. Roger. Hillson, Proceedings of the 1993 Complex Systems Engineering Synthesis and Assessment Technology Workshop (CSESAW '93), pp 49-55, July 20-22, 1993.\*

"A Revised Clustering Technique Using A Hopfield Network." Behrooz Kamgar-Parsi and Behzad Kamgar-Parsi, Proc. World Congress on Neural Networks (WCNN '93), Portland, OR, vol. 4, pp. 24-27, July 1993.

"A Cellular Automaton Methodology for Solving the Wave Equation." J. Cole, R.A. Krutar, D. B. Creamer, S.K. Numrich, Proc. 7th International Conference on Supercomputing, Tokyo, July 1993.\*

"A Nearly Exact Second Order Finite Difference Wave Propagation Algorithm on a Course Grid." J.B. Cole, Computer in Physics, July 1993.\*

"A Cellular Automaton Algorithm for Time-Domain Simulation and Visualization of Wave Propagation." B. Cole, R. A. Krutar, D. B. Creamer, S. K. Numrich, Computer in Physics, October 20, 1993.\*

"3D Acoustic Imaging With A Thin Lens." B. Johnson, D. Scroggins, D. Folds, Behzad Kamgar-Parsi, and E. Belcher, Proc. Oceans '93 Conference, Vancouver, BC, , vol. 3, pp. 444-449, October 1993.

"Computation of Acoustic Fields on a Massively Parallel Processor Using Lattice Gas Methods." S. K. Numrich, R. A. Krutar, R. Squier, Proceedings of the Third IMACS Conference on Computational Acoustics, June 26-28, Cambridge, Mass. 1991, published in Computational Acoustics Volume 1: Scattering, Supercomputing and Propagation, R. L. Lau, D. Lee, A.R. Robinson, ed. North Holland, New York, pp. 81-92, 1993.\*

"Momentum Transfer in Sheared Liquid Mixtures." W. C. Sandberg U. Obeysekare, Abstract Submitted for the Physics Computing 93 Meeting of the American Physical Society, May 31, 1993.

"Studies Of Turbulent Oxyacetylene Flames Used For Diamond Growth." C. Marks, H. Burris, J. Grun, and K. Snail, submitted to J. Appl. Phys. vol. 73, #2, p. 755, January 1993.

"Admittance Spectroscopy of Boron Doped Diamond", J. Glesener, A.A. Morrish, and K.A. Snail, Appl. Phys. Lett., 62, 181, March 1993.

"Analysis of Ocean Horizon Image Measurements in the MWIR." E.H. Takken, J. T. Caulfield, E.J. Stone, E.P. Shettle, R.G. Priest, M.D. Mermelstein, and R. York, Proceedings, IRIS Group Meeting on Targets, Backgrounds, and Sensors, January 1993.\*

"Optimized IR FPA Designs for Detection of Sea Skimming Missiles." J.P. Karins and E.J. Stone, Proceedings, IRIS Group Meeting on Passive Sensors, March 1993.\*

"High-Speed Opto-Electronic System for Matched Filter Signal Processing." R.D. Griffin, J. T. Stringer, R.B. Brown, and J.N. Lee, presented and published in the Proceedings of the Parallel Systems Fair of the 6th International Parallel Processing Symposium (IEEE Computer Society), Beverly Hills, CA, pp. 38-43, 24 March 1993.\*

"Interfer. Measurement Of Lateral Phase Profile & Thermal Lensing Photonics Tech.In Broad Area Diode Amplifiers." D.Hall, L. Goldberg, D.Mehuys Ltrs., V.5 (resubmitted to PTL 3/93) Pub. August 1993.

"11.6 W Peak Power Diffract. Limited Diode To Diode Amp." D.Mehuys, L.Goldberg, Applied Physics Ltrs.JFW 7/8/92, Publ. V.62, #1993.

"Effects Of Parasitic Fabry-Perot Cavities In Fiber Optic Interfer. Sensors." Dagenais, Koo, Bucholtz, Optics Letters, Publ. V.18, #5, March 1993.

"Reflective Fiber Ring Resonator W/Polariz. Independent Operation." M.Davis, Wanser, Kersey Optics Letters, Publ. V.18, #9, May 1993.

"3.0 W Blue Light Generation By Freq. Doubl. Of Broad Area Semiconductor Amplifier Emission " Busse, Goldberg, Electronics Letters, Publ. V.29, January 1993.

"Multiplexed Bragg Grating Fiber Laser Strain Sensor System W/Mode Locked Interrogation." A.Kersey, W.W.Morey, Electronics Letters, Publ. V.29, #1, p.112-114, Jan.1993.

"Observation Of Stochastic Resonance In A Tristable System." S.T.Vohra, F. Bucholtz Physical Review Letters, V.70, #1, P.413, January.1993.

"Role Of Dispersion In Limiting Pulse Width in Fiber Lasers." M. Dennis, I. Duling, Applied Physics Letters, V.62, #23, p.2911, June 1993.

- "4.5 Cw Near Diffraction Limited Tapered Stripe Semiconductor Optical Amplifier."  
D.Mehuys, L. Goldberg, R. Waarts, Electronics Letters, Publ. V.29, #2, p.219, January 1993.
- "Intracavity Dispersion Measurement In A Mode Locked Fiber Laser." M.L.Dennis, I.N.Duling  
Electronics Letters, V.29, #4, p. 409, February 1993.
- "High Power Near Diffraction Limited Large Area Traveling Wave Semiconductor Amplifiers."  
L.Goldberg, D.C.Hall, D.Mehuys, M.Surette, J.Quantum Elect., V.29, #6, June 1993.
- "Filament Formation In A Tapered Gallium Tapered Amplifier." L.Goldberg, M.Surette, D.Mehuys  
Applied Physics Letters, V.62, (19), p.2304, May 1993.
- "Dynamical Characterization Of A Subcritical Bifurcation W/Inversion Symmetry." S.Vohra,  
F.Bucholtz, Phy. Review Ltrs/. V.70, #10, p. 1425, March 1993.
- "Fiber Soliton Lasers Produce Ultrashort Pulses." I.Duling, III Laser Focus World, p. 213, April  
1993.
- "Determination Of Iron, Cobalt, Nickel, And Copper In Hafnium Fluoride By Gf-Aas." J.  
Jaganathan, I. Aggarwal, Applied Spectroscopy, Vol 47, No. 2, pp. 190-191, March 1993.
- "An Efficient 1.46 $\mu$ m Thulium Fiber Laser Via A Cascade Process." R. Allen, L. Esterowitz, I.  
Aggarwal, published in Quantum Electronics Letters., Vol. 29, No. 2, February 1993.
- "Detection Of Trace Levels Of Mercury In Aqueous Systems Via A Fiber Optic Probe",  
K. Ewing, G. Nau, J. Jaganathan, T. Bilodeau, I. Schneider, I. Aggarwal, for publication in the  
SPIVE Proceedings, Vol. 2069, March 1993.\*
- "Fiber-Optic Raman Probe Detection Of Chlorinated Hydrocarbons In Standard Soils." T.  
Bilodeau (Post Doc), K. Ewing, I. Kraucunas, J. Jaganathan, G. Nau, I. Aggarwal, for  
publication in the SPIVE Proceedings, Vol. 2069, January 1993.\*
- "Determination of Iron, Cobalt, Nickel, and Copper in Hafnium Fluoride by GF-AAS." J.  
Jaganathan, I. Aggarwal, published in Applied Spectroscopy, Vol. 47, Number 2, pp. 190-191,  
March 1993.
- "Comment On (Radiation Exposure Challenges Optical-Fiber Performance)." by Prof. Alvin  
Kanofsky, E. Friebele, Laser Focus World, pp. 145-152, for publication in Laser Focus World,  
March 1993.
- "An Efficient 1.46 $\mu$ m Thulium Fiber Laser via a Cascade Process." R. Allen, L. Esterowitz, I.  
Aggarwal, published in Quantum Electronics Letters, Vol. 29, No. 2, February 1993.
- "Nonresonant Optical Nonlinearity of Quantum Confined Nanocrystals of CuBr in Glass." B. L.  
Justus, J. A. Ruller, Opt. Mat'ls. 2, p. 33, March 1993.
- "Optical Vortex Solitons And The Stability Of Dark Soliton Stripes." C. T. Law and G. A.  
Swartzlander, Jr., Opt. Letts., 18, 586, January, 1993.
- "The Nuclear Quadrupole Interaction in High Temperature Superconductors." N. Winter, C.  
Merzbacher, C. Violet, Applied Spectroscopy Reviews, 28, 123-164, March 1993.

"Comment On "Radiation Exposure Challenges Optical-Fiber Performance." E. Friebele, by Prof. Alvin Kanofsky, Laser Focus World, pp. 145-152, March 1993.

"Magneto-Optic and Magneto-Transport Study of InAs/Ga<sub>1-x</sub>InSb Superlattices", J. P. Omaggio, R. J. Wagner, J. R. Meyer, C. A. Hoffman and J. J. Yang et al, Semiconductor Science and Technology, 8, S112, March 1993.

Novel Magneto-Transport and Magneto-Optical Processes in Semimetallic HgTe-CdTe Superlattices, C. A. Hoffman, J. R. Meyer and F. J. Bartoli, Semiconductor Science and Technology, 8, S48, March 1993.

"Sb/GaSb Multilayer Structures for Potential Applications as an Indirect Narrow Bandgap Material." T.D. Golding, J.A. Dura, W.C. Wang, J. T. Zborowski, H.C. Chen, A. Vigliante, J. H. Miller, and J. R. Meyer, Semiconductor Science and Technology, 8, S117, February 1993.

"Reactions of Atomic and Diatomic Iron with Allene in Solid Argon", D. W. Ball, Cleveland State Univ., R.G.S. Pong and Z. H. Kafafi, J. Am. Chem. Soc. 115, 2864, April 1993.

"Molecular Beam Epitaxial Growth of Sb/GaSb Multilayer Structures: Potential Application as a Narrow Bandgap System", T. D. Golding, J. A. Dura, H. Wang, J. T. Zborowski, A. Vigliante, H. C. Chen and J. R. Meyer, Jour. Crystal Growth, 127, 777, March 1993.

"Nanometer Fabrication in Mercury Cadmium Telluride by Electron Cyclotron Resonance Microwave Plasma Reactive Ion Etching", C. R. Eddy, Jr, C. A. Hoffman, J. R. Meyer and E.A. Dobisz (6864), Appl. Phys. Lett. 62, 2362, June 1993.

"Fullerenes and Photonics", Z. H. Kafafi, Photonics Spectra Jour., Lauren Publishing Co., p. 76, 1993.

"Broadband Thermal Optical Limiter", B. L. Justus, A. L. Huston and A. J. Campillo, Appl. Phys. Lett., 63 1483-1485, January 1993.

"Organometallic Chemical Vapor Deposition and Characterization of Indium Phosphide Nanocrystals in Vycor Porous Glass", D. G. Hendershot, D. K. Gaskill, B. L. Justus, M. Fatemi and A. D. Berry, Appl. Phys. Lett., 63 3324-3326, July 1993.

"Optical Limiting in Semiconductor Nanocrystals in Glass", B. L. Justus, A. J. Campillo, D. G. Hendershot and D. K. Gaskill Opt. Comms. 103, 405-409, March 1993.

"High Precision Identification Of Morphology Dependent Resonances In Optical Processes In Microdroplets", J. D. Eversole, H-B Lin, A. L. Huston, A. J. Campillo, P. T. Leung, S.Y. Liu and K. Young, J. Opt. Soc. Am. B., 10, 1955-1968, April 1993.

"Cavity Quantum Electro-Dynamic Enhancement Of Nonlinear Optical Susceptibility In Microdroplets", H-B. Lin and A. J. Campillo, submitted to Phys. Rev. Lett., 2 June 1993.

"Micropatterned Diamond Substrates", J. Glesener and R. J. Tonucci, J. Appl. Phys., 74, 5280-5281, February 1993.



- "Dynamics of the 5 eV Optical Absorption in SiO<sub>2</sub> Glass", T. Tsai, J. Jewell, J. Sanghera, Appl. Phys. Lett. **62** (26) 3396-3398, September 1993.
- "X-Ray Absorption Studies of Ge and Ga Environments in BaO-Ga<sub>2</sub>O<sub>3</sub>-GeO<sub>2</sub> Glasses", C. Merzbacher, D. McKeown, Journal of Non-Crystalline Solids Vol. **162**. p. 81-100, April 1993.
- "Radiation-Induced Defects in Glasses: Origin of Power-Law Dependence of Concentration on Dose." D. L. Griscom, M. E. Gingerich and E. J. Friebele, Phys. Rev. Lett. **71** (7) 1019-1022, March 1993.
- "Thermal Stability of Photo-Induced Gratings and Ge E'-type Centers in Ge-and Ge-P-doped Silica Optical Fibers", T. Tsai, E. Friebele and D. L. Griscom, Optics Letters **18** (12) 935-937, March 1993.
- "Type-II Superlattices and Variable Overlap Superlattices as Nonlinear Optical Materials for the Longwave Infrared", E. R. Youngdale, J. R. Meyer, C. A. Hoffman, F. J. Bartoli, and W. I. Wang, Int'l. Jour. Nonlinear Opt. Phys. **2**, 415, March 1993.
- "Shubnikov-de Haas Oscillations and Quantum Hall Features in InAs Ga<sub>1-x</sub>In<sub>x</sub>Sb Superlattices", C. A. Hoffman, J. R. Meyer and F. J. Bartoli and W. I. Wang, Phys. Rev. B, **48**, 1959, October 1993.
- "Semimetal-to-Semiconductor Transition in Bismuth Thin Films", C. A. Hoffman, J. R. Meyer and F. J. Bartoli et al., Phys. Rev. B. **48**. 11431, April 1993.
- "Excited-State Absorption-Enhanced Thermal Optical Limiting with C<sub>60</sub>", B. L. Justus, Z. H. Kafafi and A. L. Huston, Optics Letters, **18**, No. 19, 1603-1605, March 1993.
- "An Optical Limiter Using PbPc (CP)<sub>4</sub>", J. S. Shirk, R.G.S. Pong, F. J. Bartoli and A. W. Snow, submitted Appl. Phys. Lett., April 1993.
- "Magneto Optical Determination of T-Point Energy Gap in Bismuth", J. P. Omaggio, J. R. Meyer, C. A. Hoffman et al, Phys. Rev. B. **48**, 11439, February 1993.
- "Nonlinear Optical Properties of the Fullerenes C<sub>60</sub> and C<sub>70</sub> at 1.064μm", J. R. Lindle, R.G.S. Pong, F. J. Bartoli and Z. H. Kafafi, Phys. Rev. B. **48**, No. 13, 9447, January 1993.
- "Strain Sensitive Elastic Scattering From Cylinders", A. L. Huston and J. D. Eversole, Optics Letts., **18**, 1104-1106, April 1993.
- "Characteristics of a Low F-number Thermal Broadband Optical Limiter", G. A. Swartzlander, Jr., A. L. Huston, B. L. Justus, A. J. Campillo and C. T. Law, Int. J. Nonlin. Opt. Phys., **2**, 577-611, April 1993.
- "In-Line Fiber Etalon for Strain Measurement", J. Sirkis, M. Putnam, T. A. Berkoff, A.D. Kersey, D. D. Brennan, and J. Friebele, Optics Letters, **18**, 1973-1975, March 1993.
- "Interface Roughness Scattering in Semiconducting and Semimetallic InAs-Ga<sub>1-x</sub>In<sub>x</sub>Sb Superlattices", C. A. Hoffman, J. R. Meyer, E. R. Youngdale and F. J. Bartoli, Appl. Phys. Lett. **63**, 2210, February 1993.

"Single Pulse Formation of Fiber Bragg Gratings", Charles G. Askins, Tsung-Ein Tsai, Glen Williams, Martin A. Putnam and E. Joseph Friebele, Optics and Photonics News, 4, 29, January 1993.

"Broadband Thermal Optical Limiter", B. L. Justus, A. L. Huston and A. J. Campillo, Opt. & Phot. News 4, 42, September 1993.

"Defect Centers in Heavy Metal Fluoride Glasses: A Review", D. Griscom, J. Non-Cryst. Solids 161, 45-51, March 1993.

"Electrical Conductivity Of Ladder-Type Polymeric Transition-Metal Complexes Derived From 2,5-Diamino-1,4 Benzenedithiol", O.-K. Kim, T. E. Tsai, T. H. Yoon and L. S. Choi, Synthetic Metals, 59, 59-70, January 1993.

"Thermal Stability Of Self-Organized Gratings And Defects In Ge- And Ge-P-Doped Silica Core Fibers", T. E. Tsai, E. J. Friebele and D. L. Griscom, SPIE, 2044, 121-132, February 1993.

"Performance and Laser Hardening Effectiveness of a Reduced Bandwidth FLIR (U)", C. A. Hoffman, F. J. Bartoli, et al, IRIS Symposium on Infrared Countermeasures, APL/JHU, Laurel, MD, and publication in Proceedings, April 1993.\*

"Susceptibility of LWIR PV HgCdTe Focal Plane Arrays to CO<sub>2</sub> Laser Irradiation (U)", C. A. Hoffman, F. J. Bartoli, J. R. Lindle and E. R. Youngdale, 31st IRIS Symposium on Infrared Countermeasures, APL/JHU, Laurel, MD, and publication in Proceedings, March 1993.\*

"Susceptibility of HgCdTe Vertically Integrated Photodiode IRFPAs to CO<sub>2</sub> Laser Irradiation (U)", C. A. Hoffman, F. J. Bartoli, J. R. Lindle and E. R. Youngdale, 1993 IRIS Specialty Group Meeting on Infrared Detectors, Boston, MA, and publication in Proceedings, April 1993.\*

"Type-II Variable Overlap and Indirect Narrow-Gap Superlattices for LWIR Nonlinear Optical Applications", J. R. Meyer, E. R. Youngdale, C. A. Hoffman and F. J. Bartoli, (INVITED PAPER) 1993 LEOS Annual Meeting, San Jose, CA, and publication in Proceedings, November 1993.\*

"MBE Growth of Bi Epilayers and Bi-CdTe Superlattices", A. Divenere, X. J. Yi, C. L. Hou, H.C. Wang, J.B. Ketterson and G. K. Wong (Northwestern Univ.), C. A. Hoffman, J. R. Meyer and F. J. Bartoli, North American Conference on Molecular Beam Epitaxy, Stanford University, Stanford, CA, and publication Solid State Electronics Journal, September 1993.

"Considerations For Producing Single-Pulse Fiber Bragg Gratings", C. G. Askins, E. J. Friebele, M. A. Putnam, G. M. Williams, SPIE Proceedings, Vol. 2071, March 1993.\*

"Photosensitivity of Rare-Earth-Doped Glasses", G. W. Williams, D. A. Dutt, J. A. Ruller, D. L. Griscom, J. M. Jewell, K. K. Krahan and E. J. Friebele, SPIE Proceedings, Optics Quebec, April 1993.\*

"X-ray Absorption Analysis of Ge and Ga Environments in Ba-Gallogermanate Glasses", C. L. Merzbacher and D. A. McKeown, Materials Research Society Proceedings Vol 307, 69-74, September 1993.\*

"Long-Wavelength Infrared Transmitting Glasses: Newternary Sulfide Compositions", C. L. Merzbacher, B. B. Harbison, E. A. Bolden and I. D. Aggarwal, SPIE Proceedings, Vol. 2018, Passive Materials for Optical Elements II, 58-65, April 1993.\*

"Theory and Design of Local Interpolators", A. Schaum, CVGIP:Graphical Models and Image Processing, Vol. 55, No. 6, November, pp. 464-481, September 1993.

"Admittance Spectroscopy of Boron Doped Diamond." J. Glesener, K. A. Snail, and A. A. Morrish, Appl. Phys. Lett., 62, 181, February 1993.

"Studies of Turbulent Oxycetylene Flames used for Diamond Growth." C.M. Marks, H.A. Burris, J. Grun, and K. Snail, published in Journal of Applied Physics, vol. 73 #2, p. 755, January 1993.

"Photoluminescence Investigation Of A-C:H Thin Films", J. W. Glesener, J. M. Anthony, and A. Cunningham, Diamond and Related Materials, V. 2, p. 670, March 1993.

"Photoinduced Current Transient Spectroscopy Of Boron Doped Diamond", J. W. Glesener, Appl. Phys. Lett., Vol. 63, p. 767, December 1993.

"Micro Pattern Transfer Using Diamond", J. Glesener and R.J. Tonucci, submitted to J. Appl. Phys. v. 74, p. 5280, July 1993.

"Effects of Non-Redundance on a Synthetic Aperture Imaging System", L.Sica, J.Opt.Soc.Am.A, 567-572, December 1993.

"Adaptive Nonuniformity Correction for Staring IRFPA Cameras", D.A.Scribner, J.T.Caulfield, K.A. Sarkady, M.R.Kruer, C.Terrill, and K.Dang, Presented at the 1993 IRIS Detector Specialty Meeting, Boston, and for Publication in the Proceedings, August 1993.\*

"Composite Infrared Color Images and Related Processing", D.A.Scribner, M.P.Satyshur and M.R.Kruer, IRIS targets, Background and Discrimination Meeting, San Antonio, TX, and publication in Proceedings, January 1993.\*

"Effects Of System Stability And Detector 1/F Noise On Staring Irfpa Performance", K.A.Sarkady, J.T.Caulfield, M.R.Kruer and D.A. Scribner, IRIS Passive Sensor Specialty Group Meeting, APL/JHU, Laurel, MD and publication in Proceedings, March 1993.\*

"Adaptive Retina-like Preprocessing for Imaging Detector Arrays", D.A.Scribner, K.A.Sarkady, M.R.Kruer, J.T.Caulfield, J.D.Hunt, M.Colbert and M.Descour, for presentation IEEE International Conference on Neural Networks, San Francisco, CA, March, and publication in Proceedings, April 1993.\*

"Performance of Real-Time Adaptive Non-Uniformity Correction Techniques for IRFPA's", J.T.Caulfield, D.A.Scribner, K.A. Sarkady and M.R. Kruer, IRIS Passive Sensor Specialty Group Meeting, APL/JHU, Laurel MD, and publication in Proceedings, March 1993. \*

"Detection of Theater Ballistic Missiles using Staring Infrared Arrays (U)", M.R.Pauli, IRIS Passive Sensor Specialty Group Meeting, APL/JHU, Laurel, MD, and publication in Proceedings, March 1993.\*

"Effects of Low Power IR Laser Countermeasures on Several Infrared Focal Plane Arrays", J.T.Caulfield, M.R.Kruer and K.A. Sarkady, for presentation 31st IRIS Symposium on Infrared Countermeasures, APL/JHU, Laurel, MD, and publication in Proceedings, April 1993.\*

"Time Gated Imaging Using Nonlinear Optical Techniques Applications to Turbid Materials", J. Reintjes, M. Duncan, R. Mahon, L Tankersley, M. Bashkansky and J. Prewitt, published in

conference proceedings of the OE/LASE 93 Conference in Los Angeles, CA, (5640-6027/93), January 18, 1993.\*

"Coherent Gates for Two-Dimensional Medical Imaging Using Stimulated Raman Scattering", M. Bashkansky, C. Adler, R. Mahon, J. Prewitt and J. Reintjes, published in conference proceedings at CLEO, March 1993.\*

"Stimulated Brillouin Scattering And Phase Conjugation Of A 2.1 $\mu$ M Cr:Tm:Ho:Yag Laser", W. Whitney and A. Scott, published in conference proceedings of Advanced Solid State Lasers, New Orleans, LA, February 1-3, 1993.\*

"High Power Holmium Laser for Parametric Frequency Conversion", S. Bowman, J.G.Lynn, S. Searles, B. Feldman, J. McMahon, W. Whitney, C. Marquardt, D. Epp, G. Quarles, and K. Riley submitted for conference proceedings of the 92 International Lasers Conference, March 1993.\*

"High Power Diode Pumped Two Micron Lasers", S. Bowman, J.G. Lynn, S. Searles, B. Feldman, J. McMahon, W. Whitney, C. Marquardt, and D. Epp, submitted for conference proceedings of the SPIE Conf. 1993.\*

"A Comparative Study Of Diode Pumped Two Micron Laser Materials", S. Bowman, J. Lynn, S. Searles, B. Feldman, J. McMahon, W. Whitney, C. Marquardt and D. Epp, submitted to the conference proceedings of the OSA 1993 Advanced Solid State Lasers, 1993.\*

"Mid-IR Spectroscopic Analysis of Pr<sup>3+</sup>: LaCl<sub>3</sub>", S. Bowman, J. Ganem and B. Feldman, submitted to the 1993, Technical digest of The CLEO 1993 Conference.\*

"Optical Limiting with Semiconductor Quantum Dots", B. Justus, D. Hendershot, D. Gaskill, and A. Berry, submitted for conference proceedings at QELS 1993.\*

"New Nonlinear-Optical Technique for 2-D Gated Medical Imaging with Long Laser Pulses", M. Bashkansky, C. Adler, and J. Reintjes, submitted for conference proceedings of the OSA Annual Meeting in Toronto Ontario, Canada, October 3-8, 1993.\*

"Continuously Tunable 2.3 $\mu$ m Tm:GSGG Laser", G. Rosenblatt, J. Pinto, R. Stoneman and L. Esterowitz, submitted for conference proceedings of LEOS 93, San Jose, CA, November 15-19, 1993.\*

"Power Scaling of Diode-Pumped 2 Micron Lasers", S. Bowman, J.G. Lynn, S. Searles, B. Feldman, J. McMahon, W. Whitney, C. Marquardt, D. Epp and G. Quarles, submitted to LEOS 93 conference proceedings, San Jose, CA, Nov. 15-19, 1993.\*

"Diode Pumped Solid State Mid-IR Lasers for Medical Applications", L. Esterowitz, R. Stoneman, J. Pinto and G. Rosenblatt, submitted for conference proceedings, San Jose, CA, Nov. 15-19, 1993.\*

"Thermal Effects In Zinc Germanium Phosphide Optical Parametric Oscillators", C. Marquardt, W. Whitney and B. Feldman, submitted for Technical Digest of the CLEO 93 conference, Anaheim, CA, May 8-12, 1993.\*

"An Efficient 1.46 $\mu$ m Thulium Fiber Laser Via a Cascade Process", R. Allen, L. Esterowitz and I. Aggarwal, Jour. Quantum Elecs. Vol. 29, No. 2, February 1993.

"The Dynamics of the Nonlinear Optical Response in Phthalocyanines", J. S. Shirk, J. R. Lindle, S. R. Flom, F. J. Bartoli, M. E. Boyle and A. W. Snow, for presentation O/E LASE '93, Los Angeles, CA, and publication in Technical Digest/Proceedings, January 1993.\*

"Review of IRFPA Susceptibility to Laser Countermeasures (U)", C. A. Hoffman, F. J. Bartoli, J. R. Lindle and E. R. Youngdale, IRIS Passive Sensor Specialty Group Meeting, APL/JHU, Laurel, MD, and publication in Proceedings, March 1993.\*

"Adaptive Retina-like Preprocessing for Imaging Detector Arrays", D. A. Scribner, K. A. Sarkady, M. R. Kruer, J. T. Caulfield, J. D. Hunt, M. Colbert and M. Descour, for presentation IEEE International Conference on Neural Networks, San Francisco, CA, and publication in Proceedings, March 1993.\*

"Performance of Real-Time Adaptive Non-Uniformity Correction Techniques for IRFPAs", J. T. Caulfield, D. A. Scribner, K. A. Sarkady and M. R. Kruer, IRIS Passive Sensor Specialty Group Meeting, APL/JHU, Laurel, MD, and publication in Proceeding, March 1993.\*

"Detection of Theater Ballistic Missiles using Staring Infrared Arrays (U)", M. R. Pauli, IRIS Passive Sensor Specialty Group Meeting, APL/JHU, Laurel, MD, and publication in Proceedings, March 1993.\*

"Nonlinear Optical Properties of the Fullerenes in the Near-Infrared and Visible", J. R. Lindle, S. R. Flom, R.G.S. Pong, F. J. Bartoli, and Z. H. Kafafi, for presentation Materials Research Spring Meeting, San Francisco, CA, and publication in Proceedings, April 1993.\*

"Nonlinear Optical Response of the Fullerenes in the Near-Infrared and Visible", J. R. Lindle, S. R. Flom, R.G.S. Pong, F. J. Bartoli and Z. H. Kafafi, for presentation CLEO/QELS 93' Conference, Baltimore, MD, and publication in Proceedings, May 1993.\*

"Recombination Lifetime in InAs-GaSb and InAs-Ga<sub>1-x</sub>In<sub>x</sub>Sb LWIR Detector and Nonlinear Optical Materials", E.R. Youngdale, M. J. Frankel, J. R. Meyer, C. A. Hoffman, F. J. Bartoli and W. I. Wang, for presentation CLEO/QELS 93' Conference, Baltimore, MD, and publication in Proceedings, May 1993.\*

"Continuously Tunable 2.3 $\mu$ m Tm<sup>3+</sup>:YLF Laser", J. F. Pinto, R. C. Stoneman, L. Esterowitz and G. H. Rosenblatt (SFA Inc.), for presentation CLEO/QELS 93' Conference, Baltimore, MD, and publication in Proceedings, May 1993.\*

"Investigation of V/III-V Heteroepitaxial Systems: Sb/GaSb - A Prototype of Mixed Total Valence Heteroepitaxy", C. A. Hoffman, J. R. Meyer, J. A. Dura (Univ of Houston) et al, for presentation 7th Euro-MBE Conference, Milan, Italy, May 1993.\*

"Crystal Growth and Spectroscopic Characterization of Tm-doped Oxyapatites and Orthosilicates", G. R. Rosenblatt, G. R. Quarles and L. Esterowitz, for publication Proceedings of the Advanced Solid State Laser Meeting, OSA., March 1993.\*

"Ultrafast Photodetection W/An Alinas/Gainas Heterojunction Bipolar Transistor.", T. Carruthers, M. Frankel, C. Kyono, Applied Physics Letters JFW 1/12/93, SER 5670-8041, publ. V.63, #14, October 1993.

"Testing Of A Planar Fiber Optic Hydrophone On Kamloops", A. Yurek, A. Tveten, A. Dandridge, US J. Underwater Acoustics JFW 1/27/93, Y. Chao, Published, V.43, #2, April 1993.

"Arctic Test Of A High Performance Fiber Optic Hydrophone Array", A. Yurek, Tveten, Chao, Dandridge, US J. Underwater Acoustics, Published, V.43, #2, April 1993.

"At Sea Noise Perf. Of Small Dia. & Extended F.O. Hydroph. For Towed Arrays", A. Yurek, A. Tveten, A. Dandridge, US J. Underw. Acoust., Published, V.43, #2, April 1993.

"High Resolution F.O. Low Freq. Voltage Sensor Based On The Electrostrict. Effect", L. Fabiny, S. Vohra, F. Bucholtz, Phot. Tech., Letters, Publ., V.5, #8, August 1993.

"Multiplexed fiber bragg grating strain sensor syst. w/a fiber wavelength filter," Fabry-Perot Optics Letters, A. Kersey, T. Berkoff, W.W. Mlore, V.18, #16, p.1370, August 1993.

"High Power Ring Laser Using A Broad Area GaAlAs Amplifier", M. Surette, L. Goldberg, D. Mehuys, Photonics Technology Letters, V.5, #8, p.919, August 1993.

"Fiber Bragg Grating Based Er-Fiber Laser Strain Sensor System", A.D. Kersey, W.W. Mlore, Electronics Letters, V.29, May 1993.

"Interferometric Fiber Optic Acoustic Sensing", A. Dandridge, US Journal of Underwater Acoust., V.43, #2, April 1993.

"Microwave Optical Mixing In Linbo3 Modulators", G. Gopalakrishnan, W. Burns, IEEE Trans. on Microwave Theory & Tech., C. Bulmer, Publ. V.41, Dec. 93.

"Interfer. Measurement Of Lateral Phase Profile P.T.L.", Hall, Goldberg, Mehuys, Publ. V.5, #8, Ser 5670, Aug. 93.

"F.O. Current Sensor Using An Orthconjugating Loop Mirror", M. Marrone, Esman, Kersey, Optics letters JFW 4/7/93, SER 5670-8061 Publ. V.18, #18, Sept 93.

"F.O. Magnetometer System For Undersea Applications", Bucholtz, et. al. Electronics Letters, PUBL, V.29, #11, p.1032, May 1993.

"5.25 Cw Near Diffract. Limited Tapered Stripe Semiconduct. Photonics Technology Letters Optical Amplifier", Mehuys, Goldberg, Welch Publ. V.5, #10, p.1180, Oct. 93.

"F.O. Prism True Time Delay Antenna Feed", Esman, Frankel, Dexter, Goldberg IEEE Photonics Tech. Letters, Pub. V.5, #11, p.1347, Nov. 93.

"High Power Continuous Wave Blue Light Generation In K<sub>2</sub>Li<sub>2</sub>Si<sub>2</sub>O<sub>7</sub> Using Semiconductor Amplifier Seeded By A Laser Diode", L. Goldberg, L. Busse, D. Mehuys, Applied Physics Ltrs. Publ. V.63, #17, p.2327, Oct. 93.

"Difference-Freq. Mixing In AgGaS<sub>2</sub> By Using A High Power GaAlAs Tapered Semiconductor Amplifier At 860 Nm", U. Simon, F. Tittel, L. Goldberg, Optics Letters, Publ. V.18, #22, p.1931, Nov. 93.

"In line fiber etalon for strain measurement Optics", Sirkis, Brennan, Putman, Berkoff, Letters Kersey, Friebele Publ. V.18, #22, p.1973, Nov. 93.

"Interrogation & Multiplexing Techniques For Fiber Bragg Grating Strain Sensors", SPIE, V.2071, A. Kersey Multiplex. & Distrib. F.O. Sensors, 1993.

"Interferometric Fiber Optic Sensing", A.Dandridge, J. Underwater Acoustics, 5603 Publ. V.43, #2. April 1993.

"All Optical Towed Array Sea Test Results", B.Blakely, M. Berliner J.Underwater acoustics, P.Davis, A.Deus, R.Elswick, Publ. V.43, #2. April 1993.

"Development Of Fiber Optic Hydrophones For High Pressure Applications", A.Tveten, et. al. J. Underwater Acoustics 5603 Pub.. V.43, #2. Apr. 1993.

"Measurement Of Input Polarization Induced Phase Noise In The All Optical Towed Array", J. Underwater Acoustics, A.Kersey, A.Dandridge, Pub. V.43, #2, Apr. 1993.

"F.O. heading sensor for the AOTA", S.Patrick, F.Bucholtz, J.Underwater Acoustics 5603 Pub.V.43, #2, Apr. 1993.

"Hot Isostatic Pressing Fluoride Glasses", B. Harbison, I. Aggarwal, Journal of Non-Crystalline Solids, Vol. 161, pp 7-9 (1993).

"An Efficient 1.46  $\mu\text{m}$  Thulium Laser via a Cascade Process", R. Allen, L. Esterowitz, I. Aggarwal, published in Quantum Electronics Letter, Vol. 29, No. 2, pp. 303-306, February 1993.

"Determination of Iron, Cobalt, Nickel, and Copper in Hafnium Fluoride by GF-AAS", J. Jaganathan, I. Aggarwal, , published in Applied Spectroscopy, Vol. 47, Number 2, pp. 190-191 (1993).

"An Efficient 1.46 $\mu\text{m}$  Thulium Fiber Laser via a Cascade Process", R. Allen, L. Esterowitz, I. Aggarwal, published in Quantum Electronics Letters. Vol. 29, No. 2, February 1993.

"Measurement of Bulk Absorption Coefficients of Chalcogenide and Chalcohalide Glasses at 10.6  $\mu\text{m}$  using CO<sub>2</sub> Laser Calorimetry", J. Sanghera, V. Nguyen, R. Miklos, I. Aggarwal, for publication in the Proceedings of 8th International Halide Symposium, 1993.\*

"Long-wavelength infrared transmitting glasses: New ternary sulfide compositions", C. Merzbacher, B. Harbison, E. Bolden, I. Aggarwal, for publication in the Proceedings of Conference on Passive Materials for Optical Elements, II, 1993.\*

"Detection of Trace Levels of Mercury in Aqueous Systems via a Fiber Optic Probe", K. Ewing, G. Nau, J. Jaganathan, T. Bilodeau, I. Schneider, I. Aggarwal, for publication in the SPIE Proceedings, Vol. 2069, 1993.

"Fiber-optic Raman probe detection of chlorinated hydrocarbons in standard soils", T. Bilodeau, K. Ewing, I. Kraucunas, J. Jaganathan, G. Nau, I. Aggarwal, for publication in the SPIE Proceedings, Vol. 2069, 1993.\*

"Fiber Optic Flow Injection Sensor for Determination of Heavy Metals in Water", K. Ewing, G. Nau, J. Jaganathan T. Bilodeau, I. Schneider, I. Aggarwal, for publication in the Proceedings of International Symposium on Optical Sensing for Environmental Monitoring.\*

"X-Ray Absorption Studies of Ge and Ga Environments in BaO-Ga<sub>2</sub>O<sub>3</sub>-GeO<sub>2</sub> Glasses", C. Merzbacher, D. McKeown, Journal of Non-Crystalline Solids Vol. 162. p. 81-100 (1993).

"The Use of Optical Time Domain Reflectometers to Measure Radiation Induced Losses in Optical Fibers", E.J. Friebele et al, for publication Elec. Letts., 1993.

"Sixth International Conference on II-VI Compounds and Related Optoelectronic Materials", C. E. Eddy, Jr., J. R. Meyer, C. A. Hoffman and E. A. Dobisz, Newport, RI, and publication in Journal of Crystal Growth, North Holland-Amsterdam (Sep 93) .

"A Toolset for Navigation in Virtual Environments", Rudolph P. Darken and J. L. Sibert, Proceedings of the ACM Symposium on User Interface Software and Technology, pp. 157 - 165, November, 1993.\*

"A Study of Navigation in Virtual Space", Rudolph P. Darken, J. L. Sibert and R. Shumaker , Proceedings of the Seventh Annual Workshop on Space Operations Applications and Research, pp. 51 - 60, August, 1993.\*

"Analysis of the Four Basic Resonant Mode Types of an Enclosed Rectangular Microstrip Patch Including the Effects of Coupling Between Patches", P.W.Grounds, K.A.Zaki, IEEE Trans. on Magnetics, Vol. 29, pp. 1656-1659, March 1993.

"Analysis of the Coupling Between Degenerate Modes of Enclosed Rectangular Microstrip Patches", P.W.Grounds, K.A.Zaki., 1993 IEEE Antennas and Propagation Society International Symposium Digest, Symposium Digest, June 1993.\*

"Neural Network: what they are and what they can do", M. W. Kim, KSEA Letters, August, 1993.\*

"Efficient Organization of Large Ship Databases Using Wavelets and Structured Quantization", J. Baras and S.Wolk, Proceedings of the 1993 Asilomar Conference, (Invited Paper), Nov 93.\*

"Use of Calculated Quantum Chemical Properties as Analogs for Solvatochromic Parameters in Structure-Activity Relationships", Cramer, C. J., Famini, G. R. and Lowrey, A. H., Accounts of Chemical Research, 26 , pp. 599-605 (1993).

"Scaled Quantum Mechanical Force Field for Glycine in Basic Solution", Lowrey, A. H., Kalasinsky, V., and Williams, R. W., Structural Chemistry 4 , pp. 289-298 (1993).

"Scaled Quantum Mechanical Force Field for Cis- and Trans-glycine in Acidic Solution", Lowrey, A. H., Kalasinsky, V. and Williams, R. W., J. of Mol. Structure 281, pp. 157-171 (1993).

"Aza-analogues of Cage Compounds: Potential Precursors to Azaacubanes and 1-Azahomocubanes", Gilardi, R., George, C., Karle, J., Eaton, P. E. and Fisher, A. M., J. Heterocyclic Chem., pp. 1385-1388, Oct.-Nov. (1993).

"Azidocarbonyl-substituted Cubanoureas", Gilardi, R., George, C. Karle, J., Eaton, P. E. and Rao, M., J. Heterocyclic Chem., pp. 1389-1391 Oct.-Nov. (1993).

"A Partial Primary Structure of Squid Hepatopancreas Organophosphorus Acid Anhydrolase", Kopec-Smyth, K., Deschamps, J. R., Loomis, L. D. and Ward, K. B., J. of Biochem. Interactions 87, pp. 49-54 (1993).

"Preparation and Initial Characterization of Crystals of the Photoprotein Aequorin From *Aequorea victoria*", Hannick, L. I., Prasher, D. C., Schultz, L. W., Deschamps, J. R., and Ward, K. B., Proteins: Structure, Function and Genetics 15, pp. 103-107 (1993).



"Comparison of Organophosphorous Acid Anhydrolases from Different Species Using Monoclonal Antibiotics. Deschamps", J. R., Kopec-Smyth, K., Poppino, J. L., Futrovsky, S. L. and Ward, K. B., Comparative Biochem. & Physiology 106C, pp. 765-768 (1993).

"Crown Ether Ionophores. Construction of Neutral Carrier Ion-Selective Electrodes", Moriarty, R. M., Chander Rao, M. S., Tuladhar, S. M., D'Silva, C., Williams, G. and Gilardi, R., JACS 115, pp. 1194-1196 (1993).

"Polynitronorbornanes, Bicyclooctanes, and Cyclohexanes", Olah, G. A., Ramaiah, P., Prakash, G. K. S. and Gilardi, R., J. Org. Chem. 58, pp. 763-765 (1993).

"The Molecular and Crystal Structures of Polycyclic Energetic Materials", Gilardi, R. Materials Research Soc. Symp. Proc. 296, pp. 233-236 (1993).

"NTO Polymorphs", Lee, K-Y, and Gilardi, R., Materials Research Soc. Symp. Proc. 296, pp. 237-242 (1993).

"An Unusual Bi-Tri-Binuclear Sandwich Complex formed in the Reaction of CuCl<sub>2</sub> with the ET<sub>2</sub>N-N<sub>2</sub>O<sub>2</sub>- Ion.", Christodoulou, D., George, C., and Keefer, L. K., J. Chem. Soc., Chem Commun, pp. 937-939 (1993).

"Thiaphysovenol Phenylcarbamates: X-Ray Structures of Biologically Active and Inactive Anticholinesterase Agents", Flippen-Anderson, J. L., He, X., Brossi, A., Greig, N. H. and Rapoport, S. I., Heterocycles 36, pp. 79-85 (1993).

"Accommodation of D-Phe Residue into a Right-Handed 310-Helix: Structure of Boc-D-Phe-(Aib)<sub>4</sub>-Gly-l-Leu-(Aib)<sub>2</sub>-OMe, an Analogue of the Amino Terminal Segment of Antiamoebins and Emerimicins" Karle, I. L., Flippen-Anderson, J. L., Uma, K., Balaram, P., Biopolymers 33, pp. 401-407 (1993).

"Unfolding of an  $\alpha$ -Helix in Peptide Crystals by Solvation: Conformational Fragility in a Heptapeptide" Karle, I. L., Flippen-Anderson, J. L., Uma, K., Balaram, P., Biopolymers 33, pp. 827-837 (1993).

"Structures of Riboflavin Tetraacetate and Tetrabutryrate: Molecular Packing Mode of Riboflavin Tetracarboxylate and its Extensive Stacking and Hydrogen-Bonding Characteristics", Ebitani, M., In, Y., Ishida, T., Sakaguchi, K., Flippen-Anderson, J. L. and Karle, I. L., Acta Cryst B49, pp. 136-144 (1993).

"Synthesis and Binding Properties of MK-801-Isothiocyanates: (+)-3-Isothiocyanato-5-methyl-10,11-dihydro-5H-dibenzof[a,d]cyclohepten-5,10-imine hydrochloride: A New, Potent and Selective Electrophilic Affinity Ligand for the NMDA Receptor-Coupled Phencyclidine Binding Site", Linders, J. T. M, Monn, J. A., Mattson, M. V., George, C., Jacobson, A. E. and Rice, K., J. Med. Chem. 36, pp. 2499-2507 (1993).

"Ion channel formation by zervamicin-IIB, a Molecular modelling study", Sansom, M. S.P., Balaram, P. and Karle, I. L., European Biophysics Journal, pp. 369-383 (1993).

"Peptide mimics for structural features in proteins: Crystal structures of three heptapeptide helices with a C-terminal 6-1 hydrogen bond" Karle, I. L., Flippen-Anderson, J. L., Uma, K., Balaram, P., Int. J. Peptide Protein Res. 42, pp. 401-410 (1993).

"A Broadband Nuclear Magnetic Resonance Spectrometer: Digital Phase Shifting and Flexible Pulse Programmer", X. Wu, D.A. Patterson, L. G. Butler, J.B. Miller, Rev. Sci. Instrum., 64, p. 1235 (1993).

"A Constraint Dynamics Approach to Rubber Elasticity", C.M. Roland and K.L. Ngai, Rub. Chem. Tech., 66, p. 817 (1993).

"A Morphological Investigation of Polyurethane/Diacetylene Segmented Copolymers", L.J. Buckley, P. Hammond and M. Rubner Macromolecules, 26, p. 2380 (1993).

"A Spectroscopic Investigation of the Nonrigid-Rigid Transition of (benzene)<sup>13</sup> During Free Jet Expansion", D.C. Easter, A.P. Baronavski and M. Hawley, J. Chem. Phys., 99, p. 4942 (1993).

"A Transmission Geometry Electrochemical Cell for the in-situ X-Ray Diffraction", K.M. Robinson and W.E. O'Grady, Rev. Sci. Instrum., 64, p. 1061 (1993).

"Accurate Determination of Auger Line Shape Binding Energies", N.H. Turner, D.E. Ramaker and F.L. Hutson, J. Electron. Spec. 63, p. 117 (1993).

"Adsorption of Spin Labeled Polymers on Carbon Fibers for Composite Interface Studies", A.W. Snow, Mat. Sci. and Eng., A162, p. 229 (1993).

"Aerosol Doping of Flame Grown Diamond Films", K. Doverspike, J.E. Butler and J.A. Freitas, Diamond and Related Materials, 2, p. 1078 (1993).

"Amorphous Fe-Ti-C Phase Produced by Ion Implantation of Iron and Its Role in Tribological Behavior", D.L. Williamson, I.L. Singer, R. Wei and P.J. Wilbur, Nuclear Instruments and Methods in Physics Research B76, p. 210 (1993).

"Analysis of Cross-Correlation, Phase Velocity Mismatch and Group Velocity Mismatches in Sum-Frequency Generation", A.P. Baronavski, H.D. Ladouceur and J.K. Shaw, IEEE J. of Quantum Electronics, 29, p. 580 (1993).

"Analysis of Phencyclidine and Cocaine in Human Hair by Tandem Mass Spectrometry", D.A. Kidwell, J. Forensic Sci., 38, p. 272 (1993).

"Analysis of Solvent Effects on the Decarboxylation of Benzisoxazole-3-carboxylate Ions Using Linear Solvation Energy Relationships: Relevance to Catalysis in an Antibody Binding Site", J.W. Grate, R.A. McGill and D. Hilvert, J. Am. Chem. Soc., 115, p. 8577, (1993).

"Analysis of Volatiles Evolved During High-Temperature Treatment of Thermally Stable Polymers. I. Nitrogen-Containing Acetylene-Terminated Resin", A. E. Mera and T. R. Walton, Journal of Applied Polymer Science., 47, p. 8676, (1993).

"Atomistic Simulations of Friction at Sliding Diamond Interfaces", J.A. Harrison, C.T. White, R.J. Colton and D.W. Brenner, MRS Bulletin, 18, p. 50, (1993).

"Bonding in Endohedral Metal-Fullerene Complexes: f-Orbital Covalency in Ce@C<sub>28</sub>", N. Rosch, O.D. Haberlen and B.I. Dunlap, Angew. Chem., 32, p. 108, (1993).

"Carbonization of High-Temperature Resins", S.B. Sastri, J.P. Armistead and T.M. Keller, Carbon, 31, p. 617 (1993).

- "CH+N<sub>2</sub>, HCN<sub>2</sub> - Kinetic Study of the Addition Channel From 300 - 1100K", L.J. Medhurst, N.L. Garland and H.H. Nelson, J. Phys. Chem., 97, p. 12275, (1993).
- "Chain Configuration of Polystyrene Arising From Freeze Drying Dilute Solutions", K.J. McGrath, C.M. Roland and R.G. Weiss, Macromolecules, 26, p. 6127, (1993)
- "Chemical Basis of Middle Distillate Fuel Instability: Interactive Effects of Selected Nitrogen Heterocycles with Organic Bases in a Shale-Derived Diesel Fuel", G.W. Mushrush, E.J. Beal and D.R. Hardy, Fuel Science and Technology Int'l, 11, p. 429, (1993).
- "Chemical Structure and Intermolecular Cooperativity: Dielectric Relaxation Results", C.M. Roland and K.L. Ngai, Macromolecules 26, p. 6824, (1993).
- "Chemistry and Localization Effects in the C-KVV Auger Lineshapes of Transition Metal Carbides and Related Compounds", P.E. Pehrsson and D.E. Ramaker, J. Mater. Res., 8, p. 2716, (1993).
- "CO Adsorption on Ion Bombarded Ni(111): Characterization by Photoemission from Adsorbed Xenon", S.S. Fu, G.P. Malafsky and D.S.Y. Hsu, Surf. Sci., 297, p. 167 (1993).
- "Collisions of C<sub>60</sub><sup>2+</sup> and C<sub>60</sub><sup>2+</sup> At Fluorinated and Non-Fluorinated Self-Assembled Monolayer Films", J.H. Callahan, A. Somogyi and V.H. Wysocki, Rapid Comm. in Mass Spectrom., 7, p. 693 (1993).
- "Comparison of Stability Results for Distillate Fuels Exposed to Different Stress Regimes", R.N. Hazlett, E.J. Beal, M.D. Klinkhammer and J.A. Schreifels, Energy & Fuels, 7, p. 127, (1993).
- "Conformal Chemical Beam Deposition of Thin Metal Film for Fabricating High Density Trench Capacitor Cells", D.S.Y. Hsu and H.F. Gray, Appl. Phys. Lett., 63, p. 159, (1993).
- "Coulometric Method for the Quantification of Low Level Concentrations of Hydrazine and Monomethylhydrazine", J.R. Wyatt, S.L. Rose-Pehrsson, K.P. Crossman, T.L. Cecil, N.K. Mehta and R. Young, Am. J. Ind. Hygiene, 54, p. 285, (1993).
- "Cyclocarbon Coalescence: Mechanisms for Tailormade Fullerene Formation", S.W. McElvany, M.M. Ross, N. Goroff and F. Diederich, Science, 259, p. 1594, (1993).
- "Data Acquisition and Control System for Molecule and Atom-Resolved Tunneling Spectroscopy", E.I. Altman, D.P. DiLella, J. Ibe, K. Lee and R.J. Colton, Rev. Sci. Instrum., 64, p. 1239, (1993).
- "Determination of the Orientation of C<sub>60</sub> Adsorbed on Au(111) and Ag(111)", E.I. Altman and R.J. Colton, Phys. Rev. B, 48, 1p. 8244, (1993).
- "Detonations at Nanometer Resolution Using Molecular Dynamics", D.W. Brenner, D.H. Robertson, M.L. Elert and C.T. White, Phys. Rev. Lett., 70, p. 2174, (1993).
- "Development of a Fiber-Optic Sensor for Trace Metal Detection in Aqueous Environments", A.M. Ervin, K.J. Ewing, R.A. Lamontagne, I.D. Aggarwal and D.A Rowley, Applied Optics, 32, (1993).
- "Dissociative Adsorption of H<sub>2</sub> Using the Close-Coupling Wave Packet Method", R.C. Mowrey, J. Chem. Phys., 99, p. 7049 (1993).

- "Distinctive Manifestations of Segmental Motion in Amorphous Poly(tetrahydrofuran) and Polyisobutylene", P.G. Santangelo, K.L. Ngai and C.M. Roland, *Macromolecules*, 26, p. 2682, (1993).
- "Effect of Atomic-Scale Surface Roughness on Friction: A Molecular Dynamics Study of Diamond Surfaces", J.A. Harrison, R.J. Colton, C.T. White and D.W. Brenner, *Wear*, 168, p. 127, (1993).
- "Effects of Long-Range Electron Transfer on Charge Transport in Static Assemblies of Redox Centers", D.N. Blauch and J.-M. Saveant, *J. Phys. Chem.*, 97, p. 6444, (1993).
- "Effects of Chemically-Bound, Flexible Hydrocarbon Species on the Frictional Properties of Diamond Surfaces", J.A. Harrison, C.T. White, R.J. Colton and D.W. Brenner, *J. Phys. Chem.*, 97, p. 6573, (1993).
- "Electrical Conductivity of Ladder-type Polymeric Transition-Metal Complexes Derived from 2,5-Diamino-1,4-Benzenedithiol", O.-K. Kim, T. E. Tsai, T. H. Yoon and L. S. Choi, *Synthetic Metals*, 59, p. 59, (1993).
- "Electrified Microheterogeneous Catalysis in Low Ionic Strength Media", D.R. Rolison and J.Z. Stemple, *J. Chem. Soc. Chem. Commun.* 1, p. 25, (1993).
- "Electrochemical Patterning of Amorphous Carbon on Diamond", M. Marchywka, P.E. Pehrsson, S.C. Binari and D. Moses, *J. Electrochem. Soc.*, 140, (1993).
- "Electronic Structure of Ladder Polymers", M. Kertesz, S.Y. Hong, Y.S. Lee and O.-K. Kim, *Synthetic Metals*, 57, p. 4344 (1993).
- "Electronic Structure of Highly Fluorinated C<sub>60</sub>", P.J. Benning, T.R. Ohno, J.H. Weaver, P. Mukherjee, J.L. Adcock, R.N. Compton and B.I. Dunlap, *Phys. Rev. B*, 47, p. 1589, (1993).
- "Energetics and Fullerene Fractionation", B.I. Dunlap, *Phys. Rev. B* 47, p. 4018, (1993).
- "Evaluation of Shipboard Formation of a Neurotoxicant (Trimethylolpropane Phosphate) from Thermal Decomposition of Synthetic Aircraft Lubricant", J. Wyman, E. Pitzer, F.W. Williams, J. Rivera, A. Durkin, J. Gehringer, P. Serve, D. Von Minden and D. Macys, *Amer. Indus. Hyg. Assoc. J.*, 54, p. 584, (1993).
- "Explosives Detection by <sup>14</sup>N Pure NOR", M.L. Buess, A.N. Garroway, J.B. Miller and J.P. Yesinowski, *Advances in Analysis and Detection of Explosives*, 361, (1993).
- "Far-Infrared Synchrotron Radiation for In Situ Studies of the Electrochemical Interface", A.E. Russell, G.P. Williams, A.S. Lin and W.E. O'Grady, *J. Electroanal. Chem.*, 356, p. 309, (1993).
- "First-Principles Electronic Properties of Model Silicon-Based Quantum Wires", J.W. Mintmire, *J. Vac. Sci. Technol.*, A 11, 1733, (1993).
- "Formation of Self-Arranging Mo Cubes", A.S. Edelstein, F.H. Kaatz, G.M. Chow, E.I. Altman, R.J. Colton, M.R. Pederson and M.J. Mehl, *Solid State Commun.*, 86, p. 323, (1993).
- "Fullerene as an Adsorbent for Gases and Vapours", M.H. Abraham, C.M. Du, J.W. Grate, R.A. McGill and W.J. Shuely, *J. Chem. Soc., Chem. Commun.*, 24, p. 1863, (1993).

"Giant Magnetic Moments in 4d Clusters", B.V. Reddy, S.N. Khanna and B.I. Dunlap, Phys. Rev. Lett., 70, p. 3323, (1993).

"Helical and Rotational Symmetries of Nanoscale Graphitic Tubules", C.T. White, D.H. Robertson and J.W. Mintmire, Phys. Rev. B, 47, p. 5485 (1993).

"High-Energy Collisions of Carbon Cluster Cations with Helium - Experimental Support for the Existence of Imperfect Fullerene Structures", J.H. Callahan, M.M. Ross, T. Weiske and H. Schwarz, J. Phys. Chem., 97, p. 20 (1993).

"Imide-Containing Phthalonitrile Resin", T. M. Keller, Polymer, 34, p. 952 (1993).

"In-situ Far-infrared Evidence for a Potential Dependence of Silver-Water Interactions", A.E. Russell, A.S. Lin and W.E. O'Grady, J. Chem. Soc. Faraday Trans., 89, p. 195, (1993).

"In-situ X-Ray Absorption Spectroscopy Studies of Nickel Oxide Electrodes", W.E. O'Grady, Synchrotron Radiation News, 6, p. 25, (1993).

"In-situ Fourier Transform IR Emission Spectroscopy of Diamond Chemical Vapor Deposition", P. Spiberg, R.L. Woodin, J.E. Butler and L. Dhar, Diamond and Related Materials, 2, p. 708, (1993).

"Influence of Imidazoline Content and Water on the Reaction between Amidoamine and Epoxy Resins", R.F. Brady, Jr. and J.M. Charlesworth, Journal of Coatings Technology, 65, p. 81, (1993).

"Intermolecular Cooperativity and the Temperature Dependence of Segmental Relaxation in Semicrystalline Polymers", K.L. Ngai and C. M. Roland, Macromolecules, 26, (1993).

"Interpretation of Force Curves in Force Microscopy", N.A. Burnham, R.J. Colton and H.M. Pollock, Nanotechnology, 4, p. 64, (1993).

"Ion/Molecule Reactions in Mixtures of Trimethylaluminum and Methylamines", S.B.H. Bach and D.C. Parent, J. Am. Soc. Mass Spectrom., 4, p. 111, (1993).

"Ion-Implanted, Outdiffusion Produced Diamond Thin Films", H.A. Hoff, D.J. Vestyck, Jr., J.E. Butler and J.F. Prins, Appl. Phys. Lett., 62, p. 34, (1993).

"Kinetics of Neutral Transition-Metal Atoms in the Gas Phase: Oxidation Reactions of Ti( $a^3F$ ) from 300 to 600K", M.L. Campbell and R.E. McClean, J. Phys. Chem., 97, p. 7942, (1993).

"Kinetics of the Reaction  $Al(2P) + H_2O$  over an Extended Temperature Range", R.E. McClean, H.H. Nelson and M.L. Campbell, J. Phys. Chem., 97, p. 9673, (1993).

"Kinetics of the Reactions  $VO(X^4\Sigma^-) + O_2, NO, \text{ and } CO_2$ ", R.E. McClean and L.R. Pasternack, Chem. Phys. Lett., 215, p. 1, (1993).

"Large Odd-Numbered Carbon Clusters from Fullerene/Ozone Reactions", S.W. McElvany, J.H. Callahan, M.M. Ross, L.D. Lamb and D.R. Huffman, Science, 260, p. 1632, (1993).

"Laser Ablation of  $NH_4NO_3$ ", L. Pasternack and J.K. Rice, J. Phys. Chem., 97, p. 12806, (1993).

"Lattice Expansion During Polyisoprene Crystallization from Blends", D.W. Tomlin and C.M. Roland, *Polymer*, 34, p. 2665, (1993).

"Low Energy Ion Implantation and Electrochemical Separation of Diamond Films", M. Marchywka, P.E. Pehrsson, D.J. Vestyck, Jr. and D. Moses, *Appl. Phys. Lett.*, 63, p. 3521, (1993).

"Microwave and Differential GPS Navigation Systems", J.R. McDonald, H.H. Nelson, and R. Robertson, *NRL Publication*, 244, p. 231, (1993).

"Molecular Weight of C<sub>60</sub> by Vapor Pressure Osmometry", R. Honeychuck, T. Cruger and J. Milliken, *J. Amer. Chem. Soc.*, 115, p. 3034, (1993).

"Molecule-Corrugated Surface Collisions: Converged Close Coupling Wave Packet and Quasiclassical Trajectory Calculations for N<sub>2</sub> Scattering from Corrugated Lattices", H.F. Bowen, D.J. Kouri, R.C. Mowrey, A.T. Yinnan and R.B. Gerber, *J. Chem. Phys.*, 99, p. 704, (1993).

"Multiple-Quantum NMR Dynamics in the Quasi-One-Dimensional Distribution of Protons in Hydroxyapatite", G. Cho and J.P. Yesinowski, *Chem. Phys. Lett.*, 205, p. 1, (1993).

"Nanostructured Co-Cu Powders via a Chemical Route", G.M. Chow, T. Ambrose, J. Xiao, F. Kantz and A. Ervin, *Nanostructured Materials*, 2, p. 131, (1993).

"Optical Limiter Using Lead Phthalocyanine", J.S. Shirk, R.G.S. Pong, F.J. Bartoli and A.W. Snow, *Appl. Phys. Lett.*, 63, p. 1880, (1993).

"Organometallic Chemical Vapor Deposition and Characterization of Indium Phosphide Nanocrystals in Vycor p. Porous Glass", D. Greg Hendershot, D. Gaskill, B.L. Justus, M. Fatemi and A. Berry, *Appl. Phys. Lett.*, 63, 3324, (1993).

"Origin of the Negative Excess Enthalpy in Poly(vinylethylene)/- cis-1,4-Polyisoprene Blends", C.M. Roland, J.B. Miller and K.J. McGrath, *Macromolecules*, 26, p. 4967, (1993).

"Phase Transitions in Polymer Blends via <sup>129</sup>Xe NMR Spectroscopy"  
J.H. Walton, J.B. Miller and C.M. Roland, *Macromolecules*, 26, p. 4052, (1993).

"Photodissociation of Dimethyl Sulfoxide at 193 nm in the Gas Phase", X. Chen, H. Wang, B.R. Weiner, M. Hawley, and H.H. Nelson, *J. Phys. Chem.*, 97, p. 12269, (1993).

"Potential Chlorofluorocarbon Replacements: OH Reaction Rate Constants Between 250 and 315K and Infrared Absorption Spectra", N.L. Garland, L.J. Medhurst and H.H. Nelson, *J. Geophys. Res.*, 98, p. 107, (1993).

"Primary and Secondary Trimethylsilylmethylstibines. Synthesis, Characterization and Chemical Vapor Deposition Properties", D.G. Hendershot and A.D. Berry, *J. of Organomet. Chem.*, 449, p. 119, (1993).

"Probing Thin-Film YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub>  Superconductors by Second Harmonic Generation Using Femtosecond Laser Pulses", S.W. McCauley, J.K. Rice, A.P. Baronavski, J.S. Horwitz and D.B. Chrisey, *Phys. Rev. B.*, 47, p. 6086, (1993).

"Production of Aluminum Clusters by Direct Laser Vaporization of Aluminum Nitride", S.B.H. Bach, S.W. McElvany and N.M. Wong, Chem. Phys. Ltrs., 209, p. 1, (1993).

"Quantitative Radioscopic Profile Analysis via Neural Networks", E. C. Greenawald and C.F. Poranski, Review of Progress in Quantitative Nondestructive Evaluation, 12, p.783, (1993).

"Rate of Chair-to-Chair Interconversion of Cyclohexane-d<sub>12</sub> in Its Neat Plastic Crystalline Phase", K.J. McGrath and R.G. Weiss, The J. Phy. Chem., 97, p. 2497, (1993).

"Relaxation Dynamics in PMPS/BMC Mixtures", C.M. Roland, P.G. Santangelo, K.L. Ngai and G. Meier, Macromolecules, 26, p. 6164, (1993).

"Relaxation Dynamics in Poly(methylphenylsiloxane), 1,1-Bis( -methoxyphenyl)cyclohexane, and Their Mixtures", C.M. Roland, P.G. Santangelo and K.L. Ngai and G. Meier, Macromolecules, 26, p. 6164, (1993).

"Resistance of Tin Dioxide to Chemical Reaction with Vanadate-Sulfate Melts", R.L. Jones, J. Am. Ceram. Soc., 76, p. 1635, (1993).

"S-Band ENDOR of Hyperfine Interactions of <sup>1</sup>H and <sup>14</sup>N Nuclei in Trinitrophenyl-methylnitroxide", M.D. Pace, T.C. Christidis and J.S. Hyde, J. Magn. Reson. Series A, 102, p. 101, (1993).

"Scanning Probe Microscopy of Thin Films", S.M. Hues, R.J. Colton, E. Meyer and H.-J. Güntherodt, Materials Research Society Bulletin, 18, p. 41, (1993).

"Scanning Tunneling Microscopic Study of the Interfacial Order in a Ferroelectric Liquid Crystal", S.L. Brandow, J.A. Harrison, D.P. DiLella, R.J. Colton, S. Pfeiffer and R. Shashidhar, Liq. Cryst., 13, p. 163, (1993).

"Similarity Solution in Buoyant Controlled Turbulent Diffusion Flame Modeling (Turbulent Buoyant Diffusion Flame Modeling)", M.A. Rivovorov, H. Zang, D.E. Ramaker and P.A. Tatem, Combustion and Flame, 92, p. 308, (1993).

"Small Scale Application of a Horizontal Ceiling/Floor Vent Algorithm", J.L. Bailey, P.A. Tatem and F.W. Williams, Combustion Science and Technology, 91, p. 347, (1993).

"Smart Sensor System for Trace Organic Vapor Detection: A System Using a Temperature-Controlled Array of Surface Acoustic Wave Vapor Sensors, Automated Preconcentrator Tubes and Pattern Recognition", J.W. Grate, S.L. Rose-Pehrsson, D.L. Venezky, M. Klusty and H. Wohltjen, Anal. Chem., 65, p. 1868, (1993).

"Smart Sensor System for Trace Organophosphorus and Organosulfur Vapor Detection Employing a Temperature-Controlled Array of Surface Acoustic Wave Sensors, Automated Sample Preconcentration, and Pattern Recognition", J.W. Grate, S.L. Rose-Pehrsson, D.L. Venezky, M. Klusty and H. Wohltjen, Anal. Chem., 65, p. 1868, (1993).

"Spectroscopic Evidence for a Nonrigid-Rigid Phase Change in Isotopically-Labeled (Benzene)<sub>13</sub>", A.P. Baronavski, D.C. Easter and M. Hawley, Chem. Phys. Lett., 206, p. 329, (1993).

"Spin Trapping of Nitrogen Dioxide Radical from Photolytic Decomposition of Nitramines", M. D. Pace and B. Kalyanaraman, Free Radical Biology and Medicine, 15, p. 337, (1993).

"Sputtered Ammonium Dinitramide: Tandem Mass Spectrometry of a New Ionic Nitramine", R.J. Doyle, Jr., *Organic Mass Spectrometry*, 28, p.83, (1993).

"Stability of the Silicon-Ruthenium Bond in the Presence of a Strong Nucleophile. Phase Sensitive  $^1\text{H}$  NMR COSY and Crystal Structure of  $\text{Ru}(\text{CO})_2(\text{NH}_2\text{CH}_2\text{C}_6\text{H}_5)_2\text{-}(\text{Si}(\text{C}_6\text{H}_5(\text{CH}_3)_2)_2\text{I})$ ", B.J. Rappoli, K.J. McGrath, C.F. George and J.C. Cooper, *J. Organomet. Chem.* 450, p. 85, (1993).

"Studies on Cure Chemistry of New Acetylenic Resins", S.B. Sastri, T.M. Keller, K.M. Jones and J.P. Armistead, *Macromolecules*, 26, p. 6171, (1993).

"Synthesis and Characterization of Spin Labeled Polymers for Composite Interface Studies", A.W. Snow and M.D. Pace, *Materials Science and Engineering*, A162, p. 233, (1993).

"Tensile and Fracture Properties of a Phthalonitrile Polymer", M. L. Warzel and T.M. Keller, *Polymer*, 34, p. 663, (1993).

"The Formation of Nitric Acid From Gas-Phase Ionic Complexes of Ammonium Nitrate", R.J. Doyle, Jr., *J. Am. Chem. Soc.*, 115, p. 5300, (1993).

"The Interaction of  $\text{C}_{60}$  Molecules with Noble Metal Surfaces", E.I. Altman and R.J. Colton, *Surface Science*, 295, p. 13, (1993).

"The Kinetics of Isothermal Crystallization of a Smectic Partially Fluorinated Alcohol by  $^2\text{H}$  NMR", K.J. McGrath and R.G. Weiss, *J. Phys. Chem.*, 97, p. 115, (1993).

"The Leachability of Guayule Resin from Treated Wood", J.D. Bultman and W.W. Schloman, Jr., *Industrial Crops and Products*, 2, p. 33, (1993).

"The NMR Chemical Shift of Xenon-129 Dissolved in Polymers", J.B. Miller, J.H. Walton and C.M. Roland, *Macromolecules*, 26, p. 5602, (1993).

"The Partitioning of Alkylpyridines Between Shale Fuel and Water", G.D. Foster, J. Harris, L. McClausand, W.M. Stalick and G.W. Mushrush, *Fuel Science & Technology*, 11, p. 349, (1993).

"The Plateau Modulus of Epoxidized Polybutadienes", C.M. Roland and J. Kallitsis, *Macromolecules*, 26, p. 6474, (1993).

"Thermal Expansion of Chemical Vapor Deposition Grown Diamond Films", S.B. Qadri, C. Kim, E.F. Skelton, T. Hahn and J.E. Butler, *Thin Solid Films*, 236, p. 103, (1993).

"Thin Film Diamond Growth Mechanisms", J.E. Butler and R.L. Woodin, *Phil. Trans. Roy. Soc. Lond.*, 342, p. 209, (1993).

"Ultrafast Relaxation in the Fluorescent State of the Laser Dye DCM", D.C. Easter and A.P. Baronavski, *Chem. Phys. Lett.*, 201, p. 153, (1993).

"Unusual Complexation Behavior of Poly(acrylic acid) Induced by Shear", O.-K. Kim, L.S. Choi, T. Long, K. McGrath, J.P. Armistead and T.H. Yoon, *Macromolecules*, 26, p. 379, (1993).



"Vanadate Hot Corrosion Behavior of India, Yttria-Stabilized Zirconia", R.L. Jones, R.F. Reidy and D. Mess, J. Am. Ceram. Soc., 76, p. 2660, (1993).

"Vibrational Distributions of NH ( $a^1\Delta$ ) from the Photolysis of HN<sub>3</sub> from 220-290 nm", M. Hawley, A.P. Baronavski and H.H. Nelson, J. Chem. Phys., 99, p. 2638, (1993).

"<sup>129</sup>Xe NMR in Polymers", J.B. Miller, Rubber Chemistry and Technology, 66, No.3, No. 3, p. 455, (1993).

"X-Ray Surface Diffraction Studies of the Restructuring and Electrodeposition of Pb Monolayers on Au(100) Single Crystals", K.M. Robinson and W.E. O'Grady, Faraday Discussions, 95, (1993).\*

"Dissociative Phase Transitions, Split Shock Waves, Rarefaction Shocks, and Detonations", C.T. White, D.H. Robertson, M.L. Elert, J.W. Mintmire and D.W. Brenner, Mat. Res. Soc. Symp. Proc. 296, p. 123, (1993).

"Electrochemical and Electric-Field Effects at Dispersions of Zeolites", D.R. Rolison, J.Z. Stemple and D.J. Curran, Proceedings of the 9th International Zeolite Conference, R von Ballmoos, J.B. Higgins, M.M.J. Treacy, Editors (Butterworth-Heinemann, Stoneham, MA) 699 (1993).\*

"Fullerenes: Synthesis, Properties and Chemistry of Large Carbon Clusters" (Book Review), J. Milliken, Molecular Crystals and Liquid Crystals, 226, p. 213, (1993).

"Theory for New Carbon-Based Materials", D.W. Brenner, R.C. Mowrey, J.W. Mintmire, J.A. Harrison, D.H. Robertson, M. Lyons, B.I. Dunlap and C.T. White, Mat. Res. Soc. Symp. Proc. 270, p. 275, (1993).

"A Smart Sensor System for Trace Organic Vapor Detection: A System Using a Temperature-Controlled Array of Surface Acoustic Wave Vapor Sensors, Automated Preconcentrator Tubes, and Pattern Recognition", J.W. Grate, S.L. Rose-Perhsson, M. Klusty and H. Wohltjen, Proceedings of the Chemical Sensor Symposium II, of the Electrochemical Society Meeting, 93, p. 597, (1993).\*

"Alkali Metals on III-V (110) Semiconductor Surfaces: Overlayer Properties and Manipulation Via STM", L.J. Whitman, J.A. Stroschio, R.A. Dragoset and R.J. Celotta, Atomic and Nanometer-Scale Modification of Materials: Fundamentals and Applications, Edited by Ph. Avouris (Kluwer Academic, Dordrecht, p. 25, 1993 ).

"Aromatic Acetylenes for Carbon Matrix Composite Material", K.M. Jones and T.M. Keller, PMSE Preprints, 68, pp. 97-98, (1993).

"Characterization of the Interaction of C<sub>60</sub> with Au(111)", E.I. Altman and R.J. Colton in Atomic and Nanoscale Modification of Materials: Fundamentals and Applications, Edited by Ph. Avouris (Kluwer Academic Publishers, pp. 303-314, 1993).

"Characterization Techniques for Complex Dielectric Studies of Electroactive Polymers", L.J. Buckley and S. Kolesar, Society of Plastics Engineers ANTEC Proceedings, May (1993).\*

"Chemical Adhesion Across Composite Interfaces", A.W. Snow and J. P. Armistead, 1993 NRL Review, 113, (1993).

"Decomposition of Environmentally Proscribed Chemicals by Electrified Microheterogeneous Catalysis", J.Z. Stemple and D.R. Rolison, Gordon Research Conference on Zeolitic and Layered Materials, Plymouth, NH, 21-25 June 1993.

"Delayed Initiation in a Model Energetic Material", D.H. Robertson, D.W. Brenner and C.T. White, Mat. Res. Soc. Symp. Proc., 296, p. 183, (1993).

"Destruction of Polychlorinated Aromatics in Aqueous Media by Electrified Microheterogeneous Catalysis", D.R. Rolison, E.A. Hayes and J.Z. Stemple, Extended Abstracts of the 185th Meeting of the Electrochemical Society, San Francisco, CA, pp. 22-27, May 1993.

"Detection of Trace Metals in Aqueous Systems Based on Fiber Optics", A.M. Ervin, R.A. Lamontagne, K.J. Ewing and I.D. Aggarwal, Field Screening for Hazardous Wastes & Toxic Chemicals, June, 1993. \*

"Direct Numerical Simulations of Stabilized Lifted Jet Diffusion Flames", C.R. Kaplan, S.W. Baek and E.S. Oran, Proceedings of 31st AIAA Meeting on Propellants & Combustion, January, 1993. \*

"Dynamics of An Unsteady Buoyant Ethylene Jet Diffusion Flame", C.R. Kaplan, S.W. Baek and E.S. Oran, Proceedings of 31st AIAA Meeting on Propellants & Combustion, January, 1993. \*

"Dynamics of an Unsteady Buoyant Ethylene Jet Diffusion Flame", C.R. Kaplan, S.W. Baek and E.S. Oran, Astronautics, #AIAA-93-0109, (1993).

"Effect of the Angular Momentum and Magnetic Quantum Numbers on Low Energy Auger Electron and Photoelectron Scattering", D.E. Ramaker, H. Yang and Y.U. Idzerda, Proc. Mat. Res. Soc. Symp., 295, p. 225, (1993).

"Evaluation of Shipboard Formation of a Neurotoxicant (Trimethylolpropane Phosphate) from Thermal Decomposition of Synthetic Aircraft Engine Lubricant", J. Wyman, E. Pitzer, F.W. Williams, J. Rivera, A. Durkin, J. Gehringer, P. Serve, D. Von Miden and D. Macys, Proceedings of Society of Toxicology 1993 Annual Meeting, New Orleans, LA, March, 1993.\*

"Ex-USS SHADWELL (LSD-15) Full Scale Control Test Ship", F.W. Williams, Defense Fire Protection Association Conference Proceedings, Washington Hilton, Washington, D.C., April, 1993. \*

"Field Test and Storage Stability of a Dosimeter System for Unsymmetrical Dimethylhydrazine, Monomethyl Hydrazine and Hydrazine", K.P. Brenner and S.L. Rose-Pehrsson, Proceedings of the 1993 JANNAF Safety and Environmental Protection Subcommittee, CPIA Publication 600, August, 1993.\*

"Fire Extinguishment by Fire Aerosol Generation", R.S. Sheinson, H.G. Eaton, R.G. Zalosh, B.H. Black, and W. Smith, Proceedings of the 1993 CFC & Halon Alternatives Conference, Washington, DC, October, 1993. \*

"Fire Suppression Agent Effectiveness Prediction and Implications for Fire Extinguishment Tests", R.S. Sheinson and S.P. Baldwin, Eastern States Section/Combustion Institute, Princeton, NJ, October, 1993.

"Fluorescence Cure Studies of Amino-Epoxy Systems", R.F. Brady, Jr. and J.M. Charlesworth, Proceedings of 19th International Conference in Organic Coatings Science Technology, 19, pp. 49-58, (1993).\*

"Fluoropolymer and Silicone Fouling Release Coatings", J.D. Bultman and J.R. Griffith, Proceedings of the International Symposium on Marine Biofouling and Corrosion, Portsmouth University, England, 13-16 July 1993.\*

"Friction and Energy Dissipation at the Atomic Scale - A Review", I.L. Singer, Dissipative Process in Tribology - Proceedings of the 20th Leeds-Lyon Symposium on Tribology, Villeurbanne, France, 7-10 September 1993.\*

"Full-Scale Shipboard Fires", F.W. Williams, J. Wong and J.P. Scheffey, Proceedings of the Second Workshop on Developing a Predictive Capability for CO Formation in Fires, New Orleans, LA, 1993. \*

"Full Scale Shipboard Fires", F.W. Williams, J.T. Wong, and J.T. Scheffey, The Combustion Institute Conference Proceedings, 1993. \*

"Halogen Acid Production in an Intermediate Scale Replacement Halon 1301 Fire Suppressant Test", W.D. Smith, R.S. Sheinson, H.G. Eaton, R. Brown, G. Salmon, H. Burchell and H.J. St. Aubin, Proceedings of the INTERFLAM '93 - Triennial International Fire Conference, University of Oxford, Oxford, England, p. 757, 1993. \*

"How Universal Are Universal Parameters in Turbulence Models", M.A. Pivovarov, H. Zhang, D.E. Ramaker, P.A. Tatem and F.W. Williams, Proceedings of the Eastern States Combustion Institute Conference - Princeton University, Princeton, NJ, October, 1993. \*

"In-Situ X-ray Diffraction of Electrodeposited Pb on Au(100) and Au(111) Single Crystal Electrodes", K.M. Robinson and W.E. O'Grady, Extended Abstracts Volume to 183rd Meeting of the Electrochemical Society, Honolulu, HI, 16-21 May 1993.\*

"International CFC & Halon Alternatives Conference 1993", R.S. Sheinson, H.G. Eaton, R.G. Zalosh, B.G. Black, R.A. Brown, H. Burchell, G. Salmon and W.D. Smith, Conference Proceedings, 1993.\*

"Liquid Phase Oxidation of Organo-Sulfur Compounds by Hydroperoxides", G.W. Mushrush, E.J. Beal, D.R. Hardy, R.N. Hazlett and D.G. Mose, Proceedings of the Eastern Oil Shale Symposium, Institute for Mining and Minerals Research, 1993.\*

"Modes of Chemical Suppression Action: Guidance for Agent Evaluation", R.S. Sheinson, H.G. Eaton, R. Brown, H. Burchell, J. St. Aubin and W.D. Smith, Halon Alternatives Technical Working Conference 1993, Albuquerque, NM, May, 1993. \*

"Morphological Studies of Polyurethane-Diacetylenes", L.J. Buckley and M. F. Rubner, American Chemical Society, Polymer Preprints, 35, (1993).

"New Development of Polymer Science and Technology Conference Report on 4th SPSJ International Polymer Conference", O.-K. Kim, Scientific Information Bulletin (ONR Asian Office), 18, p. 23, (1993).

"Nitrogen Radicals from Thermal and Photochemical Decomposition of Ammonium Perchlorate, Ammonium Dinitramide, and Cyclic Nitramines", M.D. Pace, Mat. Res. Soc. Symp. Proc., 296, pp. 53-60, Materials Research Society, (1993).

"Nuclear Magnetic Resonance Imaging of Anisotropic Solid-State Chemical Reactions", L.G. Butler and K.M. Dooley, D.G. Cory, J.B. Miller and A.N. Garroway, Code 6122 ACS Symposium Series 517, Selectivity in Catalysis, (1993).

"Orientation and Mechanical Response of Elastomers Containing Double Networks", C.M. Roland, P.G. Santangelo, I.S. Choi and J.B. Miller, 205th ACS National Meeting, Polymer Science and Engineering 28 March - 2 April 1993.\*

"Oxidation of CVD Diamond Studied by High Resolution Electron Energy Loss Spectroscopy", P.E. Pehrsson, B.D. Thoms and J.E. Butler, Proceedings of the Third International Symposium on Diamond Materials, Honolulu, HI, 16-21 May 1993.\*

"Pattern Recognition Analysis of A Surface Wave Sensor Array System for Trace Organic Vapor Detection", S.L. Rose-Pehrsson, J.W. Grate and M. Klusty, Proceedings of the Chemical Sensor II Symposium of the 1993 Electrochemical Society Meeting, Vol. 93, p. 609, (1993).\*

"Pi Overlapping Ring Systems Contained in a Homogenous Assay - A Novel, Homogenous Assay for Antigens", D.A. Kidwell, Proceedings of International Society for Optical Engineering Conference, 1885 Advances in Fluorescence Sensing Technology, Los Angeles, CA, 16-22 January 1993.\*

"Polymer Design for Minimally Adhesive Surface", K.J. Wynne, T. Ho, X. Chen and J.A. Gardella, Jr., Proceedings of Pacific Polymer Conference, Symposium Volume, Gold Coast, Australia, December 1993 \*

"PORSCHA - A Novel, Homogeneous Assay for Antigens", D.A. Kidwell, SPIE International Symposium on Biomedical Optics, Los Angeles, CA, 16-22 January 1993.

"Preparation and Characterization of Samarium Phthalocyanine Complexes", M.E. Boyle, R.F. Cozzens and R.A. Keyer, ACS Inorganic Division Abstracts, "206th National Meeting of the American Chemical Society", Chicago, IL, INOR-140, August 1993

"Processable Fluoropolymers with Low Dielectric Constants: Preparation and Structure-Property Relationships of Polyacrylates and Polymethacrylates", J.S.-W. Hu and J.R. Griffith, Polymer Preprint and Chemical Abstract ACS Div. of Polymer Chemistry, ACS, Denver, CO, 28 March -3 April 1993

"Processable Fluoropolymers with Low Dielectric Constants: Acrylates, Methacrylates, and Alkyl Ethers", H.S.-W. Hu and J.R. Griffith, and Chemical Abstract, ACS Div of Polymer Chemistry, 1993 Gordon Research Conference on the Chemistry, Physics of Coatings and Films, 2-6 August 1993, New London, NH

"Solution Equilibria of Dihydroxyanthraquinone with Lanthanide Metals", B.J. Rappoli, and D.A. Rowley, Proceedings of American Chemical Society Conference, Chicago, IL 1993.\*

"Spin Labelled Polymers for Composite Interface Studies: Synthesis and Characterization", A.W. Snow and M.D. Pace, Polymer Preprints, ACS, Denver, CO, 34(1), 871 (1993)

"Studies of the Hot Corrosion Resistance of India-Stabilized Zirconia", R.L. Jones and D. Mess, Proceedings of the 1992 Coatings for Advanced Heat Engines Workshop, Naval Postgraduate School, Monterey, CA, 3-6 August 1992.\*

"Supramolecular Ordering in Amylose Inclusion Complexes of Photoreactive Molecules", O.-K. Kim and L.S. Choi, Polymer Preprints, ACS, Denver, CO, 34, 749 (1993)

"Surface Science, Tribology, and the NAVY's Aging Fleet", I.L. Singer, Proceedings for Condition-based Maintenance Workshop, Atlantic Beach, NC, 15-17 November 1993.\*

"The Acid-Cleaned CVD Diamond Surface", P.E. Pehrsson, Proceedings of the 3rd International Symposium on Diamond Materials, Honolulu, HI, 16-21 May 1993.\*

"The Dynamics of Lifted Jet Diffusion Flames", C.R. Kaplan, S.W. Baek and E.S. Oran, Proceedings of the Forteenth International Colloquium on Dynamics of Explosions and Reactive Systems, Coimbra, Portugal, 1-6 August, 1993.\*

"The Fluorescent Detection of Hydrazine, Monomethylhydrazine and 1,1-Dimethylhydrazine by Derivatization with Aromatic Dicarboxaldehydes", G.E. Collins and S.L. Rose-Pehrsson, Proceedings of the 1993 JANNAF Safety and Environmental Protection Subcommittee Meeting, CPIA Publication 600, August 1993.\*

"The Formation of Nitric Acid and Nitric Acid Complexes From Gas-Phase Ammonium Nitrate Clusters", R.J. Doyle, Jr., Proceedings of the 41st American Society for Mass Spectrometry Conference on Mass Spectrometry, San Francisco, CA, 3 June 1993.\*

"The Quest for Halon Replacement", R.S. Sheinson, S.P. Baldwin, R. Brown, D.C. Driscoll, H.G. Eaton, H.J. St. Aubin, and W.D. Smith, Proceedings of INTERFLAM '93 Fire Conference, London, England, p. 739, March 1993 \*

"Thermal Properties of Nonlinear Optical Materials via a Guest Host Process", S.-F. Lau, A.J. Sosnowik, L.-S. Choi and O.-K. Kim, 22nd NATAS Conference Proceedings, 433, 19-22 September 93.\*

"Thermally and Oxidatively Stable Carborane-Siloxane-Acetylenic-Based Thermosetting Polymers", L.J. Henderson and T.M. Keller, Polymer Preprints, 34(1), 419-420 (1993).

"Thermally and Oxidatively Stable Carborane-Siloxane-Acetylenic-Based Thermosetting Polymers", L.J. Henderson and T.M. Keller, Polymer Preprints, 34(1), 345-346 (1993).

"Total Flooding Fire Suppressant Testing in a 56 m<sup>3</sup> (2000 ft<sup>3</sup>) Compartment", R.S. Sheinson, H.G. Eaton, R. Brown, H. Burchell, J. St. Aubin and W.D. Smith, Halon Alternatives Technical Working Conference 1993, Albuquerque, NM, May 1993.

"Tribological Coatings Deposited by Ion Beam Assisted Deposition and Pulsed Laser Deposition", F.A. Smidt, R.A. Kant, L.E. Seitzman, C.A. Carosella, J.S. Horwitz and M.S. Donley, Proceedings of the 1992 Coatings for Advanced Heat Engines Workshop, Monterey, CA, 3-6 August 1993.\*

"Trinitro Azetidine Under Extreme Conditions", T.P. Russell, G.J. Piermarini and P.J. Miller, Proceedings of the ONR/LANL Workshop on Shock and Thermal Initiation, Los Alamos, NM, 10 October 1993.\*

"Visualization of X-Ray Backscatter Data", C. F. Poranski, E. Greenawald and Y. Ham, Summaries of the 1993 ASNT Fall Conf., ASNT, Inc., 48, (1993).

"Wind Effects on Post-Flashover Fire Tests Onboard the ex USS SHADWELL", J. Wong and F.W. Williams, Proceedings of the Eastern States Combustion Institute Conference - Princeton University, Princeton, NJ, 1993 \*

"X-Ray Backscatter Inspection of Low Density, Low Atomic Number Materials", Y.S. Ham, E.C. Greenawald and C.F. Poranski, Jr., Proceedings: Radiologic NDT III, 68 (1993).\*

"A Classical Representation for a Mass Based Chemical Potential", J.P. Thomas, Int. J. Engng Sci. Vol. 31, No. 9, 1993, pp 1279-1294, 1993.

A Commentary on "On Dispersions of Voids as Sources of Strength", Part I: Analysis of the Process R.K. Everett Phil. Mag. Letters, Taylor & Francis, Ltd., 1993.

A Commentary on "On Dispersions of Voids as Sources of Strength", Part II: Consequences of Bubbles in Metals R.K. Everett Phil. Mag. Letters, Taylor & Francis, Ltd., 1993.

"A Comparison of the Interphase Development and Mechanical Properties of Nicalon and Tyranno SiC Fiber-Reinforced ZrTiO<sub>4</sub> Matrix Composites", B.A. Bender, and T.L. Jessen Journal of Materials Research, 1993.

"A Microstructural Study Comparing CFCMCs with Differing Mechanical Properties", T. Jessen, B. Bender, A. Pattnaik, and R. Everett Ceramic Engineering and Science Proceedings, 1993.\*

"A Monovariabe Representation of Three-Dimensional Blood Flow in a Large Elastic Artery I" S.G. Lambrakos; J.F. Paquerot (Lab. Ondes et Structures Coherentes, France), Physical Review, 1993.

"A Numerical Model for Deep Penetration Welding Processes", S.G. Lambrakos, E.A. Metzbower, P.G. Moore, J.H. Dunn, and A. Monis JMEPEG (1993) 2: 819-838.

"A Small Angle X-Ray Scattering Study of Self Arranged Mo Particles" L.J. Martinez-Miranda (Univ of Penn); G.M. Chow, and A.S. Edelstein Journal of Materials Research

"A Study of the Proximity Effect at Oxide Superconductor -Normal Metal Interfaces" J.H. Claassen, P.R. Broussard, and V.C. Cestone; R. Hu (TRW) IEEE Transactions on Applied Superconductivity, Vol. 3, No. 1, March 1993, p 1277.

"A Theoretical Evaluation of Crack Closure", N. Louat (Fairfax Materials Group); K. Sadananda; M. Duesbery (Fairfax Materials Group); A.K. Vasudevan (ONR) Metallurgical Transactions A, Vol. 24A, October 1993, p 2225.

"An Historical Perspective of Key Issues in the Magnetism and Structure of Systems of Reduced Dimensions." G.A. Prinz, Magnetism and Structure in Systems of Reduced Dimension, Edited by R.F.C. Farrow et al, Plenum Press, New York, 1993, p 1

"Analysis and Modeling of Fiber Clustering in Composites Using N-Tuples", R.K. Everett Scripta Metallurgica et Materialia, Vol. 28, pp 663-668, 1993.

"Analysis of Solutions from Crevices on Alloy C276 in Natural Seawater", F.D. Bogar, E. McCafferty, P.M. Natishan, and E.D. Thomas 1993 Annual Meeting of the Virginia Academy of Science, 19-21 May 1993, Old Dominion University/Virginia Journal of Science, 1993.

"Anomalous Temperature Dependence of the Upper Critical Magnetic Field in Bi-Sr-Cu-O", M. Osofsky, R. Soulen, Jr., and S. Wolf; J. Broto, H. Rakoto, J. Ousset, G. Coffe, S. Askenazy (Service National Des Champs Magnetique Pulses, France); P. Pari (Centre d'Etudes de Saclay); I.

Bozovic, J. Eckstein, G. Virshup (Varian Associates) Physical Review Letters, Vol. 71, No. 14, 4 October, p 2315, 1993.

"Anomalous Temperature Dependence of the Upper Critical Magnetic Field in Bi-Sr-Cu-O", M.S. Osofsky, R.J. Soulen, Jr., and S.A. Wolf; J.M. Broto, H. Rakoto, J.C. Ousset, G. Coffe, S. Askenazy, P. Pari, I. Bozovic, J.N. Eckstein, and G. F. Virshup, Physical Review Letters, 1993.

"Atomic Mechanisms of Diffusional Nucleation and Growth and Comparisons with Their Counterparts in Shear Transformations", H. I. Aaronson, Metallurgical Transactions A, Vol. 24A, February 1993, pp 241-276.

"Auger Intensity Mapping of Monolayers of Ni/Cu (001)", Y. Idzerda, and G.A. Prinz Surface Science Letters 284 (1993) L394-L398.

"Bainite in Steels", S.C. Sanday; H.I. Aaronson, Journal of Metals, 1993.

"Cascading Synchronized Chaotic Systems", T.L. Carroll, and L.M. Pecora, Physica D 67 (1993) 126-140

"Chaotic Synchronization in Hamiltonian Systems" J.F. Heagy and T.L. Carroll, The Journal "Chaos" .

"Characterization of On-off Intermittency" J. G. Heagy; N. Platt, and S.M. Hammel, Physical Review E

"Characterization of Thin Film Composite Mixtures of Y1Ba2Cu3O7-y and Y2Ba1Cu1O5", P.R. Broussard, V.C. Cestone, L.H. Allen, and S.A. Wolf, IEEE Transactions on Applied Superconductivity, Vol. 3, No. 1, March 1993, p 1472.

"Circuits That Get Chaos in Sync", J. Neff, T. Carroll Scientific American, August 1993, p 120

"Classification of Fatigue Crack Growth Behavior", A. K. Vasudevan and K. Sadananda Metallurgical Transactions, 1993.

"Coexistence of Brillouin and van Vleck Sin Exchange in Zn1-xMnXSe/Zn1-yFeySe Spin Superlattice Structures" B.T. Jonker, and H. Abad; L.P. Fu, W.Y. Yu, and A. Petrou, J. Warnock, J. Appl. Phys.

"Coherence Effects in Hall Measurements of Heavy Fermion Compounds", G.M. Roesler, Jr, P.M. Tedrow, Physica C, 1993.

"Comparison of the Interphase Development and Ultimate Strength Between Nicalon and Tyranno Silicon Carbide-Fiber-Reinforced Zirconia Titanate Matrix Composites", B.A. Bender, and T.L. Jessen Ceramic Engineering and Science Proceedings, September - October 1993, The American Ceramic Society, p 931.\*

"Comparison of the Spin-Splittings Between the e1h1 and e2h2 Excitons in a ZnSe/Zn0.85Mn0.15Se Multiple Quantum Well Structure", L.P. Fu, S.T. Lee, and A. Petrou, J. Warnock, B.T. Jonker, Physical Review ,1 993.

"Competing Spin Exchange Interactions in Zn1-xMnxSe/Zn1-yFeySe Multiple Quantum Well Structures", L.P. Fu, W.Y. Yu, and A. Petrou, J. Warnock, B.T. Jonker Physical Review B, Vol. 48, No. 24, 15 December 1993-II, p 18 272.

"Constitutive-Operator Smoothing by Condensation", L.D. Flippen Jr. Computers Math. Applic. Vol. 27, No. 6, pp. 5-18, 1993.

"Construction and Evaluation of a Noise-Suppressing Hydrophone", A.J. Zain, and W. Thompson, Jr., M. Kahn J. Acoust. Soc. Am. 94 (2), Pt. 1, August, p 642, 1993.

"Correlation of Magnetic and Structural Anisotropy in Amorphous TB-FE Via EXAFS", V. Harris (Post Doc), W.T. Elam, and N.C. Koon Journal of Magnetic Society of Japan, Vol. 17, Supplement S-1, p 267-271, 1993.

"Correlation of X-ray Diffraction and Mossbauer Effect Measurement with Magnetic Properties of Heat-Treated Cu<sub>80</sub>Co<sub>15</sub>Fe<sub>5</sub> Ribbons", V. Harris, M. Rubinstein, B.N. Das, and N.C. Koon MMM 93 Conf, 15-18 Nov, Journal of Applied Physics, 1993.

"Counter Rotating Fluid Atomization" K.P. Cooper, and J.D. Ayers The International Journal of Powder Metallurgy Vol. 29, No. 3, p 215, 1993.

"Creep of Intermetallic Composites" K. Sadananda, and C.R. Feng Materials Science and Engineering, A170, 199-214, 1993.

"Critical Thickness of Single Crystal fcc-Iron on Diamond", H.A. Hoff, G.L. Waytena, and J.W. Glesener; D.P. Pappas, Surface Science, 1993.

"Diamond Growth in Turbulent Oxygen-Acetylene Flames", K.A. Snail, R.G. Vardiman, J.P. Estrera, J.W. Glesener, C. Merzbacher, C.J. Craigie, C.M. Marks, R. Glosser, J.A. Freitas, Jr., J. Appl. Phys. 74 (12), 15 December 1993, pp 7561-7571, 1993.

"Direct Observation of Microscopic Inhomogeneities with Energy-Dispersive Diffraction of Synchrotron-Produced X-rays", E.F. Skelton, A.R. Drews, M.S. Osofsky, and S.B. Qadri; J.Z. Hu, T.A. Vanderah, J.L. Peng, and R.L. Greene, Science, Vol. 263, 11 March 1994, p 1416.

"Dislocations and Disclinations in Transversely Isotropic Elastic Solids", H.Y. Yu, S.C. Sanday", Journal of the Mechanics & Physics of Solids, 1993.

"Effects of Oxygen Inhomogeneities on the Properties of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub>  Crystals", M.S. Osofsky, J.L. Cohn, E.F. Skelton, M.M. Miller, R.J. Soulen, Jr., and S.A. Wolf Materials Science Forum Vol. 137-139 (1993) pp 229-246.

"Elastic Fields Due to Centers of Dilatation and Thermal Inhomogeneities in Plane-Layered Solids." H. Yu and S.C. Sanday, J. Mech. Phys. Solids, Vol. 41, No. 2, 1993, pp 267-296.

"Elastic Fields Due to Defects in Transversely Isotropic Bimaterials", H.Y. Yu, S.C. Sanday, and B.B. Rath; C.I. Chang, Proceedings A, the Royal Society of London, 1993.\*

"Elastic Properties of Bi<sub>2</sub>Sr<sub>2</sub>CaCu<sub>2</sub>O<sub>x</sub> Whiskers", R.L. Jacobsen, T.M. Tritt, A.C. Ehrlich, and D.J. Gillispie Physical Review B, Vol. 47, No. 13, 1 April 1993-I, p 8312

"Electrochemical Properties of NiCl<sub>2</sub>-Intercalated and Reduced-NiCl<sub>2</sub>-Intercalated Graphite", P.P. Trzaskoma, R.K. Everett, A.S. Edelstein, B. Maruyama, and F.H. Kaatz; L. Vogel, J. Electrochem. Soc., Vol. 140, No. 6, June 1993, L103-L106

"Electron and Hole Spin Lifetimes in Zn<sub>1-x</sub>Mn<sub>x</sub>Se and Zn<sub>1-y</sub>Fe<sub>y</sub>Se Based Heterostructures", B.T. Jonker; J. Warnock, L.P. Fu, W.Y. Yu, W.C. Chou and A. Petrou, J. Vac. Sci. Technol. A 11 (4), Jul/Aug 1993, pp 1033-1038



"Element Specific Magnetic Hysteresis, A New Means for Studying Heteromagnetic Multilayers", H.-J. Lin, C.T. Chen, and G. Meigs, Y. Idzerda, A. Chaiken, and G.A. Prinz; G.H. Ho, APS 1992 March Meeting, 22-26 March 1993, Seattle, WA/Bulletin of American Physical Society, APS

"Element-Specific Magnetic Hysteresis as a Means for Studying Heteromagnetic Multilayers", C.T. Chen, Y.U. Idzerda; H.-J. Lin and G. Meigs, A. Chaiken, and G.A. Prinz; G.H. Ho, Physical Review B, Vol. 48, No. 1, 1 July 1993-I, p 642.

"Element-Specific Magnetic Hysteresis Measurements, A New Applicant of Circularly Polarized Soft-X-Rays", H.-J. Lin, C.T. Chen, and G. Meigs, Y.U. Idzerda, A. Chaiken, and G.A. Prinz; G.H. Ho, Proceedings of SPIE Conf., 1993.\*

"Evidence for Strong Electron-phonon Coupling from the Specific Heat of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-Δ</sub>", M.E. Reeves; D.A. Ditmars, S.A. Wolf; T.A. Vanderah, V.Z. Kresin, Physical Review B, Vol. 47, No. 10, 1 March 1993-II, p 6065.

"Evidence of Two Gap s-Wave Superconductivity in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> from Microwave Surface Impedance Measurements", N. Klein, N. Tellmann, H. Schulz, and K. Urban, Physical Review Letters, Vol. 71, No. 20, 15 November 1993, p 3355.

"Exciton Energies in Shallow Quantum Wells and Spin Superlattices", J. Warnock, B.T. Jonker; A. Petrou, W.C. Chou, and X. Liu, Physical Review B, Vol. 48, No. 23, 15 December 1993-I, p 17 321.

"Failure Resistant Ceramic Laminate Structures", T.L. Jessen, B.A. Bender, and D. Lewis, III Ceramic Engineering & Science Proceedings, September - October 1993, The American Ceramic Society, p 914.\*

"Ferromagnetic Resonance and Spin Anisotropy in Iron Oxide Thin Films and Iron Oxide/Nickel Oxide Superlattices", J.J. Krebs; D.M. Lind and S.D. Berry, J. Appl. Phys. 73 (10), 15 May 1993, pp 6457-6459

"Formation of Self-Arranging Mo Cubes", A.S. Edelstein, F.H. Kaatz, C.M. Chow, E.I. Altman, R.J. Colton, M.R. Pederson, and M.J. Mehl Solid State Communications, Vol. 86, No. 5, 1993, pp 323-326

"Glass Fibres with Fine Conducting Cores", J.D. Ayers Journal of Materials Science 28 (1993) 2337-2346.

"Grain Growth of High T<sub>c</sub> YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub>", L.E. Richards, H. A. Hoff, and P.K. Aggarwal Journal of Electronic Materials, Vol. 22, No. 10, 1993 (Special Issue Paper) pp 1233-1239.

"Growth and Characterization of a New Diluted Magnetic Semiconductor, Zn<sub>1-x</sub>EuxSe", B.T. Jonker, L.D. Peterson, and J.J. Krebs J. Appl. Phys. 73 (10), 15 may 1993, pp 5742-5744

"Growth and Magnetic Characterization of fcc Co on (001)-Diamond", J.A. Wolf, J.J. Krebs, and G.A. Prinz Journal Applied Physics Letters, 1993.

"High Energy Ion Beam Surface Modification of Aluminum", E. McCafferty, P.M. Natishan, and G.K. Hubler Interface, 1993.

"High Temperature Superconductivity: Magnets and Applications of Naval Interest" D.U. Gubser, T.L. Francavilla, and R. Soulen, Jr.; D.L. Mitchell, Journal of Electronic Materials, Vol. 22, No. 10, 1993, pp 1305-1309 (Special Issue Paper).

"Hot Forming of a Nicalon SiC Fiber/Zirconia-Titania Matrix Composite", B.A. Bender, and T.L. Jessen Ceramic Engineering and Science Proceedings, September - October 1993, The American Ceramic Society, p 736.\*

"Induction-Drive Magnetohydrodynamic Propulsion", D.L. Mitchell, D.U. Gubser Journal of Superconductivity, Vol. 6, No. 4, 1993, pp 227-235.

"Inexpensive Spot-Profile Analysis Reflection High Energy Electron Diffraction", Y. Idzerda J. Vac. Sci. Technol. A 11 (6), Nov/Dec 1993, pp 3138-3140.

"Influence of Intralayer Quantum-Well States on the Giant Magnetoresistance in Magnetic Multilayers", A.C. Ehrlich Physical Review Letters, Vol. 71, No. 14, 4 October 1993, pp 2300-2303.

"Influence of the Josephson Junction on the Impedance and Noise of a Resistive Superconductive Quantum Interference Device", R.J. Soulen, Jr., W.E. Fogle, J.H. Colwell, J.L. Cohn, H. Seppa J. Appl. Phys. 74 (8), 15 October 1993, pp 5241-5249.

"Interpolation-Based Condensation of Algebraic Semi-Discrete Models with Frequency Response Application", L.D. Flippen, Jr. Computers and Mathematics with Applications, Pergamon Press, 1993.

"Ion Implanted. Outdiffusion Produced Diamond Thin Films", H.A. Hoff, D.J. Vestyck, Jr., and J.E. Butler; J.F. Prins (Univ. of the Witwatersrand, S. Africa) Appl. Phys. Lett. 62 (1), 4 January 1993, pp 34-36.

"Keyhole Formation" E.A. Metzbower Metallurgical Transactions B, Vol. 24B, October 1993, pp 875-880.

"Layered BN-Coated/As-Received Unidirectional Fiber CFCCs with Enhanced Mechanical Performance", T.L. Jessen, and B.A. Bender Ceramic Engineering and Science Proceedings, 1993.\*

"Lead Loss During Sintering of PZT Ceramics: Part I. Lead Transport Phenomena", M. Kahn; M. Chase, and S. Zain, Journal of the American Ceramics Society, 1993.

"Lead Loss During Sintering of PZT Ceramics: Part II. Effects of Lead Loss on Piezoelectric Properties", M. Kahn; M. Chase, and S. Zain, Journal of the American Ceramics Society, 1993.

"Lead Loss Mechanisms During Sintering of PZT Ceramics", M. Kahn; M. Chase (Potomac Research) ONR Transducer Review, MRL, Penn State, 6 April 1993/Journal American Ceramic Society, 1993.

"Line-Shape Analysis of Reflectance Spectra from ZnSe/Zn<sub>0.99</sub>Fe<sub>0.01</sub>Se Spin Superlattices", K. Chern-Yu, and W.C. Chou, A. Twardowski, W.Y. Yu, S.T. Lee, and A. Petrou, J. Warnock, B.T. Jonker J. Appl. Phys., 1993.

"Location and Estimation of Damage in a Beam Using Identification Algorithms" D.K. Lindner (Virginia Tech); G. Kirby", 35th Structures, Structural Dynamics and Materials

Conference, Adaptive Structures Forum, 18-22 April 1994, Hilton Head, SC/Conf Proceedings (refereed), 1993.\*

"Long Hole Spin Relaxation Times in Diluted Magnetic Semiconductor Heterostructures", B.T. Jonker; L.P. Fu, W.Y. Yu, W.C. Chou, and A. Petrou, J. Warnock, Journal of Electronic Materials, Vol. 22, No. 5, 1993, p 489.

"Magnetic and Structural Characteristics of Epitaxial  $\text{Fe}_x\text{Co}_{1-x}$  Alloy Films on ZnSe (001)", C.J. Gutierrez, V. Harris, J.J. Krebs, W.T. Elam, and G.A. Prinz, J. Appl. Phys. 73 (10), 15 May 1993, p 6763.

"Magnetic and Structural Studies of Epitaxial (001) Fe and (001)  $\text{Fe}_x\text{Co}_{1-x}$  Alloy Film Structures", C.J. Gutierrez, G.A. Prinz, J.J. Krebs, M.E. Filipkowski, V.G. Harris, and W.T. Elam, Journal of Magnetism and Magnetic Materials 126 (1993), pp. 232-238.

"Magnetic Circular Dichroism of  $\text{Fe}_x\text{Co}_{1-x}$  Alloy Single Crystal Thin Films", Y.U. Idzerda, and C.J. Gutierrez, L.H. Tjeng, L.-J. Lin, G. Meigs, and C.T. Chen, Journal of Magnetism and Magnetic Materials 127 (1993) pp. 109-114.

"Microwave Surface Impedance of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  S-Wave Versus D-Wave Pairing", N. Klein and N. Tellmann, S.A. Wolf, V.Z. Kresin, Journal of Superconductivity, Proceedings of Molecular and Oxide Superconductivity Conf., 1993.\*

"Model for the Oxygenation of the  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  90K Superconductor", H.A. Hoff, L.E. Toth, M.E. Filipkowski, C.L. Vold, S.H. Lawrence, and R.A. Masumura; W.L. Lechter, D.K. Smith, Journal of Electronic Materials, Vol. 22, No. 10, 1993 (Special Issue Paper) pp. 1241-1249

"Modeling Frequency Fluctuations and Noise Thermometry Using an R-Squid Noise Thermometer", R.J. Soulen, Jr., W.E. Fogle, and J.H. Colwell, IEEE Transactions on Instrumentation and Measurement, Vol. 42, No. 2, April 1993, p 320.

"Modeling Microstructural Evolution of Multiple Texture Components During Recrystallization", R.A. Vandermeer; J. Jensen, Acta Metallurgica et Materialia, 1993.

"Modeling of Non-Uniform Composite Microstructures", R.K. Everett, and J.H. Chu, Journal of Composite Materials, Vol. 27, No. II /1993, p 1128.

"Modification of the X-ray Photoemission Spectrum of In Situ Deposited Thin Films of  $\text{Y}_1\text{Ba}_2\text{Cu}_3\text{O}_{7-y}$  for Various Oxygen Treatments", P.R. Broussard, and V.C. Cestone, J. Vac. Sci. Technol. A 11 (6), Nov/Dec 1993, pp 3099-3105.

"Morphology and Transport of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  Sputtered in Argon, Oxygen, and Hydrogen: Dependence on Deposition Temperature", E.J. Cukauskas, L.H. Allen, G.K. Sherrill (SFA), R.T. Holm, and C. Vold, J. Appl. Phys. 74 (11), 1 December 1993, pp 6780-6787.

"Magnetic Field Dependence of d.c. Critical Current for Large Samples of Textured Bulk Y-Ba-Cu-O", T.L. Francavilla; R.L. Meng, Cryogenics 1993 Vol 33, No 3, p 256.

"Magnetic Properties of Heat Treated  $\text{Co}_{80}\text{Cu}_{15}\text{Fe}_5$  Melt-Spun Ribbons", M. Rubinstein, V.G. Harris, B.N. Das, and N.C. Koon, Physical Review B.

"Magnetic Reconstruction of the Gd(0001) Surface", H. Tang, T.G. Walker, H. Hopster, and A.W. Pang, D. Weller, J.C. Scott, and C. Chappert, D.S. Dessau, D.P. Pappas, Physical Review Letters, 1993.

"Magnetic Shielding and Noise Spectrum Measurements of Y-Ba-Cu-O, Bi-Sr-Ca-Cu-O and (Bi, Pb)-Sr-Ca-Cu-O Superconducting Tubes", M.M. Miller, T. Carroll, R.J. Soulen Jr, L. Toth, and R. Rayne; N. McN. Alford and C.S. Sanders, Cryogenics 1993 Vol 33, No. 2, p 180.

"Magnetic Structure of Fe/Cr/Fe Trilayers", Y.U. Idzerda; L.H. Tjeng, H.-J. Lin, G. Meigs, and C.T. Chen, J. Gutierrez, J. Appl. Phys. 73 (10), 15 May 1993, pp 6204-6206.

"Magnetic Structure of Fe/Cr/Fe Trilayers", Y.U. Idzerda; L.H. Tjeng, and H.-J. Lin, C. Gutierrez, G. Meigs, and C.T. Chen, Physical Review B, Vol. 48, No. 6, 1 Aug 1993-II, pp. 4144-4147.

"Magnetic Structure of Fe/Cr/Fe Trilayers", Y.U. Idzerda; L.H. Tjeng, and H.-J. Lin, C. Gutierrez, G. Meigs, and C.T. Chen, Surface Science 287/288 (1993), pp. 741-746.

"Magnetic X-ray Dichroism in 2p Absorption Spectra of Fe/Cu(001)", G.D. Waddill, and J.G. Tobin, D.P. Pappas, J. Appl. Phys. 73 (10), 15 May 1993, p 6748.

"Magnetization and Transport Anomalies in Metal/Ferromagnetic Insulator Heterostructures", G.M. Roesler, M.E. Filipkowski, P.R. Broussard, M.S. Osofsky, and Y.U. Idzerda, Conference Proceedings, Journal of Applied Physics, 1993.\*

"Magneto-Elastic Behavior of NbSe<sub>3</sub>", R.L. Jacobsen, T.M. Tritt, A.C. Ehrlich, and D.J. Gillespie, Physical Review B., 1993.

"Mastering Chaos", W. Ditto, and L. Pecora, Scientific American, August 1993, p 78.

"Measurements of Hc<sub>2</sub>(T) in Bi-Sr-Cu-O", M. Osofsky, R. Soulen Jr., and S. Wolf; J. Broto, H. Rakoto, J. Ousset, G. Coffe, and S. Askenazy, P. Pari, I. Bozovic, J. Eckstein, and G. Virshup, Journal of Superconductivity.

"Mechanism for Non-Heisenberg-Exchange Coupling Between Ferromagnetic Layers", R.P. Erickson; K.B. Hathaway, and J.R. Cullen, Physical Review B, Vol. 47, No. 5, 1 February 1993-I, p. 2626.

"Microscopic Model for the Isotope Effect in the High T<sub>c</sub> Oxides", S.A. Wolf; V.Z. Kresin, Nature, 1993.

"Nanoparticles from a Supersaturated Vapor", A.S. Edelstein, Nanophase Materials, G.C. Hadjipanayis and R.W. Siegel (eds.), 1994 Kluwer Academic Publishers, NATO ASI Series, Series E: Applied Sciences, Vol. 260, pp. 73-80.

"Narrowing Sputtered Nanoparticle Size Distributions", F.H. Kaatz, G.M. Chow, and A.S. Edelstein, J. Mater. Res., Vol. 8, No. 5, May 1993, p. 995.

"NMR, Magnetism and Mossbauer Effect in Icosahedral Al<sub>63</sub>Cu<sub>24.5</sub>Fe<sub>12.5</sub> - A Thermodynamically Stable Quasi-periodic Alloy", A.R. Drews, M. Rubinstein, and G.H. Stauss; L.H. Bennett and L.J. Swarzendruber, JALCOM 419, Journal of Alloys and Compounds, 190 (1993), pp. 189-195.

"Observation of Long-Lived Exciton-Magnetic-Polarons in Zn<sub>1-x</sub>MnxSe/ZnSe Multiple Quantum Wells", C.D. Poweleit, and L.M. Smith, B.T. Jonker, Phys. Rev. Lett.

"On the Kinetics of Shrinking Grains", S.P. Marsh, M.A. Imam, B.B. Rath, and C.S. Pande, *Acta metall. mater.* Vol. 41, No. 1, 1993, pp. 297-304.

"Optical Study of Strained ZnSe/GaAs and ZnMnSe/GaAs Epilayers", W.C. Chou, A. Twardowski, K. Chern-Yu, F.R. Chen, and C.R. Hua, B.T. Jonker; W.Y. Yu, S.T. Lee, and A. Petrou, J. Warnock, *J. Appl. Phys.*

"Optical Transitions in Zn<sub>1-x</sub>CoxSe and Zn<sub>1-x</sub>FexSe: Strong Concentration-Dependent Effective p-d Exchange", C.-L. Mak, R. Sooryakumar and M.M. Steiner, B.T. Jonker *Physical Review B*, Vol. 48, No. 16, 15 October 1993-II, p.11 743.

"p-d Exchange and Optical Properties of the Diluted Magnetic Semiconductors (ZnCo)Se and (ZnFe)Se", C.-L. Mak, R. Sooryakumar, and M.M. Steiner; B.T. Jonker, *J. Appl. Phys.*

"Participation of Hydrogen in the Impact Behavior of 304L Stainless Steel", D.P. Harvey, II; J.B. Terrell, T.S. Sudarshan, M.R. Louthan, Jr (E.I. Dupont Nemours Inc), *Engineering Fracture Mechanics* Vol. 46, No. 3, 1993, pp. 455-464.

"Penetration Depth in Laser Beam Welding", E.A. Metzbower, *Welding Journal*, Vol. 72, No. 8, August 1993, pp. 403-s-407-s.

"Phase Development in Titanium Implanted and Heat Treated Silicon Carbide", R.G. Vardiman *Materials Science and Engineering*

"Pile-up Based Hall-Petch Relation for Nanoscale Materials", C.S. Pande, and R.A. Masumura; R.W. Armstrong, *NanoSTRUCTURED MATERIALS* Vol. 2, 1993, pp 323-331.

"Possible Expanation for the Shape of I-V Curves of Superconductors and a More Meaningful Definition of I<sub>c</sub>", R. Soulen, Jr., *IEEE Transactions on Applied Superconductivity*, Vol. 3, No. 1, March 1993, p.1261.

"Pressure Dependence of T<sub>c</sub> in NdBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub>  to 6 GPa", C.C. Kim, E.F. Skelton, and M.S. Osofsky; D.H. Liebenberg, *Physical Review B*, Vol. 48, No. 9, 1 September 1993-I, p. 6431.

"Pressure Dependence of the Superconducting Transition Temperature in Single Crystals of Tl<sub>2</sub>Ba<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>10-x</sub>", D.D. Berkley, E.F. Skelton, N.E. Moulton, M.S. Osofsky, W.T. Lechter, and V.M. Browning; D.H. Liebenberg, *Physical Review B*, Vol. 47, No. 9, 1 March 1993-I, p. 5524.

"Processing of PZT 4S Ceramics", M. Kahn; M. Chase (Potomac Research), *Journal of the American Ceramics Society*, 1993.

"Properties of Superconductor-Ferromagnet Bilayers: YBa<sub>2</sub>CuO<sub>3</sub>-Fe and YBa<sub>2</sub>CO<sub>3</sub>-Permalloy", M. Rubinstein, P. Lubitz, W.E. Carlos, P.R. Broussard, D.B. Chrisey, J. Horwitz, and J.J. Krebs, *Physical Review B* Vol. 47, No. 22, 1 June 1993-II, pp. 15 350-15 353.

"Quantum Size Effect and the Giant Magnetoresistance in Magnetic Multilayers", A.C. Ehrlich, and D.J. Gillespie, *J. Appl. Phys.* 73 (10), 15 May 1993, p. 5536.

"Real-Time Parallel Computation and Visualization of Ultrasonic Pulses in Solids Using the Connection Machine", R.S. Schechter, H.H. Chaskelis, and R.B. Mignogna; P.P. Delsanto, *Science*, 1993..

"Remarks on the Random Anisotropy Model: Monotonic Dependence of the Coercive Field on D/J", W.M. Saslow (Texas A&M Univ); N.C. Koon, Phys. Rev. B, 1993.

"Residual Stresses in Ceramic-Interlayer-Metal Joints", H. Yu, S.C. Sanday, and B.B. Rath, J. Am. Ceram. Soc. 76, pp 1661-1664.

"Shear Test and Shear Strength of Ceramic Composites", C.M. Wu, B.A. Bender, and T.L. Jessen, Ceramic Engineering and Science Proceedings, July - August 1993, The American Ceramic Society, p 198, 1993.\*

"Simple Apparatus for the Liquefaction of Neon Directly into a Research Dewar", T.L. Francavilla, R.J. Soulen Jr., and J.H. Claassen, Rev. Sci. Instrum. 64 (7), July 1993, pp 2023-2026.

"Simulation of Deep Penetration Welding of Stainless Steel Using Geometric Constraints Based on Experimental Information", S.G. Lambrakos, and E.A. Metzbower; J. Milewski, G. Lewis, R. Dixon, and D. Korzekwa, Journal of Materials Engineering and Performance, 1993.

"Nuclear Instruments and Methods", Y.U. Idzerda; C.T. Chen, H.-J. Lin, and G. Meigs,, G.H. Ho, C.-C. Kao, "Sol-Gel Deposited Alumina Films on Aluminum Nitride", A. Nazeri, and M. Kahn, Laboratory Report, American Ceramic Society Bulletin, Vol. 72, No. 1, January 1993, pp 59-65.

"Space Applications of High Temperature Superconductivity: The High Temperature Superconductivity Space Experiment (HTSSE)", M. Nisenoff, S.A. Wolf, J.C. Ritter, and G. Price Physica C 209 (1993) 263-268

"Space Applications of High Temperature Superconductivity: The High Temperature Superconductivity Space Experiment (HTSSE)", M. Nisenoff, J.C. Ritter, G. Price, and S.A. Wolf, FED Journal, Vol. 3, Suppl. 1, 1993, pp. 35-43.

Structure and Magnetism of Heat Treated Nanocrystalline Cu<sub>80</sub>Co<sub>20</sub> Powders Prepared Via Chemical Means, V.G. Harris, F.H. Kaatz, V. Browning, D.J. Gillespie, R.K. Everett, A.M. Ervin, W.T. Elam, and A.S. Edelstein, MMM Conf, 15-18 Nov 1993, Minneapolis, MN.

"Substrate Temperature Effect on the Structural Anisotropy in Amorphous Tb-Fe Films", V.G. Harris; F. Hellman, W.T. Elam, and N.C. Koon, J. Appl. Phys. 73 (10), 15 May 1993, p. 5785.

"Superconducting-State Thermal Transport in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub> ", J.L. Cohn, V.Z. Kresin, M.E. Reeves, and S.A. Wolf, Physical Review Letters, Vol. 71, No. 10, 6 September 1993, p. 1657.

"Superconductivity, Gapless State and Isotope Effect in the Cuprates", V.Z. Kresin, M.E. Reeves, and S.A. Wolf, Physica C 209 (1993) pp. 319-326.

"Surface Adatom-adatom Coordination and Orientation Determined by Low Energy Auger Electron and Photoelectron Diffraction due to Adomtom Emission", B.T. Jonker, Surface Science Letters.

"Surface Roughness and Long-Range Order of a Semi-Infinite Ferromagnet", R.P. Erickson, and J.R. Cullen, J. Appl. Phys. 73 (10), 15 May 1993, p. 5981.

"Symmetry of the Pairing State in the High T<sub>c</sub> Oxides", S.A. Wolf; V.Z. Kresin (Lawrence Berkeley Lab), Physica C.

"Symmetry of the Pairing, Isotope Effect and Mechanism of Superconductivity in the Cuprates", S.A. Wolf; V.Z. Kresin, SPIE, The International Society for Optical Engineering.

"Synchronization and Desynchronization in Pulse Coupled Relaxation Oscillators", T. Cdarroll, L. Pecora, J. Heagy, Physics Letter A.

"Synchronizing Chaos", T.L. Carroll, Science Today, published by the Brazilian Society for the Advancement of Science.

"Synchronizing Chaotic Systems Using Filtered Signals", T.L. Carroll, Physical Review E.

"Synchronizing Nonautonomous Chaotic Circuits", T.L. Carroll, and L.M. Pecora, IEEE Transactions on Circuits and Systems-II: Analog and Digital Signal Processing, Vol. 40, No. 10, October 1993, p. 646.

"Synchronous Chaos in Coupled Oscillator Systems", J.F. Heagy, T.L. Carroll, and L.M. Pecora, Physical Review E.

"Temperature Dependence of the 90° Coupling in Fe/Al/Fe(001) Magnetic Trilayers", M.E. Filipkowski, C.J. Gutierrez, J.J. Krebs, and G.A. Prinz, J. Appl. Phys. 73 (10), 15 May 1993, p. 5963.

"Thallium Cuprate Research by the U.S. Government", M.S. Davis, and S.A. Wolf, Thallium-Based High Temperature Superconductors, Edited by A.M. Hermann, and J.V. Yakhmi, Marcel Dekker, Inc., Chapter 29, p. 593.

"The Angular Dependence of the Critical Current Density of Textured YBaCuO", T. Francavilla, M. Miller, and R.J. Soulen, Jr; V. Selvamanickam, and K. Salama, IEEE Transactions on Applied Superconductivity, Vol. 3, No. 1, March 1993, p. 1487.

"Spin Coupled Resistance Observed in Ferromagnet-Superconductor-Ferromagnet Trilayers", M. Johnson, Applied Physics Letters.

"Spin Dependent Confinement in DMS-Based Heterostructures", A. Petrou, L.P. Fu, W.Y. Yu, and S.T. Lee, B.T. Jonker; J. Warnock, Journal Appl. Physics.

"Spin Lifetimes in Diluted Magnetic Semiconductor Spin Superlattices", B.T. Jonker; L.P. Fu, W.Y. Yu, W.C. Chou, and A. Petrou, J. Warnock, J. Appl. Phys. 73 (10), 15 May 1993, pp. 6051-6053.

"Stabilization of Aluminum and Magnesium Base Metallic Glasses by the Addition of Calcium", J.D. Ayers, H.N. Jones, and C.L. Vold, Scripta Metallurgica et Materialia, Vol. 29, 1993, pp, 205-209.

"Stochastic Resonance and Crises", T.L. Carroll, and L.M. Pecora, Physical Review Letters, Vol. 70, No. 5, 1 February 1993, p. 576.

"Stochastic Resonance as a Crisis in a Period Doubled Circuit", T.L. Carroll, and L.M. Pecora, Physical Review E, Vol. 47, No. 6, June 1993, pp. 3941-3949.

"Strain Effects on the Energy Bands of ZnSe Films Grown on GaAs Substrates by Spectroscopic Ellipsometry", R. Dahmani, and L. Salamanca-Riba, N.V. Nguyen and D. Chandler-Horowitz, B.T. Jonker, Applied Phys. Lett.

- "Strengthening Mechanisms and Deformation Characteristics of Wrought Aluminium Alloys", T.S. Srivatsan, T.S. Sudarshan, D.P. Harvey II, and E.J. Lavernia, Metals Materials and Processes, 1993, Vol. 4, No. 4, Meshap Science Publishers, Bombay, India, pp. 259-286.
- "Structural Evolution and Magneto-resistance Properties of Heat Treated Cu<sub>80</sub>Co<sub>15</sub>Fe<sub>5</sub> Ribbons", V.G. Harris, B.N. Das, M. Rubinstein, J.L. Goldberg, W.T. Elam, and N.C. Koon, IEEE Transactions on Magnetics, Vol. 29, No. 6, November 1993, pp. 2616-2618.
- "Structural Origin of Critical Current Density Dependence on Grain Boundary Misorientation in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>", C.S. Pande, and R.A. Masumura, Journal of Electronic Materials.
- "The Birth of Strange Nonchaotic Attractors", J.F. Heagy, S.M. Hammel, Physica D, 1993.
- "The Creep of Intermetallics and Their Composites", K. Sadananda, and C.R. Feng, Journal of Metals (JOM) Vol. 45, No. 5, May 1993, pp. 45-48.
- "The De Hass-Van Alphen Effect in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\Delta$</sub> ", E.G. Haanappel, W. Joss, and P. Wyder, S. Askenazy, F.M. Mueller, K. Trubenbach, Hj. Mattausch, and A. Simon (Max-Planck-Inst, Germany); M. Osofsky, Journal of the Physics and Chemistry Solids, 1993.
- "The Effect of Fiber Arrangement on the Mechanical Properties of a Unidirectional CFCC", T.L. Jessen, J. Powers, and B.A. Bender, Ceramic Engineering & Science Proceedings, September - October 1993, The American Ceramic Society, p. 991, 1993.\*
- "The Evolution and Growth Kinetics of Precipitate Plates Growing by the Ledge Mechanism", G. Spanos, R.A. Masumura, and R.A. Vandermeer; M. Enomoto, Acta Metallurgica et Materialia, 1993.
- "The Fine Structure and Formation Mechanism of Lower Bainite", G. Spanos, Metallurgical Transactions A., 1993.
- "The High Temperature Superconductivity Space Experiments HTSSE I - Components and HTSSE II - Subsystems and Advanced Devices", M. Nisenoff, J.C. Ritter, G. Price and S.A. Wolf, IEEE Transactions on Applied Superconductivity, Vol. 3, No. 1, March 1993, p 2885.
- "The Local Atomic Order of Cu and Fe in Heat Treated Fe<sub>73.5</sub>Nb<sub>3</sub>Cu<sub>1</sub>Si<sub>13.5</sub>B<sub>9</sub> Ribbons", J.D. Ayers, V.G. Harris, J.A. Sprague, and W.T. Elam, IEEE Transactions on Magnetics, Vol. 29, No. 6, November 1993, pp.2664-2666.
- "The Microstructural Evolution, Crystallography, and Thermal Processing of Ultrahigh Carbon Fe-1.85 pct C Melt-Spun Ribbon", G. Spanos, J.D. Ayers, and C.L. Vold; I.E. Locci (NASA Lewis Research Cntr), Metallurgical Transactions A, Vol. 24A, April 1993, p. 809.
- "The Pulsed High Magnetic Field Facility, Toulouse, France", R.J. Soulen, M.S. Osofsky, and S.A. Wolf, European Science Notes Information Bulletin (ESNIB) 93-02, Office of Naval Research, European Office, pp. 134-141.
- "Thermal Activation of Plastic Instabilities in Low-Carbon Steel", H.N. Jones, Scripta Metallurgica et Materialia, Vol. 28, 1993, pp 225-230.
- "Thermal Expansion of Chemical Vapor Deposition Grown Diamond Films", S.B. Qadri, C. Kim, E.F. Skelton, T. Hahn, and J.E. Butler, Thin Solid Films, 236 (1993), pp. 103-105.



“Thermal Stress Relaxation due to Plastic Flow in the Fiber Coating of a Continuous Fiber Reinforced Composite”, T.A. Hahn, Journal of Composite Materials, Vol. 27, No. 16 (1993) p 1545.

“Thermodynamic Determination of the Electron-phonon Coupling Strength in YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub>-”, M.E. Reeves, V.Z. Kresin, and S.A. Wolf, Proceedings of the Molecular Oxide Superconducting Conference, Journal of Superconductivity, 1993.\*

“Thickness Dependence of the Anisotropic Magnetoresistance in Epitaxial Iron Films”, M. Tondra, D.K. Lottis, K.T. Riggs, Y. Chen, and E.D. Dahlberg, G.A. Prinz, J. Appl. Phys. 73 (10), 15 May 1993, p. 6393.

“Thin-Film-Magnet Magneto-optic Waveguide Isolator”, M. Levy, I. Ilic, R. Scarmozzino, R.M. Osgood, Jr., R. Wolfe, C.J. Gutierrez, and G.A. Prinz, IEEE Photonics Technology Letters, Vol. 5, No. 2, February 1993, p. 198.

“Transverse Strengths and Failure Mechanisms in Ti<sub>3</sub>Al Matrix Composites”, D.B. Marshall, W.L. Morris, B.N. Cox, J. Graves and J.R. Porter, D. Kouris, R. Everett, Acta Metall.

“Two Critical Stress Intensities for Threshold Fatigue Crack Propagation”, A.K. Vasudevan, K. Sadananda; N. Louat, Scripta Metallurgica et Materialia, Vol. 28, 1993, pp. 65-70.

“Unified Theoretical Description of the Layered Doped High T<sub>c</sub> Superconductors”, S.A. Wolf; V.Z. Kresin (Lawrence Berkeley Lab), Physics Reports.

“Using Chaos to Keep Period Multiplied Systems in Phase”, T.L. Carroll, and L.M. Pecora, Physical Review E, Volume 48, Number 4, October 1993, pp. 2426-2436.

“Vibrating-Reed Dynamics in a Magnetic Field”, R.L. Jacobsen and A.C. Ehrlich, Phys. Rev. Letters

“YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-y</sub>/Y<sub>2</sub>BaCuO<sub>5</sub> Composites: Growth and Characterization”, P.R. Broussard, L.H. Allen, V.C. Cestone, and S.A. Wolf, J. Appl. Phys. 74 (1), 1 July 1993, pp.446-450.

“The Effect of Shape in the Three-Dimensional Ablative Rayleigh-Taylor Instability: I. Single Mode Perturbations”, J.P. Dahlburg, J.H. Gardner, G.D. Doolen, and S.W. Haan, Phys Fluids B, Vol. 5, 571 (1993).

“The Kelvin-Helmholtz Instability in Photospheric Flows: Effects on Coronal Heating and Structure”, J.T. Karpen, S.K. Antiochos, R.B. Dahlburg, and D.S. Spicer, Astrophys. J. 403, 769 (1993).

“Numerical Simulation of Magnetic Flux-Tube Reconnection”, R.B. Dahlburg and S.K. Antiochos, EOS, Trans. AGU 74, 243 (1993).

“Reconnection of Magnetic Flux-Tubes”, R.B. Dahlburg and S.K. Antiochos, Bull. Am. Astron. Soc. 25, 1199 (1993).

“Transition to Turbulence in Surges and Flaring Loops”, R.B. Dahlburg and J.T. Karpen, Mass Supply and Flows in the Solar Corona, Isola d-Elba, Italy, Sept 27-Oct 1, 1993.

“Elementary Flux-Tube Reconnection”, R.B. Dahlburg and S.K. Antiochos, EOS, Trans. AGU 74, 523 (1993).

"The Magnetic Field of Solar Prominences", S.K. Antiochos, R.B. Dahlburg, and J.A. Klimchuk, EOS, Trans. AGU 74, 242 (1993).

"The Structure of Solar Prominences", S.K. Antiochos, R.B. Dahlburg and J.A. Klimchuk, Bull. Am. Astron. Soc. 25, 1206 (1993).

"The Role of MHD Shear Layers in Solar Surges", J.T. Karpen and R.B. Dahlburg, Bull. Am. Astron. Soc. 25, 1212 (1993).

"The Role of MHD Shear Layers in Solar Surges", J.T. Karpen and R.B. Dahlburg, EOS, Trans. AGU 74, 523 (1993).

"Implementation of the Full 3D Fast3D (FCT) Code Including Complex Geometry on the Intel iPSC/860 Parallel Computer", T.R. Young, Jr., A.M. Landsberg, and J.P. Boris, "Proceedings from the High Performance Computing 1993: Grand Challenges in Computer Simulation, Society for Computer Simulation, San Diego, CA, pp. 143-148, 1993.\*

"Finite Element Solvers for Radar Cross Section (RCS) Calculations", C.R. DeVore, R. Lohner, and B. Petitjean, Proceedings, 2nd Int'l Conference on Numerical Methods for Maxwell Equations, Washington, DC, Oct 93.\*

"A Technique for Regularizing the Structure of the Monotonic Lagrangian Grid", R.S. Sinkovits, J.P. Boris and E.S. Oran, J. Comput. Phys. 108, 368 (1993).

"The Interaction of Shocks and Defects in Lennard-Jones Crystals", L. Phillips, R.S. Sinkovits, E. S. Oran and J. P. Boris, J. Phys.: Condens. Matter 5, 6357 (1993).

"Computer Modeling of the Optical Properties of Substitutional Chromium Impurities in Halide Elpasolites", A. M. Woods, R. S. Sinkovits, J. C. Charpie, W. L. Huang, R. H. Bartram and A. R. Rossi, J. Phys. Chem. Solids 54, 543 (1993).

"Compressibility, Exothermicity, and Three-Dimensionality in Spatially-Evolving Reactive Shear Flows", F.F. Grinstein and K. Kailasanath, Progress in Astronautics and Aeronautics 151, 413-436 (1993).

"Dynamics of Flames Near the Rich-Flammability Limit of Hydrogen-Air Mixtures", K. Kailasanath, G. Patnaik and K. Ganguly, Prog. Astro. Aero. 151, 247-262 (1993).

"Radical Addition to HNO. Ab Initio Reaction Path and Variational Transition State Theory Calculations for H + HNO -- H2NO and H + HNO -- HNOH", M. Page and M. R. Soto, Journal of Chemical Physics 99, 7709 (1993).

"Structure of Reaction Waves Behind Oblique Shock", Li C., Kailasanath K., and Oran E.S., AIAA Progress in Astronautics 153:231 (1993).

"Oblique Detonation Structures in Ram Accelerators", Li C., Kailasanath K. and Oran E.S., Modern Developments of Spectroscopy, Combustion, and Energy, Pergamon Press.

"Molecular Dynamics Simulations of Shock-Defect Interactions in Two-Dimensional Nonreactive Crystals", R. S. Sinkovits, L. Phillips, E. S. Oran and J. P. Boris, Mat. Res. Soc. Symp. Proc. 296, 161 (1993).

"Naval Ship Superstructure Design: Complex Three-Dimensional Flows Using an Efficient Parallel Method", A.M. Landsberg, J.P. Boris, W. Sandberg, and T.R. Young Jr., Proceedings

from High Performance Computing 1993: Grand Challenges in Computer Simulation, Society for Computer Simulation, San Diego, CA, pp. 15-20, 1993.\*

“Dynamics of Spatially Developing Reactive Square Jets”, F.F. Grinstein and K. Kailasanath, Proc. of the 9th Symposium on Turbulent Shear Flows, Kyoto, Japan (1993).\*

“Scalability Studies of an Unstructured Incompressible Flow Solver”, R. Ramamurti and R. Lohner, Proceeding of the Second Delta Applications Workshop, Norfolk, VA, March 1993.\*

“Simulation of Flow Past Complex Geometries Using a Parallel Implicit Incompressible Flow Solver”, Ramamurti and R. Lohner, AIAA CP-933, Proceedings of the 11th AIAA CFD Conference, Orlando, FL, July, 1993, pp. 1049-1050.\*

“Simulation of Complex Incompressible Flows Using a Finite Element Solver on MIMD Machine”, R. Ramamurti and R. Lohner, to appear in Parallel Computational Fluid Dynamics '93, Eds: A. Ecer (et. al), Elsevier Publications.

“Structure and Dynamics of Premixed Flames in Microgravity”, K. Kailasanath and G. Patnaik, pp. 171-176, Proceedings of the Second International Microgravity Combustion Workshop, NASA CP-10113, NASA, Washington, DC, February 1993.\*

“Numerical Simulations of the Extinguishment of Downward Propagating Flames”, G. Patnaik and K. Kailasanath, Proceedings of the 24th Symposium (International) on Combustion, pp. 189-195, The Combustion Institute, Pittsburgh, PA., 1993.\*

“Effects of Boundary Layers on Oblique-Detonation Structures”, Li C., Kailasanath K., and Oran E.S., AIAA-93-0450, 1993.

“Analysis of Transient Flows in Thermally Choked Ram Accelerators”, Li C., Kailasanath K., Oran E.S., Landsberg A.M., and Boris J.P., AIAA-93-2187, 1993.

“Numerical Simulations of Transient Flows in Ram Accelerators”, Li C., Kailasanath K., Oran E.S., Boris J.P., and Landsberg A.M., AIAA-93-1916, 1993.

“Molecular Dynamics Simulations of Shock-Defect Interactions in Two-Dimensional Nonreactive Crystals”, R. S. Sinkovits, L. Phillips, E. S. Oran, and J. P. Boris, Mat. Res. Soc. Symp. Proc. 296, 161 (1993).

“Simulation of Cellular Structure in a Detonation Wave”, M. H. Lefebvre, E.S. Oran, K. Kailasanath, and P.J. Van Tiggelen, Prog. Astro. Aero. 153, 64-77 (1993).

“Ignition in a Complex Mach Structure”, E.S. Oran, J.P. Boris, D.A. Jones, and M. Sichel, Prog. Astro. Aero. 153, 241-252 (1993).

“Computing Turbulent Shear Flows-A Convenient Conspiracy”, E.S. Oran and J.P. Boris. Computers in Physics, Sep/Oct 93.

“The Effect of Energy Release on a Supersonic Reactive Mixing Layer”, P. Vuillermoz, E.S. Oran and K. Kailasanath, Proceedings of the 24th Symposium (International) on Combustion, pp. 395-403, The Combustion Institute, Pittsburgh, PA., 1993.\*

“The Stability of Imploding Detonations”, E.S. Oran and C.R. DeVore, Proceedings, 19th Int'l Symposium on Shock Waves, Marseille, France, Jul 93.\*

- "Cryogenic Radiation Detectors", D. Welsh, T. Fausch, A. Drukier, R. Kroeger, S. Inderhees, S. King, Nuclear Instruments and Methods in Physics Research **B79**, 832-834 (1993).
- "Space Applications of High Temperature Superconductivity: The High Temperature Super-conductivity Space Experiment (HTSSE)", M. Nisenoff, S. Wolf, J. Ritter, G. Price, Physica C **209**, 263-268 (1993).
- "Space Application of High Temperature Superconductivity: The High Temperature Superconductivity Space Experiment (HTSSE)", M. Nisenoff, J. Ritter, G. Price, S. Wolf, FED Journal 3-1, 35-43 (1993).
- "Time Dependence of Radiation Induced Generation Currents in InGaAs Photodiodes", S. Messenger, G. Shaw, G. Summers, R. Walters, Journal of Applied Physics, 74, 3, August 1, 1993.
- "Damage Correlations in Semiconductors Exposed to Gamma, Electron and Proton Radiations", R. Walters, G. Summers, E. Burke, P. Shapiro, S. Messenger, IEEE Transactions on Nuc. Sci. NS-40, 1372 (1993).
- "Displacement Damage Effects in Mixed Particle Environment for Shielded Spacecraft CCDs", C. Dale, P. Marshall, B. Cummings, L. Shamey, A. Holland, IEEE Transactions on Nuc. Sci., NS-40, 1628 (1993).
- "Geometrical Factors in See Rate Calculations", E. Peterson, J. Pickel, E. Smith, P. Rudeck, J. Letaw, IEEE Transactions on Nuc. Sci. NS-40, 1888 (1993).
- "The Shape of Heavy Ion Upset Cross Section Curves", M. Xapsos, T. Weatherford, P. Shapiro, IEEE Transactions on Nuc. Sci., NS-40, 1812 (1993).
- "Low Temperature Proton Irradiation of GaAs MESFETS", G. Summers, G. Shaw, M. Xapsos, B. Weaver, IEEE Transactions on Nuc. Sci., NS-40, 1300 (1993).
- "SEU Rate Prediction and Measurement of GaAs SRAMs Onboard the CRRES Satellite", J. Langworthy, T. Weatherford, P. McDonald, A. Campbell, IEEE Transaction on Nuc. Sci. NS-40, 1463 (1993).
- "SEDS MIL-STD-1773 Fiber Optic Data Bus: Proton Irradiation Test Results and Spaceflight SEU Data", M. Gates, K. LaBe, J. Miller, E. Stassinopoulos, C. Crabtree, C. Dale, P. Marshall, IEEE Transactions on Nuc. Sci. NS-40, 1638 (1993).
- "Heavy Ion and Proton Analysis of a GaAs C-HIGFET SRAM", A. Peczalski, J. Cutchin, S. Hanka, E. Petersen, A. Campbell, P. Marshall, T. Weatherford, J. Langworthy, IEEE Transactions on Nuc. Sci., NS-40, 1660 (1993).
- "A Practical System Hardness Assurance Program", L. Henderson, L. Simpkins, A. Namenson, A. Campbell, A. Campbell, J. Ritter, E. Wolicki, IEEE Transactions on Nuc. Sci. NS-40, 1725 (1993).
- "Single Event Dynamics of High-performance HBTs and GaAs MESFETS", D. McMorrow, T. Weatherford, A. Knudson, L. Tran, J. Melinger, A. Campbell, IEEE Transactions on Nuc. Sci. NS-40, 1858 (1993).
- "Single Event Induced Charge Transport Modeling of GaAs MESFETS", D. McMorrow, T. Weatherford, W. Curtice, A. Knudson, A. Campbell, IEEE Transactions on Nuc. Sci. NS-40, 1867 (1993).
- "Practical Approach to Determining Charge Collection in Multi-Junction Structures Due to Ion Shunt Effects", A. Brown, S. Kerns, W. Stapor, B. Bhuvu, IEEE Transactions on Nuc. Sci., NS-40, 1918 (1993).

- "Numerical Simulation of Heavy Ion Charge Generation and Collection Dynamics", W. Stapor, J. Howard Jr., M. Pinto, R. Block, H. Dussault, IEEE Transactions on Nuc. Sci., NS-40, 1926 (1993).
- "Radiation-Induced Reverse Dark Currents in In<sub>0.53</sub>Ga<sub>0.47</sub>As Photodiodes", S. Messenger, G. Shaw, R. Walters, G. Summers, Journal of Applied Physics, 73 (11), 7244, 1 June 1993.
- "Optimizing the Radiation Resistance of InP Solar Cells: Effect of Dopant Density and Cell Thickness", JR. Walters, G. Keavney, P. Drevinski, Journal of Applied Physics, 73 (1), 60, 1 January 1993.
- "Evidence for Low Frequency ( $\approx 15 \text{ cm}^{-1}$ ) Collective Modes in Benzene and Pyridine Liquids", D. McMorrow, W. Lotshaw, Chem. Phys. Lett., 201, 369 (1993).
- "Aging in Wire Insulation Under Multifactor Stressing", A. Bruning, F. Campbell, IEEE Transaction on Electrical Insulation, 28, p. 729, (1993).
- "Optical Conductivity of Single Crystals of Ba<sub>1-x</sub>M<sub>x</sub>BiO<sub>3</sub> (M=K, Rb)", T. J. Wieting, S. Guha, V. Browning, D. Peebles, D. Chandler-Horowitz, M. Norton, Journal Superconductivity, Vol. 6, No. 5, pp. 339, (1993).
- "Surface Reconstruction of Platinum and Gold and the Embedded-Atom Model", M. Haftel, Phys. Rev. B 48, 2611 (1993).
- "A Practical System Hardness Assurance Program", L. Henderson, L. Simpkins, IEEE Trans. Nuc. Sci., NS-40, 1725, 1993).
- "Precise Nonvariational Calculation of the M. Haftel Two-Photon Annihilation Rate of the Positronium Negative Ion", R. Krivec, V. B. Mandelzweig, Phys. Rev. A 47, 911, (1993).
- "Construction of Crystalline lattice vectors in specified orientations for atomistic simulations", J. V. Lill, Computer Phys. Comm., 78 (1993).
- "One Hundred Percent Abrupt Failure Between Two Radiation Levels in Step-Stress Testing of Electronic Parts", A. Namenson, D. Myers, IEEE Trans., Nuc. Sci., NS-40, 1709, (1993).
- "The Local Order of Cu and Fe in Heat Treated Fe<sub>73.5</sub>Nb<sub>3</sub>Cu<sub>1</sub>Si<sub>13.5</sub>B<sub>9</sub> Ribbons", J.D. Ayers, V.G. Harris, J.A. Sprague, W.T. Elam, IEEE Trans. on Magnetics, 29, 2664-2666 (1993).
- "Observation of Giant Flux-Flow in Superconducting Yba<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> Films", H.A. Blackstead, D.B. Pulling, J.S. Horwitz, D.B. Chrisey, Solid State Communications, 88, 671-675, 1993.
- "Microwave Measurement of the Dielectric Constant of Sr<sub>0.5</sub>Ba<sub>0.5</sub>TiO<sub>3</sub> Ferroelectric Thin Films", J.M. Pond, D.B. Chrisey, J.S. Horwitz, R.E. Leuchtner, K.R. Carroll, K.S. Grabowski, Appl. Phys. Lett. 62, 1845-1847, (1993).
- "Pulsed Laser Deposition of Novel HTS Multilayers for Passive and Active Applications", J.S. Horwitz, J.M. Pond, D.B. Chrisey, K.R. Carroll, P. Lubitz, K.S. Grabowski, R.E. Leuchtner, C.A. Carosella, C.V. Vittoria, IEEE Trans. on Magnetics, 3, 1528-1531 (1993).
- C.M. Cotell "Pulsed Laser Deposition and Processing of Biocompatible Hydroxylapatite Thin Films", Appl. Surf. Sci., 69, pp. 40-148 (1993).

"Growth of Gallium Nitride Thin Films by Electron Cyclotron Resonance Microwave Plasma-Assisted Molecular Beam Epitaxy", C.R. Eddy, Jr., T.D. Moustakas, J. Scanlon, J. Appl. Phys., **73**, 448-455 (1993).

"ECR-RIE of Submicron Features in Mercury Cadmium Telluride Using CH<sub>4</sub>/H<sub>2</sub> Plasmas", C.R. Eddy, J. C.A. Hoffman, J.R. Meyer, E.A. Dobisz, Appl. Phys. Letters, **62**, 2362-2364 (1993).

"Electron Cyclotron Reactive Ion Etching of Fine Features of Hg<sub>x</sub>Cd<sub>1-x</sub>Te using CH<sub>4</sub>/H<sub>2</sub> Plasmas", C.R. Eddy, Jr., E.A. Dobisz, C.A. Hoffman, J.R. Meyer, J. Vac. Sci. & Techn., **A 11**, 1763-1767 (1993).

"Comparison of Co/H<sub>2</sub> and CH<sub>4</sub>+O<sub>2</sub>/H<sub>2</sub> Plasmas for Diamond Thin Film Deposition by ECR-PACVD", C.R. Eddy, Jr., D.L. Youchison, B.D. Sartwell, Diamond and Related Materials **3**, 105-111 (1993).

"Nanometer Fabrication in Mercury Cadmium Telluride by Electron Cyclotron Resonance Microwave Plasma Reactive Ion Etching", C.R. Eddy, Jr., C.A. Hoffman, J.R. Meyer, E.A. Dobisz, J. Electronic Materials, **22**, 1055-1060 (1993).

"Molecular Dynamics Simulation of Thin Film Growth on Ag (100) and (111) with Energetic Ag Atoms", C.M. Gilmore, J.A. Sprague, Nanostructured Materials **2**, 301-310 (1993).

"Magnetically Tunable Band-Pass Filter Utilizing Coplanar-Slotline Junction", D. Guan, C.A. Carosella, C. Vittoria, IEEE Trans. on Magnetics, **29/6**, 3252-3454 (1993).

"Surface Treatments with Ion Beam Assisted Deposition", Critical Reviews in Surface Chemistry, G.K. Hubler, **2(3)**, 169-198, (1993) (REVIEW).

"Vacuum Ultraviolet Spectroscopy Study of Excimer-Laser-Generated Plasmas", G. Mehlman, D.B. Chrisey, P.G. Burkhalter, J.S. Horwitz, D.A. Newman, J. Appl. Phys., **74**, 53-61, (1993).

"Enhancement of the Vacuum Ultraviolet Emission from Excimer Laser-Generated Plasmas by Ambient Gas Atoms", G. Mehlman, D.B. Chrisey, J.S. Horwitz, P.G. Burkhalter, R.C.Y. Auyeung, D.A. Newman, Appl. Phys. Lett., **63**, **18**, pp.2490-2492, (1993).

"Interface Sharpness During the Initial Stages of Growth of Thin Short Period III-V Superlattices", J.G. Pellegrino, S.B. Qadri, C.M. Cotell, P.M. Amirtharai, N.V. Nguyen, J. Comas, J. Vac. Sci. and Technol., **A11(4)**, 917-922 (1993).

"A Novel Microship Compatible Technique for Depositing YBCO on Both Surfaces of a Substrate", J.M. Pond, K.R. Carroll, D.B. Chrisey, J.S. Horwitz, V.C. Cestone, IEEE Trans. on Magnetics, **3**, 1711-1714 (1993)

"YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub> /LaAlO<sub>3</sub>/YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub>  Trilayer Transmission Lines for Measuring the Superconducting Penetration Depth", K.R. Carroll, J.S. Horwitz, J.M. Pond, D.B. Chrisey, IEEE Trans. on Magnetics, **3**, 1438-1441 (1993)

"Probing Thin Film YBCO Superconductors by Second Harmonic Generation with the Use of Femtosecond Lasers", J.K. Rice, S.W. McCauley, A.P. Baronavski, J.S. Horwitz, D.B. Chrisey, Phys. Rev. B, **47**, 6086-6094 (1993).

"Properties of Superconductor-Ferromagnet Bilayers:  $\text{YBa}_2\text{CuO}_3\text{-Fe}$  and  $\text{Yba}_2\text{CuO}_3\text{-Permalloy}$ ", M. Rubinstein, P. Lubitz, W.E. Carlos, P.E. Broussard, D.B. Chrisey, J.S. Horwitz, J.J. Krebs., Phys. Rev. B, 47,22, 350-352, (1993).

"Recent Advances in Ion Beam Modification of Metals", F.A. Smidt, G.K. Hubler, Nucl. Inst. Meth. Phys. Rev., B80/81, 207-216, (1993), (REVIEW).

"The Magnetic and Structural Properties of Pulsed Laser Deposited Epitaxial  $\text{Mn}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4$  Ferrite Films", C.M. Williams, D.B. Chrisey, P. Lubitz, K.S. Grabowski, J. Appl. Phys., 73, (Abstract) 6312 (1993).

"Characterization of ECR Plasmas Optimized for the Deposition of Diamond Thin Films", D.L. Youchison, C.R. Eddy, Jr., B.D. Sartwell, J. Vac. Sci. & Techn., A 11, 103-114 (1993).

"The Role of Oxygen in the Electron Cyclotron Resonance-Plasma Assisted Chemical Vapor Deposition of Diamond Films", J. Vac. Sci. & Techn., A 11, 1875-1880 (1993)

"Vibrational Analysis of Benitoite ( $\text{BaTiSi}_3\text{O}_9$ ) and the  $\text{Si}_3\text{O}_9$  Ring", C.C. Kim, M.I. Bell, D.A. McKeown, Phys. Rev., B 47, 7869 (1993).

"Raman Spectroscopy of Silicate Rings: Benitoite and the Three-Membered Ring", D.A. McKeown, M.I. Bell, C.C. Kim, Phys. Rev. B 48, 16357 (1993).

"K-Shell X-Ray Yield Scaling for Aluminum X-pinch Plasmas", D.H. Kalantar, D.A. Hammer, K.C. Mittal, N. Qi, F.C. Young, S.J. Stephanakis, P.G. Burkhalter, G. Mehlman, D.A. Newman, J. Appl. Phys. 73(12), 8134 (1993).

"VUV Spectroscopy Study of Excimer Laser-Generated Plasmas", D.B. Chrisey, G. Mehlman, P.G. Burkhalter, J.S. Horowitz, D.A. Newman, J. Appl. Phys. 74 (1).

"Enhancement of the Vacuum Ultraviolet Emission from Excimer Laser-generated Plasmas by Ambient Gas Atoms", D.A. Newman, G. Mehlman, R.C.Y. Auyeung, J.S. Horowitz, P.G. Burkhalter, D.B. Chrisey, Appl. Phys. Lett. 63 (18), 2490 (1993).

"Magnetic and Structural Studies of Epitaxial (001)Fe and (001)  $\text{Fe}_x\text{Co}_{1-x}$  Alloy Film Structures", W.T. Elam, C.J. Gutierrez, V.G. Harris, J.J. Krebs, G.A. Prinz, M.E. Filipkowsk, J. Magn. Mater., i 126, 232 (1993).

"Substrate Temperature Effect on Structural Anisotropy in Amorphous Tb-Fe Films", W.T. Elam, F. Hellman, N.C. Koon, J. Appl. Phys. 6763 (1993).

"Magnetic and Structural Characteristics of Epitaxial  $\text{Fe}_x\text{Co}_{1-x}$  Alloy Films on ZnSe(001)", G.A. Prinz, V.G. Harris, C. Gutierrez, J.J. Krebs, W.T. Elam, V.G. Harris, J. Appl. Phys. 73, 6763 (1993).

"Experimental Evidence of Two Species of Radiation Trapped Positive Charge", D.B. Brown, C.M. Dozier, R.K. Freitag, IEEE, T. Nucl. Sci. 40 (6), 1316 (1993).

"A Theory of the Mollwo-Ivey Law for Defect Absorption and its Correlation to the Stokes Shift in Emission", M.S. Malghani, D.Y. Smith, J. of Lumin. 56 (1), (1993)

"Photoelectron Spectroscopy of the Laser-Excited X Surface State on GaAs(110) using Synchrotron Radiation", S.S. Goldenberg, J.P. Long, M.N. Kabler, Phys. Rev. B 47 (4), 2402 (1993).

"Ionotropic Gelation in a Bicontinuous Cubic Phase", S. Puvvada, S.B. Qadri, B.R. Ratna, J. Phys. Chem.-US 97, 11103 (1993).

"Interface Roughness of Short-Period AlAs/GaAs Superlattices Spectroscopic Ellipsometry", Studied by J.G. Pellegrino, P.M. Amirtharaj, S.G. Seiler, S.B. Qadri, C.M. Cotell, N.V. Nguyen, J. Appl. Phys. 73 (11), 7739 (1993).

"e-Beam Deposition of ZrO<sub>2</sub>-SnO<sub>2</sub> Films", C. Kim, S.B. Qadri, M.Z. Harford, E.F. Skelton, P. Lubitz Thin Solid Films 236, 103 (1993).

"Thermal Expansion of Chemical Vapor Deposition Grown Diamond Films", S.B. Qadri C. Kim, E.F. Skelton, T. Hahn, J.E. Butler, Thin Solid Films 236, 103 (1993).

"Structural Characteristics of Electron Cyclotron Resonance-Chemical Vapor Deposition SiC Coatings", E.F. Skelton, S.B. Qadri, A.R. Shimkunas, J.E. Butler, Surf. Coat. Tech. 61, 346 (1993).

"Low-Radiation-Damage Multilayer Coatings for the Soft-X-Ray Region", W.R. Hunter, J.F. Seely, Appl. Optics 32 (25), 4846 (1993).

"Blaze Considerations for Multilayer Gratings-Some Comments", W.R. Hunter, J.F. Seely, Opt. Commun. 104, 139 (1993).

"Effect of Oxygen Atom Bombardment on the Reflectance of Silicon Carbide Mirrors in the Extreme Ultraviolet Region", K.F. Dymond, M. Corson, G.E. Holland, W.R. Hunter, J.F. Seely, R.P. McKoy, Appl. Optics 32 (10), 1805 (1993).

"Dual-Waveband Operation of a Multilayer-Coated Diffraction Grating in the Soft X-Ray Range at Near-Normal Incidence", J.F. Seely, W.R. Hunter, J.C. Rife, T.W. Barbee, M.P. Kowalski, Jr., G.E. Holland, C.N. Boyer, C.M. Brown, R.G. Cruddace, Appl. Optics 32 (13), 2422 (1993).

"On-Blaze Operation of a Mo/Si Multilayer-Coated, Concave Diffraction Grating in the Wavelength Region and Near Normal Incidence", J.F. Seely, M.P. Kowalski, W.R. Hunter, C.M. Brown, T.W. Barbee, Jr., G.E. Holland, C.N. Boyer, J.C. Rife, Appl. Optics 32 (25), 136-142-4890 (1993).

"Normal-Incidence Reflectance of W/B<sub>4</sub>C Multilayer Mirrors in the 34-50- Wavelength Region", G. Gutman, J. Wood, G.S. Herman, M.P. Kowalski, J.C. Rife, W.R. Hunter, J.F. Seely Appl. Optics 32 (19), 3541 (1993).

"Pressure Dependence of T<sub>c</sub> in NdBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> to 5 GPa", E.F. Skelton, C.C. Kim, M.S. Osofsky, Phys. Rev. B 48, 6431 (1993).

"Pressure Dependence of the Super-conducting Transition of Tl<sub>2</sub>Ba<sub>2</sub>Ca<sub>2</sub>Cu<sub>2</sub>O<sub>10-x</sub>", E.F. Skelton, N.E. Moulton, D.D. Berkley, M.S. Osofsky, W.T. Lechter, V.M. Browning, D.H. Liebenberg, Phys. Rev. B 47 (9), 5524 (1993).



"Percolation Effects & Oxygen Inhomogeneities in  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ ", M.S. Osofsky, R.J. Soulen, S.A. Wolf, J.L. Cohn, M.M. Miller, E.F. Skelton, T.A. Vanderah, Phys. Rev. B 45 (9), 4916 (1993).

"Thermal Conductivity in the ab-Plane of Untwinned  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ ", J.L. Cohn, E.F. Skelton, S.A. Wolf, J.Z. Liu, R.N. Shelton, Phys. Rev. B 45, (22), 13144 (1993).

"Synthesis and Study in 23 Metal-La-Cu-O Systems", A.W. Webb, E.F. Skelton, S.B. Qadri, E.R. Carpenter, Jr., J. Solid State Chem. 102, 519-533 (1993).

"Effect of High X-ray Fluxes on Laser-Plasma X-ray Spectrometers", J.S. Wark, Rev. Sci.Instrum. 64 (7), 1718 (1993).

"Thermal Conductivity and Localization in Glasses: Numerical Study of a Model of Amorphous Silicon," R.R. Whitlock, J.L. Feldman, P.B. Allen, F. Wooten, M.D. Kluge, Phys. Rev. B48, 12589, (1993).

"Thermal Conductivity of Disordered Harmonic Solids," J.L. Feldman, P.B. Allen, Phys. Rev. B48, 12581 (1993).

"Formation of a Coherent Heavy Electron State in the Anderson Lattice Model," P.G. McQueen, J.W. Serene, Phys. Rev. Lett. 71, 129 (1993).

"High-Resolution Measurements, Line Identification, and Spectral Modeling of  $\text{K}\alpha$  Transitions in  $\text{FeXVIII-XXV}$ ", D.W. Hess, V.L. Jacobs, K.W. Hill, T. Phillips, P. Beiersdorfer, M. Bitter, S. von Goeler, S.M. Kahn, The Astrophysical Journal 409, 846 (1993).

"BCC Cobalt: Metastable Phase or Forced Structure?", A.Y. Liu, D.J. Singh, J. Appl. Phys. 73, 6189 (1993).

"Elastic Instability of BCC Cobalt," A.Y. Liu, D.J. Singh, Phys. Rev. B 47, 8515 (1993).

"Pressure Dependence of the Elastic Moduli in Aluminum Rich Al-Li Compounds", M.J. Mehl, Phys. Rev. B47, 2493 (1993).

"Phase Stability of Wüstite at High Pressure from First Principles LAPW Calculations", D.G. Isaak, R.E. Cohen, M.J. Mehl, D.J. Singh Phys. Rev. B47, 7720 (1993).

"Properties of Ordered Intermetallic Alloys: First-Principles and Approximate Methods", M.J. Mehl, D.J. Singh, D.A. Papaconstantopoulos Mat. Sci. & Eng. A170, 49 (1993).

"Analytic Expressions of Band Structure Potentials and Transferability Studies", D.A. Papaconstantopoulos, M.A. Keegan, J. Skroch, Modelling Simul. Mater. Sci. Eng. 1, 307 (1993).

"Covalent Container Compound: Empty, Endo- and Exohedral  $\text{C}_{28}$  Complexes", N. Laouini, M.R. Pederson Phys. Rev. B48, 2733 (1993).

"Electronic Structure of Superconducting  $\text{Ba}_6\text{C}_{60}$ ", S.C. Erwin, M.R. Pederson, Phys. Rev. B47, 14657 (1993).

"Formation of Self-Arranging Mo Cubes", A.S. Edelstein, G.M. Chow, E.I. Altman, R.J. Colton, M.R. Pederson, M.J. Mehl, F.H. Kaatz, Solid State Commun. 86, 323 (1993).

- "Electronic Structure Investigations of Siloxenic Clusters and Films", M.R. Pederson, W.E. Pickett, S.C. Erwin, Phys. Rev. B 48, 17400 (1993).
- "First Principles Determination of the Interatomic Force-Constant Tensor of the Fullerene Molecule", A.A. Quong, M.R. Pederson, J.L. Feldman, Solid State Commun. 87, 535 (1993).
- "Electronic States of Group-IV Endohedral Atoms in C<sub>28</sub>", K.A. Jackson, E. Kaxiras, M.R. Pederson, Phys. Rev. B 48, 17556 (1993).
- W.E. Pickett "Variational Monte Carlo Study of the Partially Polarized Electron Gas", Phys. Rev. B 48, 14859, (1993).
- "Electron-Phonon Coupling in High Temperature Superconductors: The Connection to Superconducting Behavior", J.Q. Broughton, W.E. Pickett, H. Krakauer, R.E. Cohen, Applied Superconductivity, Vol. 1, Nos. 3-6, 251 (1993).
- "Large Calculated Electron-Phonon Interactions in La<sub>2-x</sub>M<sub>x</sub>CuO<sub>4</sub>", H. Krakauer, W.E. Pickett, R.E. Cohen, Phys. Rev. B 47, 1002 (1993).
- "Clues to the Fundamental Properties of High Temperature Superconductors", W.E. Pickett, J. Phys. Chem. Solids 54, 1115 (1993).
- "First-Principles Evaluation of Dynamical Response and Plasmon Dispersion in Metals", A.A. Quong, A.G. Equiluz, Phys. Rev. Lett. 70, 3955 (1993).
- "Comparison Between Phenomenological and Pseudopotential Force Constants for the Lattice Dynamics of Al", A.G. Equiluz, A.A. Quong, A. Franchini, G. Santoro, R.F. Wallis, A.A. Maradudin, V. Bortolani, Phys Rev B 48, 6043 (1993).
- "Theoretical Determination that Electrons are the Anions in Electrified: Cs+(15-crown-5)<sub>2</sub>e<sup>-</sup>", H. Krakauer, C. Haas, W.E. Pickett, D.J. Singh, NATURE, Vol. 365, 39 (1993).
- "Calculated Electric Field Gradients of Ferroelectric KNbO<sub>3</sub>", D.J. Singh, Solid State Commun. 88, 323 (1993).
- "Electronic Structure of HgBa<sub>2</sub>CuO<sub>4</sub>", D.J. Singh, Physica C 212, 228 (1993).
- "Electronic Structure of HgBa<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>8</sub>: The Role of Mercury", D.J. Singh, Phys Rev B 48, 3571 (1993)
- "Weighted Density Approximation Ground State Studies of Solids", D.J. Singh, Phys Rev B 48, 14099 (1993).
- "Bond Order Potentials: A Study of s- and sp- valent Systems", J. of Phys.: Condens. Matter P. Gumbsch, D.G. Pettifor\*P. Alinaghian, A.J. Skinner, 5, 5795 (1993).
- "Examination of the SEU Sensitivity of GaAs MESFETs via 2-D Computer Simulation and Picosecond Charge Collection Experiments", A. Knudson, W. Curtice, D. McMorrow, A. Campbell, T. Weatherford, Proceedings of the 1993 Reliability Symposium.\*

"Single-Event Upset Concerns in GaAs Digital Circuits", T. Weatherford, D. McMorrow, W. Curtice, A. Campbell, A. Knudson, GaAs Reliability Workshop Proceedings (1993).\*

"Characterization of Radiation Energy Events Using Strand Break Measurements in Plasmid Solution: Fission Neutron Effects", W. Blakely, A. Stankus, C. Kolanko, P. Shapiro, M. Xapsos, Proceedings of the Sixth Annual Meeting of the Oxygen Club of Greater Washington, Bethesda, MD, 3 May 1993.\*

"Extreme Value Theory Applications to Space Radiation Damage Assessment in Satellite Microelectronics", E. Burke, C. Dale, P. Marshall, 1993 Proceedings of the NIST Conference on Extreme Value Theory and its Applications, 2-7 May 1993. This paper was also refereed.\*

"Current Research Efforts in Biological Dosimetry: Poly-merase Chain Reaction-Based Synthesis of a Human Centro-meric Hybridization Probe", M. Xapsos, W. Blakely, A. Stankus, M. Summer, C. Kolanko, Nato Panel 8/RSG-23 Conference Proceedings, Bethesda, MD, April (1993).\*

"A General Method for Predicting Radiation Damage to Solar Cells in the Space Environment", S. Messenger, E. Burke, R. Walters, R. Walters, G. Summers, P. Shapiro, R. Statler, G. Shaw Proceedings of the 23rd IEEE Photovoltaic Specialist Conference, 10-14 May 1993.\*

"One MeV Electron Irradiation of Monolithic Two-Terminal InP/InGaAs Tandem Solar Cells", S. Messenger, R. Walters, M. Wanlass, G. Summers, S. Messenger, E. Burke, R. Walters, R. Walters, G. Summers, P. Shapiro, R. Statler, G. Shaw, Proceedings of the 23rd IEEE Photovoltaic Specialist Conference, 10-14 May 1993.\*

"Microelectronics and Photonics Test Bed (MPTB)", J. Ritter, 1993 SPIE Proceedings, Vol. 1531, 13 April 1993.\*

"Candidate NRL Space Experiments for the Microelectronics and Photonics Test Bed (MPTB)", C. Dale, P. Marshall, 1993 SPIE Proceedings, Vol. 1531, p. 17-22 (1993).\*

"Proton Irradiation SEU Test Results for the SEDS MIL-STD-1773 Fiber Optic Databus: Integrated Optoelectronics", C. Crabtree, C. Stauffer, P. Marshall, E. Petersen, K. LaBel, C. Dale, E. Stassinopoulos, 1993 SPIE Proceedings, Vol. 1531, p. 27-36 (1993).\*

"Physical Interactions between Charged Particles and Optoelectronic Devices and the Effects on Fiber Based Data Links", E. Peterson, C. Dale, P. Marshall, J. Bristow, K. LaBel, E. Stassinopoulos, 1993 SPIE Proceedings, Vol. 1531, p. 104-115 (1993).\*

"Results from the CRRES MEP Experiment", A. Campbell, P. McDonald, R. Gonyea, M. Reeves, RADECS Conference Proceedings, 13-16 September 1993.\*

"The Effects of Base Dopant Level and Thickness on the Radiation Response of Ga<sub>0.47</sub>In<sub>0.53</sub>As Solar Cells", R. Walters, G. Shaw, G. Summers, S. Messenger, Proceedings of the IEEE 5th International Conference on InP and Related Materials, Paris, France, 18-22 April 1993.\*

"A Review of Space Radiation Effects for Fiber Optic Data Links", C. Dale, K. LaBel, E. Freible, P. Marshall, Proceedings of the SPIE Critical Review of Optical Science and Technology, Boston, MA, September 1993. This is an invited paper.\*

"Radiation Hardness Assurance Characterization Testing of InGaAsP Fiber Optic Transmitter and Receiver Modules", C. Dale, D. Meschel, P. Marshall, G. Lum, IEEE NSREC Workshop Proceedings, July 1993.\*

"Early Homoepitaxy of Au and Pt (100) with Surface Embedded Atom Potentials", M. I. Haftel, M. Rosen, Mat. Res. Soc. Symp. Proceedings, Vol. 280, pp. 69-72, (1993).\*

"Phase Composition and Microstructure as a Function of Deposition Conditions for Potassium Tantalate Niobate Thin Films Grown by Pulsed Laser Deposition", C.M. Cotell, R.E. Leuchtner, Mat. Res. Soc. Symp. Proc., 285, 367-372, (1993).

"Vacuum Ultraviolet Spectroscopy Study of Excimer Laser-Generated Plasmas: Spatial Distribution of Plasma", D.B. Chrisey, G. Mehlman, J.S. Horwitz, P.G. Burkhalter, D.A. Newman, R.E. Leuchtner, Mat. Res. Soc. Symp. Proc., 285, 33-38 (1993).

"Diamond Deposition from ECR-Generated Plasmas", C.R. Eddy, Jr., D.L. Youchison, B.D. Sartwell, in Proceedings of the 3rd International Symposium on Diamond Materials, J.P. Dismukes, ed., Electrochemical Society, 498-504 (1993).\*

"Characterization of Laser-Assisted Pulsed Laser Deposited BaFe<sub>12</sub>O<sub>19</sub>", J.S. Horwitz, D.B. Chrisey, K.S. Grabowski, C.A. Carosella, P. Lubitz, C. Edmondson, Mat. Res. Soc. Symp. Proc., 285, 391-395, (1993).

"Dynamics of Laser Ablation and Vaporization of Lead Zirconate Titanate: Target Effects", R.E. Leuchtner, J.S. Horwitz, D.B. Chrisey, Mat. Res. Soc. Symp. Proc., 285, 87-92 (1993).

"The Use of Ion Beam Assisted Deposition to Improve the Pitting Resistance of Aluminum", P.M. Natishan, E. McCafferty, E.P. Donovan, G.K. Hubler, Proceedings of the International Symposium on Light Metals 32nd Annual Conference of Metallurgists, The Metallurgical Society of CIM, Corrosion Science, 35, 125-131 (1993).\*

"Surface Modification of Aluminum by High Energy Ion Beams", E. McCafferty, P.M. Natishan, G.K. Hubler, Electrochem. Society Interface, 2/3, 45-49 (REVIEW) 1993.

"Normal Coordinate Analysis of Benitoite (BaTiSi<sub>3</sub>O<sub>9</sub>) and its Constituent Ring", D.A. McKeown, C.C. Kim, M.I. Bell, Mat. Res. Soc. Proc. 291, 515 (1993).

"Vacuum Ultraviolet Spectroscopy Study of Excimer Laser-Generated Plasmas: Spatial Distribution of Plasma", D.A. Newman, R.E. Leuchtner, D.B. Chrisey, G. Mehlman, J.S. Horowitz, P.G. Burkhalter, Mat. Res. Soc. Proc. 285, 33 (1993).

"Characterization of Capillary-Optic Materials for Use in X-Ray Lithography", H.B. Rosenstock, C.M. Dozier, D.A. Newman, M.I. Bell, R.K. Freitag, D.B. Brown, Mat. Res. Soc. Proc. 36, 169 (1993).

"Correlation of Magnetic and Structural phous Tb-Fe Films Via EXAFS", N.C. Koon, V.G. Harris, W.T. Elam, J. Magn. Soc. Jpn., 17, 267 (1993).

"Structural Origins of Perpendicular Magnetic Anisotropy in Amorphous Non-S-State Rare Earth-Transition Metal Alloy Films", "High Density Digital Recording", V.G. Harris, W.T. Elam, N.C. Koon, (NATO ASI Series E, Applied Sciences, Vol. 229), K.H.J. Buschow, G.J. Long and F. Grandjean (Editors), (Kluwer Academic Publishers), 483-517 (1993).

"A Structural Investigation of a Plasma Sprayed Ni-Cr Based Alloy Coating", S. Sampath, R.A. Neiser, H. Herman, J.P. Kirkland, W.T. Elam, J. Mater. Res. 8 (1), (1993).

"Double Crystal X-Ray Topography Characterization of an Electrical Bias "Induced Stress Variation in nMOSFETs", S.B. Qadri, D.I. Ma, D. McCarthy, M.C. Peckerar, Phys. of Semiconductor Devices, 256 (1993).

"Synchrotron X-Ray Diffraction from Nanocrystalline Semiconductors Under Pressure", S.B. Qadri, E.F. Skelton, Phys. of Semiconductor Devices, 613 (1993).

"Thermal Expansion of CVD - Grown Diamond Films", T. Hahn, J.E. Butler, W. Banholzer, S.B. Qadri, C. Kim, E.F. Skelton, Proc. Intl. Conf. on Metall. Coatings and Thin Films (1993).

"X-ray Diffraction Analysis of Ti-diffused Single-Crystal LiNbO<sub>3</sub>", P. Skeath, S.B. Qadri, F.A. Stevie, J. of Alloys and Compounds 191, 15 (1993).

"Optical Materials--UV, VUV", J.C. Rife, (M.N. Ediger, R.W. Waynant, (Editors)), Chapter 10 Electro-Optics Handbook, , 10.1 (1993).

"Effects of Pressure on Thallium-Based Superconductors", N.E. Moulton, E.F. Skelton, Chapter 21 Thallium-Based High-Temperature Superconductors, A.M. Hermann and J.V. Yakhmi (Editors), 433 (1993).

"Effects of Oxygen Inhomogenities on the Properties of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7- $\delta$</sub>  Crystals", S.A. Wolf, M.S. Osofsky, J.L. Cohn, E.F. Skelton, M.M. Miller, R.J. Soulen, Jr., Mat. Sci. Forum 137-139, 229 (1993).

"Chapter - "Heavy Fermion Phenomena", D.W. Hess, P.S. Riseborough, J.L. Smith, Encyclopedia of Applied Physics, Vol. 7, 437, VCH Publishing (1993).

"Nonlinear Molecular Dynamics and Monte Carlo Simulations of Crystals at Constant Temperature and Tensorial Pressure", J.V. Lill, Mat. Res. Soc. Symp. Proc. 291, 597 (1993).\*

"Transferable Total Energy Parametrization for Metals", M. Sigalas, D.A. Papaconstantopoulos, Mat. Res. Soc. Symp. Proc. 291, 27, (1993).

"A Method for the Determination of Real-Space Interatomic Force-Constants", B.M. Klein, A.A. Quong, A.Y. Liu, Mat. Res. Soc. Symp. Proc. 291, 43 (1993).\*

"Nonlinear Wave-Wave and Wave-Particle Interactions in Space Plasma", O.P. Sharma and V.L. Patel, Nonlinear Space Plasma Physics, R.Z. Sagdeev ed. p. 361, 1993.

"Mesoscale Plasma Transport in the Presence of a V-Shaped Potential Structure", S.B. Ganguli, H.G. Mitchell, and P.J. Palmadesso, Advances in Space Research Proceedings of the 1992 COSPAR General Assembly, 1993.\*

"Scaling and Simulation of Blast Waves Including the Effects of Shock Front Instabilities", I. Kohlberg, B. H. Ripin and J. Grun, Proc. 19th Int'l Conf. on Shock Waves, 1993.\*

"Experimental Studies of Very-High Mach Number Hydrodynamics", J. Grun, C. K. Manka, B. H. Ripin, A. C. Buckingham, and I. Kohlberg, Proc. 19th Int'l Conf. on Shock Waves, 1993.\*

"X-ray Emission from an Intense Ultra-Short Pulse Laser Aluminum Target Interaction", R. W. Clark, J. Davis, and J. L. Giuliani, Jr., Proceedings of the SPIE Conference on Particle Optics and X-ray Sources, 1993.\*

"Radiation Hydrodynamics of Gas Puff Z-Pinch Plasmas", J. Davis, J.L. Giuliani, Jr., M. Mulbrandon, and F.L. Cochran, AIP Conference Proceedings of the 3<sup>rd</sup> International Conference on Dense Z-Pinches, Ed., 1993.\*

"Phenomenological Modeling of Argon Z-Pinch Implosions", K.G. Whitney, J.W. Thornhill, C. Deeney, P.D. LePell, and M.C. Coulter, Proceedings of the 9th International Conference on High-Power Particle Beams, 3, p. 2044, 1993.\*

"Radiation Hydrodynamics of an Imploding Argon Puff Gas Plasma", J. Davis and F.L. Cochran, Proceedings of the 9th International Conference on High-Power Particle Beams, 3, p. 2050, 1993.\*

"A Review of Z-Pinch Research at Physics International", C. Deeney, P. D. LePell, T. Nash, B. Failor, S.L. Wong, R.R. Prasad, M. Krishnan, K.G. Whitney, W. Thornhill, F.L. Cochran, M.C. Coulter, J. Giulilani, J.P. Apruzese, F.C. Young, D. Hinshelwood, and J.D. Sethian, Proceedings of the 9th International Conference on High-Power Particle Beams, 1, p. 159, 1993.\*

"Radiative Z-Pinch Coupling to an Inductive Generator", J.L. Giuliani, Jr., M. Mulbrandon, R. Terry, P.F. Ottinger, R.J. Comisso, C. Deeney, and P.D. LePell, Proceedings of the 9th International Conference on High-Power Particle Beams, 1, p. 167, 1993.\*

"High Power Relativistic Klystron Amplifier Research at the Naval Research Laboratory", M. Friedman and V. Serlin, Proceedings of SPIE, ed. Howard E. Brandt, 1872, 2, 1993.\*

"The Two-Beam Configuration of the Relativistic Klystron Amplifier", V. Serlin and M. Friedman, Proceedings of SPIE, ed. Howard E. Brandt, 1872, 96, 1993.\*

"RF Convertor Simulation - Imposition of the Radiation Condition", D.G. Colombant, Y.Y. Lau, M. Friedman, J. Krall and V. Serlin, International Journal of Infrared and Millimeter Waves, 14, 335, 1993.

"External Modulation of Intense Relativistic Electron Beams with Spatial and Velocity Inhomogeneities", V. Serlin and M. Friedman, Applied Physics Letters, 62, 2772, 1993.

"The Nike KRF Laser Program", J.D. Sethian, S.E. Bodner, K.A. Gerber, R.H. Lehmberg, E.A. McLean, S.P. Obenschain, C.J. Pawley, M.S. Pronko, J.A. Stamper, A.V. Deniz, J. Hardgrove, T. Lehecka and M.W. McGeoch, Presented on the Eleventh International Conference on Laser Interaction and Related Plasma Phenomena, 1993.

"The Nike 60 cm Electron Beam-Pumped KrF Amplifier", J.D. Sethian, S.P. Obenschain, C.J. Pawley, I.D. Smith, P.A. Corcoran, R. Altes and M. McGeoch, Proceedings of the Ninth IEEE Pulsed Power Conference, 1993.\*

"ZFX - A 330 kJ, 1 MV, Pulsed Power Driver Using a Parallel Plate Water Capacitor", J.D. Sethian, J.R. Boller, R.J. Comisso, J.C. Kellogg, B.V. Weber and F.C. Young, Proceedings of The Ninth IEEE Pulsed Power Conference, 1993.\*

"Effects of Random Phase Distortion and Nonlinear Optical Processes on Laser Beam Uniformity with Induced Spatial Incoherence (ISI)", R.H. Lehmberg, S.P. Obenschain, C.J. Pawley and M.S. Pronko, Proceedings of SPIE 1870, 163, 1993.\*

"Simulating High-Intensity Charged Particle Beams for the Design of High-power Accelerators", W. Herrmannsfeldt, K. Ko, C. Ng, Irving Haber, A. Friedman and D. Grote, Computing at the Leading Edge - Research in the Energy Sciences, Arthur A. Mirin, ed, UCRL-TB-111084, 1993.

"Nonlinear Dynamics of Charged Particles in Field-reversed Current Sheets", J. Chen, Research Trends in Physics: Nonlinear Space Plasma Physics, R.Z. Sagdeev, ed., p. 27, 1993.

"Theoretical Interpretation of the Optical Observations from the CRRES Chemical Releases", P.A. Bernhardt and J.D. Huba, Proc. 19th Annual European Mtg. on Atmospheric Studies by Optical Methods, IRF Scientific Rpt. 209, p. 298, 1993.\*

"A Review of Airglow Excitation by High Power Radio Waves in the Ionosphere", Proc. 19th Annual European Mtg. on Atmospheric Studies by Optical Methods, IRF Scientific Rpt. 209, p. 274, 1993.

"Chaotic Frequency Modulation", P.A. Bernhardt, Proc. SPIE Program on Exploint Chaos and Nonlinearities, p. 162, 1993.\*

"Equilibrium Properties and Stability of a Negative Ion Cloud in the Ionosphere", G. Ganguli Proc. Fifth Workshop on the Physics of Dusty Plasmas, p. 1, 1993.\*

"Numerical Simulations of Optical Guiding of Laser Pulses in a Plasma", J. Krall, G. Joyce, P. Sprangle and E. Esarey, AIP Conf. Proc. 279, p. 528, 1993.\*

"Numerical Simulation of a 450 MeV Single-stage Laser Wakefield Accelerator", J. Krall, A. Ting, P. Sprangle, E. Esarey and G. Joyce, AIP Conf. Proc. 279, p. 514, 1993.

"Self-modulated-laser Wakefield Acceleration", J. Krall, A. Ting, E. Esarey and P. Sprangle Proc. 1993 Particle Accel. Conf., p. 2629, 1993.\*

"Numerical Simulations of Density Channel Guiding and Relativistic Optical Guiding of Laser Pulses in a Plasma", J. Krall, G. Joyce, P. Sprangle and E. Esarey, Proc. 9th Intl. Conf. on High Power Particle Beams, p. 1813, 1993.\*

"The NRL 11.4 GHz Magnicon Amplifier Experiments", S.H. Gold, C.A. Sullivan, B. Hafizi, W.M. Manheimer and W. M. Black, Proceedings of Ninth International Conference on High-Power Particle Beam, p. 1479, 1993.\*

"Second Harmonic Magnicon Amplifier Experiment at 11.4 Ghz", S.H. Gold, B. Hafizi, C.A. Sullivan and W. M. Manheimer, Proceedings of the Third International Workshop on Advanced Accelerator Concepts, AIP Conf. Proc. 279, p. 67, 1993.\*

"The NRL X-Band Magnicon Amplifier Experiment", S.H. Gold, G.A. Sullivan, W. M. Manheimer and B. Hafizi, 1993 Particle Accelerator Conference, 4, p. 2644, 1993.

"Theoretical Investigation of Magnicon Efficiency", B. Hafizi, S.H. Gold, W.M. Manheimer and P. Sprangle, 1993 Particle Accelerator Conference, 4, p. 2647, 1993.

"Space Plasma Physics in the Laboratory", B. H. Ripin, J. Grun, C. R. Manka, J. Resnick, and H. R. Burris, Research Trends in Physics: Nonlinear Space Plasma Physics, R. Z. Sagdeev, ed., p. 449, 1993.

"Inertial Confinement Fusion", B. H. Ripin, Encyclopedia of Applied Physics, G. Trigg, ed., vol. 6, p. 545, 1993.

"Plasma Dynamics Driven by Finite-Widt", S.B. Ganguli, H.G. Mitchell, and P.J. Palmadesso Geophysical Research Letters, 20, 975, 1993.

"Recurring Anti-Phase Signals in Coupled Nonlinear Oscillators: Chaotic or Random Time Series?", K.Y. Tsang and I.B. Schwartz, International Journal of Bifurcation and Chaos, 3, 773, 1993.

"Stochastic Tracking in Nonlinear Dynamical Systems", I. Triandaf and I.B. Schwartz, Physical Review E, 48, 486, 1993.

"Sub-Alfvenic Plasma Expansion", B. H. Ripin, J. D. Huba, E. A. McLean, C. K. Manka, T. Peyser, H. R. Burris, and J. Grun, Physics of Fluids B, 10, 1391, 1993.

"X-ray Damage Testing to Optical Components Using a Laser-Plasma Source", R. C. Elton, J. Grun, D. M. Billings, F. C. Young, C. K. Manka, B. H. Ripin, H. R. Burris, J. Resnick, D. J. Ripin, and J. R. Millard, Journal of Applied Physics, 74, 5432, 1993.

"Study of Gain in C-Band Deflection Cavities for a Frequency-Doubling Magnicon Amplifier", S.H. Gold, C.A. Sullivan, B. Hafizi and W.M. Manheimer, IEEE Transactions on Plasma Science, 21, 4, 383, 1993.

"New Results and Applications for the Quasioptical Gyrotron", A.W. Fliflet, R.P. Fischer, and W. M. Manheimer, Physics of Fluids B, 5, 2682, 1993.

"Nonlinear Analysis of a Magnicon Output Cavity", B. Hafizi, S.H. Gold, W.M. Manheimer, and P. Sprangle, Physics of Fluids B, 5, 3045, 1993.

"Viscoresistive stabilization of the Z pinch", F.L. Cochran and A.E. Robson, Physics of Fluids B, 5, 2905, 1993.

"Escape Time of Heliumlike Alpha Resonance-line Photons Emitted from Optically Thick Plasmas", J.P. Apruzese, Physical Review E, 47, 2798, 1993

"Modeling the Coaxial Double Z-pinch for the A1 XI-Mg IX Laser at 228", A.N. Qi, D.A. Hammer, and J.P. Apruzese, Journal of Applied Physics 74, 4303, 1993.

"Plasma Conditions for non-Maxwellian Electron Distributions in High Current Discharges and Laser-Produced Plasmas", K.G. Whitney and P.E. Pulsifer, Physical Review E, 47, 1968, 1993.

"Argon Gas Puff Implosion Experiments and Two-Dimensional Modeling", C. Deeney, P.D. LePell, F.L. Cochran, M.C. Coulter, K.G. Whitney, and J. Davis, Physics of Fluids B, 5, 992, 1993.

"Anomalous Resistivity in a Z-Pinch System", P.E. Pulsifer and K.G. Whitney, Proceedings of the 9th International Conference on High-Power Particle Beams, 3, p. 2056, 1993.\*

"Thermal Filamentation in Plasmas with Nonlocal Thermal Conductivity", A. J. Schmitt Physics of Fluids B, 5, 932, 1993.

"Induced Spatial Coherence Effects on the Convective Raman Instability", P.N. Guzdar, C.S. Liu and R.H. Lehmberg, Physics of Fluids B, 5, 910, 1993.



"System Study for Decade Using Inductive Storage Technology", P.F. Ottinger, D.V. Rose, J.M. Neri, and R.J. Commisso, Journal of Radiation Effects, Research and Engineering, 11, 143, 1993.

"Power Flow in Inductive Storage Systems with Radiating Plasma Loads", D. Mosher and R.J. Commisso, Journal of Radiation Effects, Research & Engineering, 11, 113, 1993.

"Intense Ion Beam Transport Experiments Using a Z-Discharge Plasma Channel", J.M. Neri, P.F. Ottinger, D.V. Rose, P.J. Goodrich, D.D. Hinshelwood, D. Mosher, S.J. Stephanakis and F.C. Young, Physics of Fluids B, 5, 176, 1993.

"Current Neutralization of Intense MeV Proton Beams Transported in Low-Pressure Gas", F.C. Young, D.D. Hinshelwood, R.F. Hubbard, M. Lampe, J.M. Neri, C.L. Olson, P.F. Ottinger, D.V. Rose, S.P. Slinker, S.J. Stephanakis, and D.R. Welch, Physical Review Letters, 70, 2573, 1993.

"Charged Particle Flow in Plasma-Filled Pinched-Electron-Beam Diodes", S.B. Swanekamp, S.J. Stephanakis, J.M. Grossmann, B.V. Weber, J.C. Kellogg, P.F. Ottinger, and G. Cooperstein, Journal of Applied Physics, 74, 2274, 1993.

"Density Measurements of a Neon Z-Pinch Plasma", B.L. Welch, H.R. Griem, and F.C. Young Journal of Applied Physics, 73, 3163, 1993.

"Temperature Measurements of a Neon Z-Pinch Plasma", B.L. Welch, F.C. Young, and H.R. Griem, Journal of Applied Physics, 74, 2260, 1993.

"X-ray Damage Testing of Optical Components. Using a Laser-Plasma Source", R.C. Elton, D.-M. Billings, J. Grun, F.C. Young, C.K. Manka, B.H. Ripin, H.R. Burris, J. Resnick, D.J. Ripin and J.R. Millard, Journal of Applied Physics, 4, 5432, 1993.

"Physics of Gas Breakdown for Ion Beam Transport in Gas", C.L. Olson, D.D. Hinshelwood, R.F. Hubbard, M. Lampe, J.M. Neri, P.F. Ottinger, J.W. Poukey, D.V. Rose, S.P. Slinker, S.J. Stephanakis, D.R. Welch, and F.C. Young, Nuovo Cimento, 106A, 1705, 1993.

"K-Shell X-Ray Yield Scaling for Aluminum X-Pinch Plasmas", D.H. Kalantar, D.A. Hammer, K.C. Mittal, N. Qi, F.C. Young, S.J. Stephanakis, P.G. Burkhalter, G. Mehlman, and D.A. Newman, Journal of Applied Physics, 73, 8134, 1993

"Plasma Irregularities Caused by Cyclotron Bunching of the CRRES G-2 Barium Release", P.A. Bernhardt and J.D. Huba, Journal of Geophysical Research, 98, 1613, 1993.

"Analysis of Rocket Transmissions to Reconstruct Ionospheric Densities", P.A. Bernhardt and J.D. Huba, et al., Radio Science, 28, 613, 1993.

"Modelling the Plasma Dynamics of the CRRES G-9 and G-10 Barium Releases", J.D. Huba, P.A. Bernhardt, J.A. Fedder, J.G. Lyon and H.G. Mitchell, Advanced Space Research, 13, 45, 1993.

"Equilibrium Morphology of Slender Untwisted Flux Loops", D. Garren, J. Chen and P. Cargill, Astrophysical Journal, 418, 919, 1993.

"Physics of the Magnetotail Current Sheet", James Chen, Physics of Fluids B, 5, 2663, 1993.

- "Self-consistent Current Sheet Structures in the Quiet Time Magnetotail", D.L. Holland and J. Chen, Geophysical Research Letters, 20, 1775, 1993.
- "Interplanetary Magnetic Clouds: Topology and Driving Mechanism", J. Chen and D.A. Garren, Geophysical Research Letters, 20, 2319, 1993.
- "Particle Motion in  $x$ -dependent Harris-like Magnetotail Models", G.R. Burkhart and J. Chen, Journal of Geophysical Research, 98, 89, 1993.
- "Nonlinear Evolution of a Strongly Sheared Cross Field Plasma Flow", H. Romero and G. Ganguli, Physics of Fluids B, 5, 3163, 1993.
- "Study of Gain in C-band Deflection Cavities for a Frequency-doubling Magnicon Amplifier", S.H. Gold, C.A. Sullivan, B. Hafizi and W.M. Manheimer, IEEE Transactions Plasma Science, 21, 383, 1993.
- "Nonlinear Analysis of a Magnicon Output Cavity", B. Hafizi, S.H. Gold, W.M. Manheimer and P. Sprangle, Physics of Fluids B., 5, 3045, 1993.
- "Small-scale Density Irregularities in the Nightside Venus Ionosphere: Comparison of Theory and Observations", H.D. Huba and J.M. Grebowsky, Journal of Geophysical Research, 98, 3079, 1993.
- "Propagation of Electromagnetic Waves Parallel to the Magnetic Field in the Nightside Venus Ionosphere", J.D. Huba and H.L. Rowland, Journal of Geophysical Research, 98, 5291, 1993.
- "Self-generation of Magnetic Fields by Sheared Flows in Weakly Ionized Plasmas", J.D. Huba and J.A. Fedder, Physics of Fluids B, 5, 3779, 1993.
- "Generation of Waves in the Venus Mantle by the Ion Acoustic Beam Instability", J.D. Huba, Geophysical Research Letters, 20, 1751, 1993.
- "Theory of Kilometer-size Density Waves in the Nightside Venus Ionosphere", J.D. Huba, Geophysical Research Letters, 20, 2763, 1993.
- "Long Time Scale Evolution of High-power Radio Wave Ionospheric Heating", M.J. Keskinen, P.K. Chaturvedi and S.L. Ossakow, Radio Science, 28, 5, 775, 1993.
- "Nonlinear Unstable Auroral-arc Driven Thermospheric Winds in an Ionosphere-magnetosphere Coupled Model", M.J. Keskinen and P. Satyanarayana, Geophysical Research Letters 20, 23, 2687, 1993.
- "Enhanced Acceleration in a Self-modulated-laser Wake-field Accelerator", J. Krall, A. Ting, E. Esarey and P. Sprangle, Physical Review E, 48, 2157, 1993.
- "Electron-hose Instability of a Relativistic Electron Beam in an Ion-focusing Channel", M. Lampe, G. Joyce, S.P. Slinker and D.H. Whittum, Physics of Fluids B, 5, 1888, 1993.
- "Current Neutralization of Intense MeV Proton Beams Transported in Low-pressure Gas", F.C. Young, D.D. Hinshelwood, R.F. Hubbard and M. Lampe, Physical Review Letters, 70, 2573, 1993.

- "Simulation of Electron Beam Transport in Low-pressure Gas Conditioning Cells", R.F. Hubbard, S.P. Slinker, R.F. Fernsler, G. Joyce and M. Lampe, Journal of Applied Physics, 73, 4181, 1993.
- "Physics of Gas Breakdown for Ion Beam Transport in Gas", C.L. Olson, D.D. Hinshelwood, R.F. Hubbard and M. Lampe, Il Nuovo Cimento, 106, 1705, 1993.
- "Electron Beam Quality Limitations and Beam Conditioning in Free Electron Lasers", P. Sprangle, B. Hafizi, G. Joyce and P. Serafim, Nuclear Instruments and Methods A, 331, 6, 1993.
- "Laser Synchrotron Radiation as a Compact Source of Tunable, Short Pulse Hard x-rays", E. Esarey, P. Sprangle, A. Ting and S.K. Ride, Nuclear Instruments and Methods A, 331, 545, 1993.
- "Nonlinear Analysis of Relativistic Harmonic Generation by Intense Lasers in Plasmas", E. Esarey, A. Ting, P. Sprangle, D. Umstadter and X. Liu, IEEE Trans. Plasma Sci., 21, 1, 1993.
- "Methods for Conditioning Electron Beams in Free-electron Lasers", P. Sprangle, B. Hafizi, G. Joyce and P. Serafim, Physical Review Letters, 70, 19, 1993.
- "Nonlinear Thomson Scattering of Intense Laser Pulses from Beams and Plasmas", E. Esarey, S.K. Ride and P. Sprangle, Physics Review E, 48, 3003, 1993.
- "Thomson Backscattered x-rays from an Intense Laser Beam", C.M. Tang, B. Hafizi and S.K. Ride, Nuclear Instruments and Methods A, 331, 371, 1993.
- "Optically Guided Laser Wake-field Acceleration", E. Esarey, P. Sprangle, J. Krall, A. Ting and G. Joyce, Physics of Fluids B, 5, 2690, 1993.
- "RF Convertor Simulation-imposition of the Radiation Condition", D.G. Colombant, Y.Y. Lau, M. Friedman, J. Krall and V. Serlin, International Journal of Infrared Millimeter Waves, 14, 335, 1993.
- "Fundamental and Harmonics of Thomson Backscattered x-rays from an Intense Laser Beam", C.M. Tang, B. Hafizi and S.K. Ride, IEEE Transactions in Plasma Science, 1623, 1993.
- "Properties of Multilayer Films of  $Y_1Ba_2Cu_3O_{7-x}/LaAlO_3$ ", Allen, L. H., Sherrill, G. K., Holm, R. T., Cukauskas, E. J., IEEE Trans. of Applied Superconductivity, Volume 3, Pages 1616-1619, 1993.
- "Impact Ionization and Light Emission in High-Power Pseudomorphic AlGaAs/InGaAs", Tedesco, Carlo, Zanoni, Enrico, Canali, Claudio, Bigliardi, Stefano, Manfredi, Manfredo, Streit, Dwight C., Anderson, Wallace T., JHEMT's, IEEE Transactions on Electron Devices, Volume 40(7), Pages 1211-1214, 1993.
- "Failure Mechanisms in Life-Tested HEMTs", Anderson, W. T., Christianson, K. A., Moglestue, C., Quality and Reliability Engineering International, Volume 9, Pages 367-370, 1993.
- "Theoretical and Experimental Study of Failure Mechanisms in r.f. Reliability Life Tested High Electron Mobility Transistors." Anderson, W. T, Christianson, K. A., Moglestue, C., Materials Science and Engineering, B20, Pages 26-28, 1993.

- "New Tunnelling Transistor for Current Switching Logic." Anderson, W. T., Hartnagel, H. L., Kirchoefer, S. W., International Journal of Electronics, Volume 75(4), Pages 641-645, 1993.
- "Failure Mechanisms in Life Tested HEMTs." Anderson, W. T., Christianson, K. A., Moglestue, C., Quality and Reliability Engineering International, Volume 9, Pages 367-370, 1993.
- "Temperature Dependent GaAs MMIC Radiation Effects." Anderson, W. T., Gerdes, J., Roussos, J. A., IEEE Trans on Nuclear Science, Volume 40(6), Pages 1735-1739, 1993.
- "A Theory of Cavity Excitation by Modulated Electron Beam in Connection with Application to a Klystron Amplifier." Uhm, Han S., Park, G. S., Armstrong, C. M., Physics of Fluids B, Volume 5 (4), Pages 1349-1357, 1993.
- "Realization of Improved Efficiency in a Gyroklystron Amplifier." Park, G. S., Granatstein, V. L., Armstrong, C. M., Malouf, P., Ganguly, A. K., Particle Accelerators, Volume 43 (102), Pages 93-105, 1993.
- "Control of Interface Stoichiometry in InAs/GaSb Superlattices Grown by Molecular Beam Epitaxy." Bennett, Brian R., Shanabrook, B. V., Wagner, R. J., Davis, John L., Waterman, J. R., Appl. Phys. Lett, Volume 63(7), Page 949, 08/16/93.
- "Growth of Thin Ni Films on GaN(0001)-(1 X 1)." Bermudez, V. M., Kaplan, R., Khan, M. A., Kuznia, J. N., Physical Review B, Volume 48(4), Pages 2436-2444, 07/15/93.
- "Infrared Spectroscopic Study of the Chemisorption of CF<sub>3</sub> Species on Silicon." Bermudez, V. M., Applied Physics Letters, Volume 62(25), Pages 3297-3299, 06/21/93.
- "Diamond Metal-Semiconductor-Metal Ultraviolet Photodetectors." Binari, S. C., Marchywka, M., Koolbeck, D. A., Dietrich, H. B., Moses, D., Diamond and Related Materials Journal, Volume 2, Pages 1020-1023, 1993.
- "Circuit Model of Low-Frequency Transconductance and Output Resistance Dispersion in Ion-Implanted InP JFETs." Kruppa, W., Boos, J. B., Microwave and Optical Technology Letters, Volume 6(1), Pages 81-83, 1993.
- "Low-Frequency Gain Dispersion in Ion-Implanted InP JFETs." Kruppa, W., J. B., Solid-State Electronics, Volume 36 (10), Pages 1445-1453, 1993.
- "Impact Ionisation in High-Output-Conductance Region of 0.5 mm AlSb/InAs HEMTs." Boos, J. B., Kruppa, W., Shanabrook, B. V., Park, D., Davis, J. L., Dietrich, H. B., Electronics Letters, Volume 29(21), Pages 1888-1890, 10/14/93.
- "Collective Intersubband Spin- and Charge-Density Excitations in Tilted Magnetic Fields." Brozak, G., Shanabrook, B. V., Gammon, D., Katzer, D. S., Physical Review B, Volume 47(15), Page 9981, 04/15/93.
- "Mesoscopic Physics and Nanoelectronics: Nanoscience and Nanotechnology." Buot, Felix A., Physics Reports, Volume 234(2&3), Pages 73-174, 11/00/93.
- "High-Frequency Behavior of Quantum-Based Devices: Equivalent-Circuit, Nonperturbative Response, and Phase-Space Analyses." Buot, F. A., Rajagopal, A. K., Physical Review B, Volume 48(23), Pages 17217-17232, 11/15/93.

"Successive Charging/Discharging of Gate Oxides in SOI MOSFET's by Sequential Hot-Electron Stressing of Front/Back Channel." Zaleski, Andrzej Ioannou, Dimitris E. , Campisi, George J., Hughes, Harold L., IEEE Electron Device Letters, Volume 14(9), Pages 435-437, 09/00/93.

"The Nature of Donor Conduction in n-GaN," Khan, M. Asif, Olson, D. T., Kuznia, J. N., Carlos, W. E., Freitas, J. A. Jr., Journal of Applied Physics, Volume 74(9), Pages 5901-5903, 11/00/93.

"Atomic Structure of Ge-related Point Defects in Ge-incorporated Oxide Films," Zvanut, M. E., Carlos, W. E., Paine, D. C., Caragianis, C., Applied Physics Letters, Volume 63(22), Pages 3049-3051, 11/29/93.

"Electron-Spin-Resonance Studies of Donors in Wurtzite GaN," Carlos, W. E., Freitas, J. A. Jr., Khan, M. Asif, Olson, D. T., Kuznia, J. N., Physical Review B, Volume 48(24), Page 17878, 12/15/93.

"Microwave Losses in Kinetic-Inductance Devices Fabricated From NbCN/MgO/NbCN Trilayers," Carroll, K. R., Pond, J. M., Cukauskas, E. J., IEEE Trans. on Appl. Superconductivity, Volume 3(1), Pages 2808-2811, 03/00/93.

"Microwave Measurement of the Dielectric Constant of Sr<sub>0.5</sub>Ba<sub>0.5</sub>TiO<sub>3</sub> Ferroelectric Thin Films." Carroll, K. R., Pond, J. M., Chrisey, D. B., Horwitz, J. S., Leuchtner, R. R., Grabowski, K. S., Appl. Phys. Lett., Volume 62(15), Pages 1845-1847, 04/12/93.

"Superconducting Kinetic-Inductance Microwave Filters," Carroll, Kenneth R., Pond, Jeffrey M., Cukauskas, Edward J. , IEEE Trans. on Appl. Superconductivity, Volume 3(1), Pages 8-16, 03/00/93.

"Optically Detected Magnetic Resonance in Zinc-Doped Indium Phosphide Under Uniaxial Stress," Crookham, H. C., Glaser, E. R., Henry, R. L., Kennedy, T. A. , Physical Review B, Volume 48(19), Page 14 157, 11/15/93.

"Morphology and Transport of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> Sputtered in Argon, Oxygen, and Hydrogen: Dependence on Deposition Temperature," Cukauskas, E. J, Allen, L. H., Sherrill, G. K., Holm, R. T., Vold, C., Journal of Applied Physics, Volume 74(11), Pages 6780-6787, 12/01/93.

"The Effects of Added Gases in the Sputter Deposition of Y<sub>1</sub>Ba<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> Thin Films," Cukauskas, E. J., Sherrill, G. K., Allen, L. H., Holm, R. T., IEEE Trans. Applied Superconductivity, Volume 3(1), Pages 1520-1523, 03/01/93.

"MeV Energy Sulfur Implantation in GaAs and InP," Vellanki, Jayadev , Nadella, Ravi K. , Rao, Mulpuri V., Dietrich, Harry B., Simons, David S., Chi, Peter H., J. of Electronic Materials, Volume 22(5), Pages 559-566, 05/00/93.

"Thin Silicon Nitride Films to Increase Resolution in E-beam Lithography," Dobisz, E. A., Marrian, Christie R. K., Salvino, R. E., Rhee, K. W. , Ancona, M. A., Peckerar, Martin C., Optical Engineering, Volume 32(10), Pages 2452-2458, 10/00/93.

"Reduction and Elimination of Proximity Effects," Dobisz, E. A., Marrian, C.R.K., Salvino, R. E., Ancona, M. A., Perkins, F. K., Turner, N. H., Journal of Vacuum Science Technology B, Volume 11(6), Pages 2733-2740, 11-12/00/93.

"Aerosol Doping of Flame Grown Diamond Films." Doverspike, Kathleen, Butler, James E. , Freitas, Jaime A. Jr., Diamond and Related Materials, Volume 2, Pages 1078-1082, 1993.

"X-Ray Double-Crystal Analysis of Misorientation and Strain in GaAs/Si and Related Heterostructures." Fatemi, M., Chaudhuri, J, Mittereder, J., Christou, A., J. Appl. Phys., Volume 73(3), Pages 1154-1160, 1993.

"High-Resolution X-ray Analysis of Strain in Low-Temperature GaAs." Fatemi, M., Tadayon, B., Twigg, M. E., Dietrich, H. B., Physical Review B, Volume 48(12), Pages 8911-8917, 09/15/93.

"Nonlinear Theory of Gyroharmonic Radiation from Spatiotemporally Modulated Electron Beams." Ganguly, A. K., Hirshfield, J. L., Physical Review Letters, Volume 70(3), Pages 291-294, 01/18/93.

Linear Analysis of Backward Wave Oscillations in Azimuthally Varying Transverse Electric (TE) Modes." Ganguly, A. K., Park, G. S., Armstrong, C. M., Physics of Fluids B, Volume 5(5), Pages 1639-1646, 05/00/93.

"Characterization of Crystalline Low Temperature GaAs Layers Annealed from an Amorphous Phase." Giordana, A., Glembocki, O. J, Glaser, E. R., Gaskill, D. K., Kyono, C. S., Twigg, M. E., Fatemi, M., Tadayon, B., Tadayon, S., Journal of Electronic Materials, Volume 22(120), Pages 1391-1393, 1993.

Photoluminescence and Optically Detected Magnetic Resonance of Si/Si<sub>1-x</sub>Ge<sub>x</sub> Strained-Layer Superlattices Grown by Molecular-Beam Epitaxy." Glaser, E. R., Kennedy, T. A., Godbey, D. J., Thompson, P. E., Wang, K. L., Chern, C. H., Physical Review B, Volume 47(3), Page 1305, 01/15/93.

Observation of Optically Detected Magnetic Resonance in GaN Films." Glaser, E. R., Freitas, J. A., Jr., Khan, M. Asif, Olson, D. T., Kuznia, J. N., Appl. Phys. Lett., Volume 63(19) Page 2673, 11/08/93.

"Concentration Dependence of Ge Segregation during the Growth of a SiGe Buried Layer." Godbey, D. J. , Ancona, M. G., J. Vac. Sci. Technol B, Volume 11(4), Pages 1392-1395, 07-08/00/93.

Ge Segregation During the Growth of a SiGe Buried Layer by Molecular Beam Epitaxy." Godbey, D. J., Ancona, M. G., J. Vac. Sci. Techno. B, Volume 11(3), Pages 1120-1123, 05-06/00/93.

"Electronic Structure of c(2X2) Ba Adsorbed on W(001)." Hemstreet, L. A., Chubb, S. R., Physical Review B, Volume 47(16), Page 10748, 04/15/93.

First-Principles Calculations of Spin-Orbit Splittings in Solids using Nonlocal Separable Pseudopotentials." Hemstreet, L. A., Fong, C. Y., Nelson, J. S., Physical Review B, Volume 47(8), Page 4238, 02/15/93.

"Effect of Interfacial Bond Type on the Electronic and Structural Properties of GaSb/InAs Superlattices." Hemstreet, L. A., Fong, C. Y., Nelson, J. S., J. Vac. Sci. Technol. B., Volume 11(4), Page 1693, 07-08/00/93.

"Sb Surface Segregation and Doping in Si(100) Grown at Reduced Temperature by Molecular Beam Epitaxy." Hobart, K. D., Godbey, D. J., Thompson, P. E., Simons, D. S., Appl. Phys. Lett, Volume 63(10), Pages 1381-1383, 1993.

"Sb Surface Segregation During Heavy Doping of Si(100) Grown at Low Temperature by Molecular Beam Epitaxy." Hobart, K. D., Godbey, D. J., Thompson, P. E., Simons, D. S., J. Vac. Sci. Technol. B, Volume 11(3), Pages 1115-1119, 05-06/00/93.

"Field Emission from an Elliptical Boss: Exact Versus Approximate Treatments." Jensen, K. L., Zaidman, E. G., Appl. Phys. Lett., Volume 63(5), Pages 702-704, 08/02/93.

"Numerical Simulation of Field Emission from Silicon." Jensen, K. L., Ganguly, A. K., Journal of Vacuum Science Technology B, Volume 11(2), Pages 371-378, 03-04/93.

"Deposition and Surface Characterization of High Quality Single Crystal GaN Layers." Khan, M. Asif, Kuznia, J. N., Olson, D. T., Kaplan, R., Journal of Applied Physics, Volume 73(6), Pages 3108-3110, 03/15/93.

"Influence of Buffer Layers in the Deposition of High Quality Single Crystal GaN Over Sapphire Substrates." Kuznia, J. N., Khan, M. Asif, Olson, D. T., Kaplan, R., Freitas, Jamie, Journal of Applied Physics, Volume 73(9), Pages 4700-4702, 05/01/93.

"Comparison of Optical Pyrometry and Infrared Transmission Measurements on Indium-Free Mounted Substrates During Molecular-Beam Epitaxial." Katzer, D. S., Shanabrook, B. V., J. Vac. Sci. Technol. B, Volume 11(3), Pages 1003-1006, 05-06/00/93.

"Lifetime of Excitons in GaAs Quantum Wells." Sermage, B., Long, S., Deveaud, B., Katzer, D. S., Journal de Physique IV, Volume 3, Pages 19-25, 10/00/93.

"Optically Detected Magnetic Resonance of Sharp Luminescence from Si/Si<sub>1-x</sub>Gex Superlattices." Kennedy, T. A., Glaser, E. R., Godbey, D. J., Thompson, P. E., Chern, C. H., Wang, K. L., Xiao, X., Sturm, J. C., J. Vac. Sci. Technol. B, Volume 11(3), Page 1154, 05-06/00/93.

"Observation of New Vibronic Luminescence Band in Semiconducting Diamond." Freitas, J. A., Klein, P. B., Collins, A. T., Electronics Letters, Volume 29(19), Page 1727, 09/00/93.

"Nonreciprocal Electromagnetic Properties of Composite Chiral-Ferrite Media." Krowne, C. M., IEE Proceedings-H, Volume 140(3), Pages 242-248, 1993.

"Submillimeter Wave Low Temperature Admittance of N-GaAs and N-InP Diode Structures." Krowne, Clifford, Blakey, Peter A., Journal of Applied Physics, Volume 74(4), Pages 2633-2637, 08/15/93.

"Compressing Photodetectors for Long Optical Pulses Using a Lateral Blooming Drain Structure." Kub, Fritz J., Anderson, Gordon Wood, IEEE Transactions on Electron Devices, Volume 40(10), Pages 1740-1744, 10/00/93.

"Diode Structures from Amorphous Low-Temperature GaAs." Kyono, C. S., Tadayon, B., Twigg, M. E., Giordana, A., Simons D. S., Fatemi, M., Tadayon, S., J. of Electronic Materials, Volume 22(12), Pages 1437-1440, 1993.

"Theory of Electromagnetic Wave Propagation in Superlattices with Optically Anisotropic Layers." Lin-Chung, P. J., Superlattices and Microstructures, Volume 13(1), Page 93, 1993.

"Subband Structures of Strained AlSb/InAs/AlSb Quantum Wells. Lin-Chung, P. J., Yang, M. J., Physical Review B, Volume 48(8), Page 5338, 08/15/93.

"Observation of Ion-Implantation-Damage-Created n-Type Conductivity in InP after High-Temperature Annealing," Molnar, B., Kennedy, T. A., Glaser, E. R., Dietrich, H. B., J. Appl. Phys., Volume 74(5), Pages 3091-3098, 09/01/93.

"Identification and Activation Energies of Shallow Donors in Cubic SiC," Moore, W. J., J. Appl. Phys., Volume 74(3), Page 1805, 08/01/93.

"Nitrogen Donor Excitation Spectra in 3C-SiC)," Moore, W. J., Lin-Chung, Pay-June, Freitas, J. A. Jr., Altaiskii, Y. M., Zuev, V. L., Ivanova, L. M., Physical Review B, Volume 48(16), Page 12289, 10/15/93.

"Hydrogen Permeability in Thermally Grown Films of SiO<sub>2</sub> on Silicon Substrates," Mrstik, B. J., McMarr, P. J., Saks, N. S., Rendell, R. W., Klein, R. B., Physical Review B, Volume 47(7), Pages 4115-4118, 02/15/93.

"Evidence of Long-Range Density Gradient in SiO<sub>2</sub> Films on Si from H<sub>2</sub>-Permeability Measurements," Mrstik, B. J., McMarr, P. J., Physical Review B, Volume 48(24), Pages 17-972-17-985, 12/15/93.

"Losses in Y-Junction Stripline and Microstrip Ferrite Circulators," Neidert, Robert E., Phillips, Purobi M., IEEE Transactions on Microwave Theory and Techniques, Volume 41(6/7), Pages 1081-1086, 06-07/00/93.

"Measurement of the Current-Density Distribution in High-Temperature Superconducting Microstrip by Means of Kinetic-Inductance Photoresponse," Newman, Harvey S., Culbertson, James C., Microwave and Optical Technology Letters, Volume 6(13), Pages 725-728, 10/00/93.

"Viscoelastic Properties of Amorphous Polymers. 2. Anomalous Temperature Dependence of the Steady-State Recoverable Compliance in Low Molecular Weight Polymers," Ngai, K. L., Plazek, D. J., Bero, C. A., Macromolecules, Volume 26(5), Pages 1065-1071, 1993.

"Extended Kronmuller Model for Cooperative Relaxations in Metallic Glasses," Colmenero, J., Alegria, A., Telleria, I., Ngai, K. L., Physical Review B, Volume 47(9), Pages 5041-5046, 03/01/93.

"Single Particle Jumps and Correlated Ionic Motions in Glass-Ceramics," Bohmer, R., Gerhard, G., Drexler, F., Loidl, A., Ngai, K. L., Pannhorst, W., Journal of Non-Crystalline Solid, Volume 155, Pages 189-193, 1993.

"Comparisons Between Coupling Model and Molecular Dynamics Simulation for Local Chain Motions in Bulk Amorphous Polymers," Ngai, K. L., J. Chem. Phys., Volume 98 (9), Pages 7588-7592, 05/01/93.

"Breakdown of the Rouse Model for Polymers Near the Glass Transition Temperature," Plazek, D. J., Schlosser, E., Schønhals, A., Ngai, K. L., J. Chem. Phys., Volume 98(8), Pages 6488-6491, 04/15/93.

"Difference Between Nuclear Spin Relaxation and Ionic Conductivity Relaxation in Superionic Glasses," Ngai, K. L., J. Chem. Phys., Volume 98(8), Pages 6424-6430, 04/15/93.



"Intermolecular Cooperativity and the Temperature Dependence of Segmental Relaxation in Semicrystalline Polymers." Ngai, K. L., Roland, C. M., Macromolecules, Volume 26(11), Pages 2688-2690, 05/24/93.

"Comparisons Between  $^{23}\text{Na}$  and  $^{27}\text{Al}$  Nuclear Spin Relaxations and Electrical Conductivity Relaxation in Na b-Alumina." Ngai, K. L., Solid State Ionics, Volume 61, Pages 345-353, 1993,

"Dynamic Lights Scattering Study of a 1,4-Isoprene-b-Styrene Copolymer." Rizos, A. K., Fytas, G., Roovers, J. E. L., Ngai, K. L., Progress in Colloid & Polymer Science, Volume 91, Pages 72-74, 1993.

"Solvent Reorientation Dynamics in Aroclor/Polymer Solutions." Rizos, A. K., Fytas, G., Ngai, K. L., Progress in Colloid & Polymer Science, Volume 91, Pages 135-137, 1993.

"Cooperative Dynamics in Relaxation: A Coupling Model Perspective." Ngai, K. L., Rendell, R. W., Journal of Molecular Liquids, Volume 56, Pages 199-214, 1993.

"Nonexponential Relaxations in Strong and Fragile Glass Formers." Bohmer, R., Ngai, K. L., Angell, C. A., Plazek, D. J., J. Chem. Phys., Volume 99(5), Pages 4201-4209, 09/01/93.

"Absence of Difference Between  $^{11}\text{B}$  Nuclear Spin Relaxation and Li Ion Conductivity Relaxation in  $(\text{LiCl})_{0.6}-(\text{Li}_2\text{O})_{0.7}-\text{B}_2\text{O}_3)_{1.0}$  Superionic Glasses." Ngai, K. L., Journal of Non-Crystalline Solids, Volume 162, Pages 268-274, 1993.

"Analysis of NMR and Conductivity-Relaxation Measurements in Glassy  $\text{Li}_2\text{S}-\text{SiS}_2$  Fast-Ion Conductors." Ngai, K. L., Physical Review B, Volume 48(18), Pages 13 481-13 485, 11/01/93.

"Chemical Structure and Intermolecular Cooperativity: Dielectric Relaxation Results." Ngai, K. L., Roland, C. M., Macromolecules, Volume 26 (25), Pages 6824-6830, 12/26/93.

"Space Applications of High Temperature Superconductivity: The High Temperature Superconductivity Space Experiment (HTSSE)." Nisenoff, M., Wolf, S. A., Ritter, J. C., Price, G., Physica C, Volume 209, Pages 263-268, 05/00/93.

"Sequential Etching of GaAs." Nordquist, P. E. R., Henry, R. L., Gorman, R. J., Journal of Crystal Growth, Volume 128, Pages 483-487, 1993.

"Magneto-Optic and Magnetotransport Study of  $\text{InAs}/\text{Ga}_{1-x}\text{In}_x\text{Sb}$  Superlattices." Omaggio, J. P., Wagner, R. J., Meyer, J. R., Hoffman, C. A., Yang, M. J., Chow, D. H., Miles, R. H., Semiconductor Science and Technology, Volume 8, Pages S112-S116, 1993.

"Magnet-Optical Determination of T-Point Energy Gap in Bismuth." Omaggio, J.P., Meyer, J. R., Hoffman, C. A., DiVenere, A., Yi, X. J., Hou, C. L., Wang, H. C., Ketterson, J. B., Wong, G.K., Heremans, J. P., Physical Review B, Volume 48(15), Pages 439-442, 10/15/93.

"Reactive Ion Etching of b-SiC in  $\text{CCl}_2\text{F}_2/\text{O}_2$ ." Kuzmik, J., Michelakis, C., Konstantinidis, G., Papanicolaou, N., Electronics Letters, Volume 29(1), Pages 18 and 19, 01/01/93.

"Lattice Mismatched InGaAs on Silicon Photodetectors Grown by Molecular Beam Epitaxy." Papanicolaou, N. A., Anderson, G. W., (NRL 6813)Iliadis, A. A., Christou, A., Journal of Electronic Materials, Volume 22(2), Pages 201-206, 01/07/93.

"Proximity Effect Reduction Using Thin Insulating Layers," Peckerar, Rhee, Kee Woo, Peckerar, Martin C., Applied Physics Letters, Volume 62(5), Pages 533-534, 02/01/93.

"Surface Characterization," McGuire, G. E., Ray, M. A., Simko, Steven J., Perkins, F. Keith, Brandow, Susan L., Dobisz, Elizabeth A., Nemanich, R. J., Chourasia, A. R., Chopra, D. R., Analytical Chemistry, Pages 311R-333R, 06/15/93.

"Determination of Acid Diffusion Rate in a Chemically Amplified Resist With Scanning Tunneling Microscope Lithography," Perkins, F. Keith, Dobisz, Elizabeth A., Marrian, Christie R. K., Journal of Vacuum Science Technology B, Volume 11(6), Pages 2597-2602, 1993.

"YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-8</sub>/LaAlO<sub>3</sub>/YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-8</sub> Trilayers Transmission Lines for Measuring the Superconducting Penetration Depth," Pond, J. M., Carroll, K. R., Horwitz, J. S., Chrisey, D. B., IEEE Trans. on Appl. Superconductivity, Volume 3 (1), Pages 1438-1441, 03/00/93.

"A Novel Microstrip-Compatible Technique for Depositing YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-8</sub> on Both Surfaces of a Substrate," Pond, J. M., Carroll, K. R., Chrisey, D. B., Horwitz, J. S., Cestone, V. C., IEEE Trans. on Appl. Superconductivity, Volume 3(1), Pages 1711-1714, 03/00/93.

"Structure of Intralayer and Interlayer Pairing Interactions, the Anisotropy of Order Parameters, and the Transition Temperature in Layered Superconductors," Rajagopal, A. K., Sudhanshu, S. Jha, Physical Review B, Volume 47(5), Pages 2780-2795, 02/01/93.

"Coordinate and Momentum Representations of the q-Deformed Oscillator and Their Interpretation," Rajagopal, A. K., Physical Review A, Volume 47(5) Part A, Pages R3465-R3467, 05/00/93.

"Superconductivity in High Magnetic Fields from a Microscopic Theory," Rajagopal, A. K., Frontiers in Solid State Sciences, Volume 1, Pages 193-209, 1993.

"Plasmons Localized at Point Charges in Semiconductor Quantum Wells," Rudin, S., Reinecke, T. L., Volume 48(4), Page 2223, 07/15/93.

"Surface Modes of the Clean Reconstructed W(100) Surface," Reinecke, T. L., Ying, S. C., Physical Review B, Volume 48(8), Page 5679, 08/15/93.

"Electron-Phonon Scattering Rates in Quantum Wires," Knipp, P. A., Reinecke, T. L., Physical Review B, Volume 48(8), Page 5700, 08/15/93.

"Coupling of Electrons to Interface Phonons in Semiconductor Quantum Wells," Knipp, P. A., Reinecke, T. L., Physical Review B, Volume 48(16), Page 12338, 10/15/93.

"Effects of Boundary Conditions on Confined Optical Phonons in Semiconductor Nanostructures," Knipp, P. A., Reinecke, T. L., Physical Review B, Volume 48(24), Page 18 037, 12/15/93.

"Interaction of a Relaxing System with a Dynamical Environment," Rendell, R. W., Physical Review E, Volume 48(1), Pages R17-R20, 07/00/93.

"Vortex-Lattice Solutions of the Microscopic Gorkov Equations for a Type II Superconductor in a Strong Quantizing Magnetic Field," Ryan, J. C., Rajagopal, A. K., Physical Review B, Volume 47(14), Pages 8843-8850, 04/01/93.

"Manifestations of the Landau Quantization in Type II Superconductors in High Magnetic Fields." Ryan, J. C., Rajagopal, A. K., Journal of Physics and Chemical Solids, Volume 54(10), Pages 1281-1282, 1993.

"Comparison of Interface Trap Densities Measured by the Jenq and Charge Pumping Techniques." Saks, N. S., J. Appl. Phys., Volume 74(5), Pages 3303-3306, 09/01/93.

"Effects of Post-Stress Hydrogen Annealing on MOS Oxides after  $^{60}\text{Co}$  Irradiation or Fowler-Nordheim Injection." Saks, N. S., Klein, R. B., Stahlbush, R. E., Mrstik, B. J., Rendell, R. W., IEEE Transactions on Nuclear Science, Volume 40(6), Pages 1341-1349, 12/00/93.

"Random Telegraphic Noise in Double-Barrier Systems." Salvino, R. E., Buot, F. A., Applied Physics Letters, Volume 63(19), Pages 2652-2654, 11/08/93.

"Planar Vibrational Modes in Superlattices." Shanabrook, B. V., Bennett, B. R., Wagner, R. J., Physical Review B, Volume 48(23), Page 17172, 12/15/93.

"Electron Transport and Magnetic Penetration Depth in Niobium-Silicon Multilayers." Sherrill, G. K., Cukauskas, E. J., Allen, L. H., IEEE Trans. Applied Superconductivity, Volume 3(1), Pages 1612-1615, 1993.

"Secondary Emission Properties as a Function of the Electron Incidence Angle." Shih, Arnold, Hor, Charles, IEEE Transactions on Electron Devices, Volume 40(4), Pages 824-829, 04/00/93.

"Lattice Position of Si in GaAs Determined by X-Ray Standing Wave Measurements." Shih, A., Cowan, P. L., Southworth, S., Fotiadis, L., Hor, C., Karlin, B., Moore, F., Dobisz, E., Dietrich, H., J. Appl. Phys., Volume 73(12), Pages 8161-8168, 06/15/93.

"Optical Absorption Spectroscopy of Single Defects in GaAs/Al<sub>x</sub>Ga<sub>1-x</sub>As Tunnel Structures." Snow, E. S., Campbell, P. M., Katzer, D. S., Physical Review B, Volume 47(23), Page 16032, 06/15/93.

"Fabrication of Silicon Nanostructures with a Scanning Tunneling Microscope." Snow, E. S., Campbell, P. M., McMarr, P. J., Appl. Phys. Lett., Volume 63(6), Page 749, 08/09/93.

"Fabrication of GaAs Nanostructures with a Scanning Tunneling Microscope." Snow, E. S., Campbell, P. M., Shanabrook, B. V., Appl. Phys. Lett., Volume 63(25), Page 3488, 12/20/93.

"Reduction of Charge Trapping and Electron Tunneling in SIMOX by Supplemental Implantation of Oxygen." Stahlbush, R. E., Hughes, H. L., Krull, W. A., IEEE Transactions on Nuclear Science, Volume 40(6), Pages 1740-1747, 12/00/93.

"Post-Irradiation Cracking of H<sub>2</sub> and Formation of Interface States in Irradiated Metal-Oxide-Semiconductor Field-Effect Transistors." Stahlbush, R. E., Edwards, A. H., Griscom, D. L., Mrstik, B. J., Journal of Applied Physics, Volume 73(2), Pages 658-667, 01/15/93.

"Low-Frequency Excitations in Sodium b-Alumina: An NMR Study." Sieranski H., Kanert, O., Backens, M., Strom, U., Ngai, K. L., Physical Review B, Volume 47(2), Page 681, 01/01/93.

"Photoluminescence and Cathodoluminescence Studies of Semiconducting Diamond." Freitas, J. A. Jr., Strom, U., Collins, A. T., Diamond and Related Materials, Volume 2, Page 87-91, 1993.

"Application of Micro-Airbridge Isolation in High Speed HBT Fabrication." Tadayon, S., Metzger, G., Cornfeld, A., Pande, K., Huang, H., Tadayon, B., Electronics Letters, Volume 29(1), Pages 26-27, 01/07/93.

"Characterization of Molecular Beam Epitaxially Grown InSb Layers and Diode Structures." Lee, G. S., Thompson, P. E., Davis, J. L., Omaggio, J. P., Schmidt, W. A., Solid State Electronics, Volume 36(3), Pages 387-389, 1993.

"Bonded Wafer Substrates for Integrated Detector Arrays." Wang, J. J., King, E. E., Leonov, P., Huang, D. H., Thompson, P., Godbey, D., IEEE Transactions on Nuclear Science, Volume 40(5), Pages 1342-1346, 10/00/93.

"Controlled p- and n-Type Doping of Homo- and Heteroepitaxially Grown InSb." Thompson, Phillip E., Davis, John L., Yang, Ming-Jey, Simons, David S., Chi, Peter H., J. Appl. Phys., Volume 74(11), Pages 6686-6690, 12/01/93.

"Parametric Investigation of Si<sub>1-x</sub>Gex/Si Multiple Quantum Well Growth." Thompson, Phillip E., Godbey, David, Hobart, Karl, Glaser, Evan, Kennedy, Thomas, Twigg, Mark, Simons, David, SSDM 93, Japan Society of Applied Physics, Pages 234-236, 08-09/00/93.

"Low Temperature Cleaning Processes for Si Molecular Beam Epitaxy." Thompson, P. E., Twigg, M. E., Godbey, D. J., Hobart, K. D., Simons, D. S., J. Vac. Sci. and Techno. B, Volume 11(3), Pages 1077-1082, 05-06/00/93.

"Optically Detected Magnetic Resonance of Shallow Donors in GaAs." Trombetta, J. M., Kennedy, T. A., Physical Review B, Volume 48(23), Page 17 031, 12/15/93.

"Solid-Phase Regrowth of Amorphous GaAs Grown by Low-Temperature Molecular-Beam Epitaxy." Twigg, M. E., Fatemi, M., Tadayon, B., Appl. Phys. Lett, Volume 63(3), Pages 320-321, 07/19/93.

"Field Theory of a Traveling Wave Tube Amplifier with a Tape Helix." Freund, H. P., Vanderplaats, N. R., (NRL 6843)Kodis, M. A., IEEE Transactions on Plasma Science, Volume 21(6), Pages 654-668, 12/00/93.

"The Effect of Interface Bond Type on the Structural and Optical Properties of GaSb/InAs Superlattices." Waterman, J. R., Shanabrook, B. V., Wagner, R. J., Yang, M. J., Davis, J. L., Omaggio, J. P., Semiconductor Science and Technology, Volume 8, Pages S106-S111, 1993.

"Enhancement of Cyclotron Mass in Semiconductor Quantum Wells." Yang, M. J., Lin-Chung, P. J., Shanabrook, B. V., Waterman, J. R., Wagner, R. J., Moore, W. J., Physical Review B, Volume 47(3), Pages 1691-1694, 01/15/93.

"Dependence of InAs Phonon Energy on Misfit-Induced Strain." Yang, M. J., Wagner, R. J., Shanabrook, B. V., Moore, M. J., Waterman, J. R., Yang, C. H., Fatemi, M., Applied Physics Letters, Volume 63(25), Pages 3434-3436, 12/20/93.

"Spin-Resolved Cyclotron Resonance in InAs Quantum Wells: A Study of the Energy Dependent g-Factor." Yang, M. J., Wagner, R. J., Shanabrook, B. V., Waterman, J. R., Moore, W. J., Physical Review B, Volume 47(11), Pages 6807-6810, 03/15/93.

"Simulation of Field Emission Microtriodes." Zaidman, Ernest G., IEEE Transactions on Electron Devices, Volume 40(5), Pages 1009-1016, 05/00/93.

"Transient Changes in the Mononuclear Phagocyte System Following Administration of the Blood Substitute, Liposome Encapsulated Hemoglobin", H. Spielberg, R.O. Cliff\*, and A.S. Rudolph, Biomaterials, accepted (as of 12/93).

"The Development of an Evanescent Wave Fiber Optic Biosensor", G. Anderson, J. Golden, L. Shriver-Lake, F.S. Ligler, L. Cao, and D. Wijesuriya\*, IEEE Engineering in Medicine and Biology, accepted (as of 1/93).

"Low Voltage Electron Beam Lithography in Self-Assembled Ultrathin Films With the Scanning Tunneling Microscope", C.R.K. Marrian, F.K. Perkins, S.L. Brandow T.S. Koloski, E.A. Dobisz, and J.M. Calvert, Journal of Applied Physics Letters, 64(3):1-3 (1993).

"Polymerizable Phospholipids: A Novel Class of Biomaterials", A. Singh and J.M. Schnur, special edition of Polymers for Advanced Technologies, accepted (as of 12/93).

"L-Proline-Modified Nylons. 1. The Alternating Copolyamide of L-Proline and 11-Aminoundecanoic Acid", H. S-W Hu, J.R. Campbell, and J.R. Griffith (6120), Journal of Polymer Science, Part G: Polymer Chemistry, accepted (as of 1/93).

"The Stabilization of Tubules Formed From Heterobifunctional Phospholipids", A. Singh and M.A. Markowitz, New Journal of Chemistry, accepted (as of 8/93).

"Circulation Profile of Technetium-99m-Labeled Liposome Encapsulated Hemoglobin in a 10% or 50% Rat Hypovolemic Shock Model", G. Goins, R. Klipper, J. Sanders, A.S. Rudolph, and W.T. Phillips, Biomaterials, Artificial Cells & Immob. Biotechnology, in press (as of 5/93).

"Lyophilized Liposome Encapsulated Hemoglobin: Evaluation of Hemodynamic, Biochemical, and Hematological Responses", R. Rabinovici, A.S. Rudolph, J. Vernick, and G. Feuerstein, Critical Care Medicine, in press (as of 5/93).

"Conformation of Polymerizable Diacetylenic Lecithin, Dg<sub>9</sub>PC, By <sup>1</sup>H NMR Spectroscopy", K.R.K. Easwaran, S.V. Balasubramanian, and A. Singh, Chemistry and Physics of Lipids, accepted (as of 8/93).

"Novel Ferroelectric Liquid Crystalline Polymers With Fast Electro-Optic Switching Times", J. Naciri, S. Mery, S. Pfeiffer, and R. Shashidhar, Society for Information Display, accepted (as of 8/93).

"Stability Analysis of an Autounloading AC Bridge for Use With Silicon-Based Sensors", P.P. Bey, Jr., D.J. Yonce, and T.L. Fare, IEEE Transactions on Circuits and Systems, accepted (as of 8/93).

"Measurement of Acetylcholine Receptor Function in Microcircuit-Coupled Myoblasts", J.N. Quong, D. Stenger, T.L. Fare, H.J. Bryant, IEEE Transactions on Biomedical Engineering, accepted (as of 8/93).

"The Use of Compatible Solutes in the Long-Term Preservation of Lipid Microstructures", A.S. Rudolph, R.O. Cliff, and B.J. Spargo, Cytobiology, in press (as of 9/93).

"Structural and Thermodynamic Investigation of Filament Formation in a Diacetylenic Phospholipid", M.A. Davies, B.R. Ratna, and A.S. Rudolph, Langmuir, in press (as of 10/93).

"Novel Ferroelectric Liquid Crystalline Polymers With Fast Electro-Optic Switching Times", J. Naciri, R. Shashidhar, S. Mery, and S. Pfeiffer, *Journal of the Society for Information Displays*, in press (as of 10/93).

"Raman Active Skeletal-Optical Vibrations of Hydrocarbon Chain Segments in a Series of Diacetylenic Lipids", P.E. Schoen, A. Singh, and M. Nagumo, *Chemistry and Physics of Lipids*, in press (as of 10/93).

"Ferroelectric Properties of Mixtures of a Liquid Crystalline Polymer and its Side-Group Mesogens", J. Ruth, J. Naciri, and R. Shashidhar, *Liquid Crystals*, in press (as of 10/93).

"Non-Specific Inhibition of Plasmodia by Phosphorothioate DNA Oligomers", D.L. Clark, L.A. Chrisey, J.R. Campbell, and E.A. Davidson, *Molecular and Biochemical Parasitology*, in press (as of 10/93).

"Patterning of Self-Assembled Films Using Lithographic Exposure Tools", W.J. Dressick and J.M. Calvert, *invited paper, Japanese Journal of Applied Physics*, accepted (as of 10/93).

"Biomaterial Biotechnology Using Self-Assembled Lipid Microstructures", A.S. Rudolph, *Journal of Cellular Biochemistry*, in press (as of 10/93).

"Tin-Free Catalysts for Electroless Metal Deposition at Ligand-Modified Surfaces", W.J. Dressick, C.S. Dulcey, J.H. Georger, Jr, G.S. Calabrese, M. Gulla, and J.M. Calvert, *J. Electrochemical Society*, accepted (as of 10/93).

"Nano Vision -- Molecular Graphics for the Macintosh", W.R. Light and B.P. Gaber, *Journal of Molecular Graphics*, accepted (as of 11/93).

"Fabrication of Surfaces Resistant to Protein Adsorption and Application to Two-Dimensional Protein Patterning", S.K. Bhatia, J.L. Teixeira, M. Anderson, L.C. Shriver-Lake, J.M. Calvert, J.H. Georger, J.J. Hickman, C.S. Dulcey, P.E. Schoen, and F.S. Ligler, *Analytical Biochemistry*, 208:197-205 (1993).

"Photopatterning and Selective Electroless Metallization of Surface-Attached Ligands", W.J. Dressick, C.S. Dulcey, J.H. Georger, Jr., and J.M. Calvert, *Chemistry of Materials*, 5:148-150 (1993).

"Silica-Deposited Phospholipid Tubules as a Precursor to Hollow Submicron-Diameter Silica Cylinders", S. Baral and P. Schoen, *Chemistry of Materials*, 5(2):145-147 (1993).

"Palladium Ion Assisted Formation and Metallization of Lipid Tubules", M. Markowitz, S. Baral\*, S. Brandow, and A. Singh, *Thin Solid Films*, 224:242-247 (1993).

"A Fiber Optic Evanescent Wave Immunosensor for Large Molecules", L.C. Shriver-Lake, R.A. Ogert, and F.S. Ligler, *Sensors and Actuators B*, 11(1-3):239-243 (1993).

"Rapid and Specific Identification of Yersinia pestis Using a Nested Polymerase Chain Reaction Procedure", J.R. Campbell, J. Lowe, S.E. Walz, and J. Ezzel, *Journal of Clinical Microbiology*, 31(3):758-759 (1993).

"Protein Composition of Rhabidosomes Isolated From Aquaspirillum Itersonii", M. Pazirandeh and J.R. Campbell, *Journal of General Microbiology*, 139:859-864 (1993).

"Entrapment and Release Characteristics of 2-Methoxynaphthalene From Cylindrical Microstructures Formed From Phospholipids", R. Price and M. Patchan, *Journal of Microencapsulation*, 10(2):215-222 (1993).

"Nanostructured Co-Cu Powders via a Chemical Route", G.M. Chow, T. Ambrose, J. Xiao, F. Kaatz, and A. Ervin, *Journal of Nanostructured Materials*, 2:131-138 (1993).

"Formation of Self-Arranging Mo Cubes", A.S. Edelstein, F.H. Kaatz, G.M. Chow, E.I. Altman, R.J. Colton, M.R. Pederson, and M.J. Mehl, *Solid State Communications*, 86(5):323-326 (1993).

"Scanning Tunneling Microscopic Study of the Interfacial Order in a Ferroelectric Liquid Crystal", S.L. Brandow, J.A. Harrison, D.P. DiLella, R.J. Colton, S. Pfeiffer, and R. Shashidhar, *Liquid Crystals*, 13(1):163-170 (1993).

"Soft X-ray (14nm) Lithography With Ultrathin Imaging Layers and Selective Electroless Metallization", J.M. Calvert, T.S. Koloski, W.J. Dressick, C.S. Dulcey, M.C. Peckerar (6860), F. Cerrina, J.W. Taylor, D. Suh, O.R. Wood II, A.A. MacDowell, and R. D'Souza, *SPIE*, 1924:30-41 (1993).

"Formation of Lipid Tubule Microstructures: Time Resolved Freeze-Fracture Electron Microscopy and X-ray Characterization", P.E. Schoen, R.R. Price, J.M. Schnur, A. Gulik, and T. Gulik-Krzywicki, *Chemistry and Physics of Lipids*, (1993).

"Top Surface Imaging Using Selective Electroless Metallization of Patterned Monolayer Films", J.M. Calvert, W. Dressick, C.S. Dulcey, D.A. Stenger, M.S. Chen\*, J.H. Georger, T. Koloski, and G. Calabrese, invited paper, *ACS Symposium Series on Polymers for Microelectronics*, 537:210 (1993).

"Modification of Supported Lipid Membranes by Atomic Force Microscopy", S.L. Brandow, D.C. Turner, B.R. Ratna, and B.P. Gaber, *Biophysical Journal*, 64:898-902 (1993).

"Dynamics of Phospholipid Tubules in a Concentrated Solution: Results From High-Field Magnetic Birefringence and Quasielastic Light Scattering", S. Sprunt, G. Nounesis, J.D. Lister, B.R. Ratna, and R. Shashidhar, *Phys. Rev. E*, 47(5):3477 (1993).

"High-Field Magnetic Birefringence Study of the Phase Behavior of Concentrated Solutions of Phospholipid Tubules", S. Sprunt, G. Nounesis, J.D. Lister, B.R. Ratna, and R. Shashidhar, *Phys. Rev. E*, 48(1):328 (1993).

"Projection X-ray Lithography With Ultrathin Imaging Layers and Selective Electroless Metallization", J.M. Calvert, M.S. Chen, F. Cerrina, W.J. Dressick, C.S. Dulcey, T.S. Koloski, A.A. MacDowell, M.C. Peckerar (6864), D. Suh, J.W. Taylor, and O.R. Wood, invited paper, *Optical Engineering*, 32(10):30 (1993).

"A New Salutory Resuscitative Fluid: Liposome Encapsulated Hemoglobin (LEH)/ Hypertonic Saline Solution", R. Rabinovici, A.S. Rudolph, J. Vernick, and G. Feuerstein, *Journal of Trauma*, 35(1):121-127 (1993).

"Performance Enhancement of Natural Antifouling Compounds and Their Analogs Through Microencapsulation and Controlled Release", R.R. Price, M. Patchan, A. Clair, D. Ritchoff, and J. Bonaventura, in proceedings of the International Conference on Biofouling, M. Frances-Thompson, ed., AIBS, Washington, DC, pg 321-334 (1993).\*

"X-ray Diffuse Scattering Study of Static Undulations in Multilayer Films of a Liquid-Crystalline Polymer", R.E. Geer, R. Shashidhar, A.F. Thibodeux, and R.S. Duran, *Physical Review Letters*, 71(9):1391-1394 (1993).

"Lipid Tubules: A Paradigm for Molecularly Engineering Structures", J.M. Schnur, *Science*, 262:1669-1676 (1993).

"Theory of Chiral Lipid Tubules", J.V. Selinger and J.M. Schnur, *Physical Review Letters*, 71(24):4091-4094 (1993).

"The Langkat Model for Tick-Borne Encephalitis Virus. Specific Detection by RT-PCR", J.R. Campbell, L. Iacono-Connors, S.E. Walz, and W.W. Schultz, *Journal of Virological Methods*, 44:235-240 (1993).

"Adhesive Electroless Metallization of Fluoropolymeric Substrates", T.G. Vargo, J.A. Gardella, J.M. Calvert, and M.S. Chen, *Science*, 262:1711 (1993).

"Ferroelectricity in a Langmuir-Blodgett Multilayer Film of a Liquid Crystalline Side-Chain Polymer", S. Pfeiffer, R. Shashidhar, T.L. Fare, J. Naciri, J. Adamss, and R.S. Duran, *Applied Physics Letters*, 63(9):1285-1287 (1993).

"Surface Determinants of Neuronal Survival and Growth on Self-Assembled Monolayers in Culture", D.A. Stenger, C.J. Pike, J.J. Hickman, and C.W. Cotman, *Brain Research*, 630:136-147 (1993).

"Lithographic Patterning of Self-Assembled Monolayer Films", J.M. Calvert, invited paper, *Journal of Vacuum Technology B*, 11(6):2155 (1993).

"TEM and HRTEM Characterization of Metallized Nanotubules Derived From Bacteria", G.M. Chow, J.R. Campbell, M. Pazirandeh, and S. Baral, *Nanostructured Materials*, 2:495-503 (1993).

"Fiber Optic Biosensor: Combination Tapered Fibers Designed for Improved Signal Acquisition", G.P. Anderson, J.P. Golden, and F.S. Ligler, *Biosensors & Bioelectronics*, 8:249-256 (1993).

"Fiber Optic Biosensor for the Detection of Hazardous Materials", F.S. Ligler, J.P. Golden, L.C. Shriver-Lake, R.A. Ogert, D. Wijesuria, and G.P. Anderson, *Immunomethods*, 3:122-127 (1993).

"Continuous Flow Immunosensor for Detection of Explosives", J.P. Whelan, A.W. Kusterbeck, G.A. Wemhoff, R. Bredehorst, and F.S. Ligler, *Analytical Chemistry*, (1993).

"Adhesive Electroless Metallization of Fluoropolymeric Substrates", T. Vargo, J. Gardella, Jr., J.M. Calvert, and M.S. Chen, *Science*, 262:1711-1712 (1993).

"Biodistribution and Imaging Studies of Technetium<sup>99m</sup> Labeled Liposomes in Rats With Focal Infection", B.A. Goins, R. Klipper, A.S. Rudolph, R.O. Cliff, R. Blumhardt, and W.T. Phillips, *Journal of Nuclear Medicine*, 34(12):2160-2168 (1993).

"Soft X-ray Photochemistry of Chemisorbed Self-Assembled Monolayers", D. Suh, J.K. Simons, J.W. Taylor, T.S. Koloski, and J.M. Calvert, *Journal of Vacuum Science Technology B*, 11(6):2850-2854 (1993).



"Lithographic Patterning of Self-Assembled Films", J.M. Calvert, *Journal of Vacuum Science and Technology B*, 11(6):2155-2163 (1993).

"Comparative Electrophysiological Properties of NG108-15 Cells in Serum-Containing and Serum-Free Media", V.C. Kowtha, J.N. Quong, H.J. Bryant, and D.A. Stenger, *Neuroscience Letters*, 164:129-133 (1993).

"Internalization Of Oligodeoxyribonucleotides By Vibrio Parahaemolyticus", L.A. Chrisey, S. Walz, J.R. Campbell, and M. Pazirandeh, *Antisense and Research Development*, 3:367-381 (1993).

"Simulated Annealing as a Method of Deconvolution for Acoustic Transients Measured on a Vertical Array." James F. Smith, III and Steven Finette, *J. Acoust. Soc. Am.* 94, 2315-2325, (1993).

"Broadband Source Signature Extraction Using a Vertical Array." Steven Finette, Peter C. Mignerey, James F. Smith, III, and Christ D. Richmond, *J. Acoust. Soc. Am.* 94, 309-318, (1993).

"Very Low Frequency Under-Ice Reflectivity." J.W. Wolf, O.I. Diachok, T.C. Yang, S. Wales, and R. Dicus, *J. Acoust. Soc. Am.* 93(3), 1329-1334, March 1993.

"Experimental Results on the Automated Detection of Aircraft over the Calendar Year 1991." E.L. Kunz, A.A. Gerlach, and K.D. Flowers, *U.S. Navy Journal of Underwater Acoustic* 43(1) January 1993.

"Broadband Source Signature Extraction Using a Vertical Array." S.I. Finette, P.C. Mignerey, J.F. Smith, C.D. Richmond, *J. Acoust. Soc. Am.*, 94(1), pp. 309-318, July 1993.

"Linearly Configured Embedded Fiber-Optic Acoustic Sensor", N. Lagakos, and J. A. Bucaro, *Journal of Lightwave Technology*, Vol. 11, No. 4 Apr 1993.

"The Design of a Three Dimensional Laser Vibrometer", Joseph F. Vignola, and Brian H. Houston, Accepted Aug., *ASME Journal of Vibration and Acoustics*, 1993.

"An Iterative Solution Schemed For The Exterior Neumann Problem For  $D+K^2$  Using Finite Elements In A Bounded Domain." Joseph J. Shirron, *J. Acoust. Soc. Am.* 94(2), Pt. 1, August 1993.

"T-Matrix implementation of Forward Scattering from Rigid Structures." A. Sarkissian, C. F. Gaumond, and L. R. Dragonette, *J. Acoust. Soc. Am.* (In Press), Nov. 1993.

"Localization Of Helical Flexural Waves On An Irregular Cylindrical Shell." D. M. Photiadis, *Structural Dynamics of Large Scale Complex and Systems*, Vol. DE-59, pp. 15-26, ASME, 1993.

"Approximations For The 2-D Green's Function Of A Fluid-Loaded Plate." D. M. Photiadis *J. Acoust. Soc. Am.* 93, 1, Jan 1993.

"Complex Wave-Number Decomposition Of Structural Vibrations." Karl Grosh, Earl G. Williams, *J. Acoust. Soc. Am.*, 93, 836-848 (1993).

"Inversion of Low-Frequency Subsurface Data in a Finite-Depth Ocean." L. Couchman, D. N. Gosh Roy, and A. G. Ramm, accepted for publication in *Appl. Math. Lett.* 1993.

"Scattering From A Rigid Target In Shallow Water," Angie Sarkissian, J. Acoust. Soc. Am. 93, p 2301 (1993).

"Determination of Structural Impedance from Scattering Data," Charles F. Gaumond, Angie Sarkissian, Earl G. Williams, and Timothy J. Yoder, J. Acoust. Soc. Am 93 p 2413 (1993).

"Time Frequency And Thickness Analysis Of Monostatic Scattering From An Infinite Steel Cylindrical Shell Immersed In Water," Timothy Yoder, Louis R. Dragonette, and Charles F. Gaumond, J. Acoust. Soc. Am. 94, p. 1824, (1993).

"Time-Frequency Representation Of Scattering From A Target In A Bounded Medium," Angie Sarkissian, Charles F. Gaumond, and Timothy J. Yoder, J. Acoust. Soc. Am. 94 p 1824 (1993).

"Decomposition Of Scattered Waves From An Isolated Elastic Object With Time-Frequency Representation," Nai-Chyuan Yen, J. Acoust. Soc. Am. 94, p 1823. (1993) .

"Multiple Scattering Effects In Scattering From A Target In Shallow Water," Angie Sarkissian, J. Acoust. Soc. Am. 94, p 1784, (1993).

"General Expressions for Rician Density and Distribution Functions," D.M. Drumheller, IEEE Transactions on Aerospace and Electronic Systems; AES 29(2), pp. 580-588, April 1993.

"Applications of Optimal Time-Domain Beamforming," M.D. Collins, J.M. Berkson, W.A. Kuperman, N.C. Makris, J.S. Perkins, J. Acoust. Soc. Am.; 93(4), Pt. 1, pp. 1851-1865, April 1993.

"A Two-Way Parabolic Equation for Elastic Media," M.D. Collins, J. Acoust. Soc. Am.; 93(4), Pt. 1, pp. 1815-1825, April 1993.

"A Split-Step Pade Solution for the Parabolic Equation Method," M.D. Collins, J. Acoust. Soc. Am.; 93(4), Pt. 1, pp. 1736-1742, April 1993.

"Low-Frequency Scattering from Intermediate Bubble Plumes: Theory and Computational Parameter Study," R.G. Gragg, D. Wurmser, J. Acoust. Soc. Am.; 94(1), pp. 319-329, July 1993.

"Modeling Ambient Noise in Three-Dimensional Ocean Environments," J.S. Perkins, W.A. Kuperman, F. Ingenito, L.S. Fialkowski, J. Glattetre, J. Acoust. Soc. Am.; 93(2), pp. 739-752, February 1993.

"Environmental Source Tracking," M.D. Collins, L.T. Fialkowski, W.A. Kuperman, J.S. Perkins, J. Acoust. Soc. Am.; 94(6), pp. 3335-3341, December 1993.

"The Adiabatic Mode Parabolic Equation," M.D. Collins, J. Acoust. Soc. Am.; 94(4), pp. 2269-2278, October 1993.

"Imaging Ocean-Basic Reverberation Via Inversion," N.C. Makris, J. Acoust. Soc. Am.; 94(2), Pt. 1, pp. 983-993, August 1993.

"An Energy-Conserving Parabolic Equation for Elastic Media," M.D. Collins, J. Acoust. Soc. Am.; 94(2), Pt. 1, pp. 975-982, August 1993.

"Modeling Global-Scale Three Dimensional Sound Propagation in the Ocean with the Parabolic Equation Method," M.D. Collins, B.E. McDonald, W.A. Kuperman, and K.D. Heaney, J. Acoust. Soc. Am.; 93, 2321, 1993.

"Comparison of Data and Parabolic Equation Solutions for Long Range Pulse Propagation," K.D. Heaney, W.A. Kuperman, B.E. McDonald, and M.D. Collins, J. Acoust. Soc. Am.; 93, 2426, 1993.

"Using Circulation Models to Improve Ocean Imaging (and Vice Versa)," W.A. Kuperman, C. Shen, and M. Porter, J. Acoust. Soc. Am.; 94, 2400, 1993.

"Effect of Microbubbles on Self Similar Waterborn Shocks," B.E. McDonald, J. Acoust. Soc. Am.; 94, 1802, 1993.

"Effects of Perturbations on Long Range Propagation," W.A. Kuperman, M.D. Collins, B.E. McDonald, and K.D. Heaney, J. Acoust. Soc. Am.; 94, 1802, 1993.

"Modal Eigenfunction Perturbations and Group Speed Tomography," B.E. McDonald, A.B. Baggeroer, J. Acoust. Soc. Am.; 94, 1794, 1993.

"Positions and Distributions of Water Masers Around Late-Type Stars", P.F. Bowers, M. Claussen, K.J. Johnston, AJ, 105, 284, 1993.

"Discontinuities in the Dynamic Spectrum of the Pulsar 0823+26", A.W. Clegg, R.L. Fiedler, J.M. Cordes, ApJ, 409, 691, 1993.

"The Out-of-plane Distribution of Zodiacal Dust Near the Earth", J.P. Kennealy, P.V. Noah, G.A. Gladell, M. Cobb, F.O. Clark, M.V. Torbett, A.A. Jackson, S.D. Price, AJ, 105, 976, 1993

"608 MHz VLBI Observations of the Compact Double Radio Source 2050+364: Constraints on Interstellar Scattering", A.L. Fey, R.L. Mutel, ApJ, 404, 197, 1993.

"Daily Spectra of Radio Flares from SS 433 in May/June 1987," R.C. Vermeulen, W.B. McAdam, S.A. Truskin, S.R. Facondi, R.L. Fiedler, R.M. Hjellming, K.J. Johnston, J. Corbin, A&A, 270, 189V, 1993.

"Temporal Variations of Pulsar Dispersion Measures", D.C. Backer, S. Hama, S. Van Hook, R.S. Foster, ApJ, 404, 636, 1993.

"A Second Companion of the Millisecond Pulsar 1620-26", D.C. Backer, R.S. Foster, S. Sallmen, Nature, 365, 817, 1993.

"A New Binary Millisecond Radio Pulsar", R.S. Foster, A. Wolszczan, F. Camilo, ApJ Letters, 410, L91, 1993.

"High-Resolution Centimeter Radio Continuum and Ammonia Maser Observations of the W51 Region of Star Formation", R.A. Gaume, K.J. Johnston, T. Wilson, ApJ, 417, 645, 1993.

"Stimulated Radio Recombination line Emission at  $\lambda$ 1.3-cm toward MWC 349", J. Martin-Pintado, R.A. Gaume, R. Bachiller, K.J. Johnston, P. Planesas, ApJ Letters, 418, L79, 1993.

"The 150 AU Structure of the Radio Continuum and the Ammonia Bipolar Outflow in CRL 618", J. Martin-Pintado, R.A. Gaume, R. Bachiller, K.J. Johnston, ApJ, 419, 725, 1993.

"IRC + 10420 - A Cool Hypergiant Near the Top of the H-R Diagram", T.J. Jones, R.M. Humphreys, R.D. Gehrz, G.F. Lawrence, F. Zickgraf, H. Moseley, S. Casey, W.J. Glaccum, C.J. Koch, R. Pina, ApJ, 411, 323, 1993.

"The Interaction-Activity Connection II: Radio Observations", E.P. Smith, N.E. Kassim, Astronomical J., 105, 46, 1993.

"The Gamma Ray Line of  $^{44}\text{Ti}$ . Combined with Radio Observations, as a Probe of Supernovae", R. Silberberg, R.A. Cameron, C.H. Tsao, N.E. Kassim, K.W. Weiler, Adv. Space. Res., 13, 747, 1993.

"ROSAT Observations of the Composite SNR G326.3-1.8", N.E. Kassim, P. Hertz, K.W. Weiler, Astrophys. J., 419, 733, 1993.

"Subarcminute Resolution Imaging of Radio Sources at 74 MHz with the VLA", N.E. Kassim, R.A. Perley, W.C. Erickson, K.S. Dwarakanath, Astronomical J., 106, 2218, 1993.

"Angular Diameter Measurements of Cool Giant Stars in Strong TiO Bands and in the Continuum", A. Quirrenbach, N.M. Elias, D. Mozurkewich, J.T. Armstrong, D.F. Buscher, C.A. Hummel, ApJ, 406, 215, 1993.

"Observations of Nova Cygni 1992 with a Long Baseline Optical Interferometer", A. Quirrenbach, N.M. Elias, D. Mozurkewich, J.T. Armstrong, D.F. Buscher, C.A. Hummel, AJ, 106, 1118, 1993.

"The Spectroscopic Binary ETA Andromedae: Determination of the Orbit by Optical Interferometry", C.A. Hummel, J.T. Armstrong, A. Quirrenbach, D.F. Buscher, D. Mozurkewich, R.S. Simon, K.J. Johnston, "AJ, 106, 2486, 1993.

"Optical Lines in High-Redshift Quasi-Stellar Objects - Balmer Lines, Forbidden O III, and Fe II", G.J. Hill, K.L. Thompson & R. Elston, ApJ, 414L, 1, 1993.

"The Radio Emission from the Type Ic Supernova SN1990B", S.D. Van Dyk, R.A. Sramek, K.W. Weiler, N. Panagia, Astrophys. J., 409, 162, 1993.

"SN1988Z: The Most Distant Radio Supernova", S.D. Van Dyk, K.W. Weiler, R.A. Sramek, N. Panagia, Astrophys. J. Letters, 419, L69, 1993.

"Positions and Distributions of Water Masers Around Late-Type Stars", P.F. Bowers, M.J. Claussen, K.J. Johnston, AJ, 105, 284, 1993.

"Pumping of Main Line OH Masers in the Circumstellar Envelopes of Type I Mira Variables", A.L. Collison, G. Nedoluha, ApJ, 413, 735, 1993.

"Scattering of a Light Beam from Waves at an Air-Sea Interface", W.H. Carter, D.D. Duncan, Applied Optics, 32, 3286, 1993.

"Coherence Properties of Some Broadband Highly Coherent Light Fields", W.H. Carter, J. Opt Soc Amer A, 10, 1570, 1993.

"A Wave Theory for Non-Imaging Concentrators", W.H. Carter, J. Modern Optics, 40, 1801, 1993.

"On Some Diffraction Efficiency Equations for a Thick Grating or Hologram", W.H. Carter, Opt Comm, 1993.

"A Study of the Propagation of Optical Spectra Using a Wavelength Independent Formulation of Diffraction Theory and Coherence Theory", W.H. Carter, J. Modern Optics, 1993.

"An IRAS Survey of Star-Forming Regions Toward Cygnus", S. Odenwald, P.R. Schwartz, ApJ, 405, 706, 1993.

"Application Of Vertical Mode Initialization To The Nrl Limited Area Model." Sashegyi, K. and R.V. Madala, Mon. Weather Rev., Vol 121, 207-220, 1993.

"Application Of Bratseth Scheme For The Analysis Of Gale Data Using A Mesoscale Model." Sashegyi, K. R.V. Madala, D.E. Harms and S. Raman, Mon. Weather Review., Vol 121, 2331-2350, 1993.

"Investigation Of The Role Of The Boundary Layer Processes In An Active Monsoon Using A Mesoscale Model." Madala, R.V., K. Alapati and S. Raman, Accepted for publication in publication to Jour. of Geophy. Research, 1993.

"Initialization And Boundary Conditions." Madala, R.V. and K. Sashegyi, 1 Accepted for publication to Meteorological monograph. In press, 1993.

"Diabatic Initialization Tests Using The Nrl Limited Area Model." Harms, D.E., R.V. Madala, S. Raman and K. Sashegyi, Mon. Weather Review, Vol 121, 3184-3190, 1993.

"Sensitivity of Monsoon Rainfall Predictions to Initialization Procedures." Alapati, K., R.V. Madala and S. Raman, Accepted for Publication in Atmos. Research. April 1993.

"Monsoon Rainfall Simulations with the Kuo and Betts-Miller Schemes." Alapati, K., S. Raman, R.V. Madala and U.C. Mohanty, Accepted for Publication in Meteorology and Atmos. Physics journal. March 1993.

"Numerical simulation of orographic-convective rainfall with Kuo and Betts cumulus parameterization schemes." Alapati, K, R.V. Madala, S. Raman and J.J. Baik. Submitted to Journal of Meteorology and Geophysics. Accepted for publication in July 1993.

"Sensitivity of Monsoon Circulations to Changes in the Sea Surface Temperatures." Alapati, K., S. Raman, U.C. Mohanty and R.V. Madala: Submitted to Atmospheric Environment: March 1993. Accepted for publication in August 1993.

"A numerical investigation of the effects of the timing of diabatic processes in the coastal cyclogenesis of GALE IOP 2." Holt, T. R. and S. W. Chang, Mon. Wea. Rev., 121, 1007-1029, 1993.

"Ssm/I Observations Of Erica Iop 4 Marine Cyclone: A Comparison With In Situ Observations And Model Simulations." Chang, S.W., R.J. Alliss, J.-J. Shi, and S. Raman, Mon. Wea. Rev., 121, 2452-2464.

"Application Of ssm/I Data In The Analysis Of Hurricane Florence (1988)." Alliss, R.J., G.D. Sandlin, S.W. Chang, and S. Raman, Jour. Appli. Meteor. , 32, 1581-1591, 1993.

"Applications of SSMI/I Data in the Analysis of Hurrican Florence", G. Sandlin, S. Raman, and S. Chang, J. of Applied Meteorology, 1993.

"Vortex Shedding and Lock-On in a Perturbed Flow", M.S. Hall and O.M. Griffin, Transactions of the ASME, Journal of Fluids Engineering, Vol. 115, 283-291, June 1993.

"Suppression of Short Sea Waves in Ship Wakes-Measurements and Observations", J. H. Milgram, R.D. Peltzer and O. M. Griffin, Journal of Geophysical Research (Oceans), Vol. 98, No. C4, 7103-7114, 1993.

"Modeling Short Sea Wave Energy Distribution in the Far Wakes of Ships", J. H. Milgram, R.A. Skop, R.D. Peltzer and O.M. Griffin, Journal of Geophysical Research (Oceans), Vol 98, No. C4, 7115-7125, 1993.

"Vortex Shedding and Lock-On in a Perturbed Flow", O.M. Griffin and M.S. Hall, ASME Fluids Engineering 1992-Abstracts, FED Vol. 133, 81-82, June 1993.

"Spatial and Temporal Properties of Deep Water Breaking Waves", R.D. Peltzer and O.M. Griffin, Bulletin of the American Physical Society, Vol. 37(10), 1713 (1993).

"Vortex-Induced Vibrations of Marine Structures in Uniform and Sheared Flows", O.M. Griffin, Proceedings of the NSF Workshop on Riser Mechanics, University of Michigan, pp. 293-316, M. Bernitsas (Ed.), 1993.\*

"Accuracy of Low Order Models for Simulations of Random Ocean Waves", H.T. Wang and J.D. Crouch, Journal of Waterway, Port, Coastal, and Ocean Engineering (JWPCOE), Vol. 119, No. 1, Jan/Feb 1993, pp. 70-87.

"Approximate Solutions for Cables under Generalized Hydrodynamic Loading", H. T. Wang, JWPCOE, Vol. 119, No. 3, May/June 1993, pp. 274-288.

Discussion of "Nonlinear Computations of Ship Waves and Wave Resistance", H.T. Wang and S.K. Chakrabarti, accepted for publication in Proceedings of the Sixth International Conference on Numerical ship Hydrodynamics (6th ICNSH), August 1993.\*

"Discussion of "Rankine Source Method in High Speed Range", H. T. Wang, accepted for publication in Proceedings of the 6th ICNSH, August 1993.\*

"Discussion of "Numerical Analysis of Nonlinear Ship Wavemaking Problem by the Coupled Element Method", H.T. Wang, accepted for publication in Proceedings of the 6th ICNSH, August 1993.\*

"Discussion of "Panel-Convergence of Steady Free-Surface Flow Calculations", H.T. Wang, accepted for publication in Proceedings of the 6th ICNSH, August 1993.\*

Error analysis of ClO<sub>2</sub>, O<sub>3</sub>, and H<sub>2</sub>O abundance profiles retrieved from mm-wave limb sounding measurements, Aellig, C.P., N. Kaempfer, and R.M. Bevilacqua, J. Geophys. Res., 98, 2975-2983, 1993.

"Statistical Inference for Quantum Systems", James D. Malley and John Hornstein, invited paper, Statistical Science 8(4), 433-457 (November, 1993).

1993: Vortex dynamics and the production of Reynolds Stress. Bernard, P.S., Thomas, J.T. and Handler, R.A., Journal of Fluid Mechanics, v. 253, pp. 385-419.

1993: Vortex dynamics in near wall turbulence. Bernard, P.S., Thomas, J.T., and Handler, R.A., Proceedings of the International Symposium on Near-Wall Turbulence, pp. 43-52, Tempe, Arizona.\*

"Radar Surface Signatures for the Two-Dimensional Tidal Circulation over Phelps Bank, Nantucket Shoals: A Comparison between Theory and Experiment. Journal of Geophysical Research, Oceans." Cooper, A.L., Chubb, S.R., Valenzuela, G.R., Askari, F., Bennett, J.R., and Keller, W.C., accepted for publication November 1993.

" Modeling A No-Slip Flow Boundary With An External Force Field." Goldstein, D.B., Handler, R.A., and Sirovich, L., Journal of Computational Physics, v. 105, 354-366.

"Length Scales And Energy Balance For Turbulence Near A Free Surface." Handler, R.A., Swean, T.F., and Leighton, R.I., Swearingen, J.D., AIAA Journal, v. 31, pp. 1988-2007..

"Turbulent Drag Reduction By Phase Randomization." Handler, R.A., Sirovich, L. and Levich, E., Physics of Fluids A, 3, pp. 686-694.

"An Experimental Investigation of a Non-Newtonian Turbulent Flow In a Smooth-Wall Rectangular Channel Via The Wall Pressure Field", Horne, M.P. and Hendricks, E.W., Physics of Fluids (in Review).

"Evolution Of Hairpin Vortices In A Mixed Boundary Corner Flow." Karn, E.L., Wei, T., Neves, J.C. and Leighton, R.I., to appear, Proceedings of the ASME Fluids Engineering Conference, Washington, DC.\*

"Spplcation Of Non-Traditional Processing Methods To Transitional And Turbulent Boundary Layer Flow Noise. To Appear In International Conference On Theoretical And Computational Acoustics." Katz, R., Keith, W., Galib, T., and Handler, R.A..

"Tests Of Random Flight And Closure Models In Predicting Turbulent Scalar Transport." Handler, R.A., Bernard, P.S., Rovelstad, A.L., Pan American Congress of Applied Mechanics, Sao Paulo, Brazil, pp. 76-679.\*

"A Salinity Front And Current Rip Near Cape Hatteras." USA. Marmorino, G.O. and Trump, C.L., Journal of Geophysical Research, accepted.

"The Limit Of Wavy Motion On The Free Surface Of A Viscous Fluid." McHugh, J.P., Bedford, F.C. and Leighton, R.I., Journal of Applied Mechanics, to appear 1993.

"Implications Of Lagrangian Transport Analysis For Large Eddy Simulations. To Appear." Proceedings of the ASME Fluids Engineering Conference, Rovelstad, A.L., Handler, R.A., and Bernard, P.S., Washington, DC.\*

"Heat/Salt Finger Fluxes Across A Density Interface." Shen, C.Y., Physics of Fluids A, A (s) 2633-2643

"The Acceleration Field Associated With Vorticity Flux Convergence." Shen, C.Y., Journal of Physical Oceanography (accepted).

"Dynamics Of Coherent Structures In Wall-Bounded Turbulence. In Research Trends In Physics: Chaotic Dynamics And Transport In Fluids And Plasmas." Sirovich, L., Ball, K.S., and Handler, R.A., edited by I. Prigogine, et al. (A.I.P., New York, 1993), pp. 149-170.

"Modeling and Computation of Turbulent Free-Surface Jets, accepted for presentation at the AIAA 31st Aerospace Sciences Meeting and Exhibit." Swean, T.F., Jr., Miner, E.W., and Stewart, M.B., Reno, Nevada, January 1993.

"Bubble Dynamics and Acoustic Attenuation in Turbulent Ship Wakes, submitted for presentation at the 6th International Conference on Numerical Ship Hydrodynamics," Wang, H.T., Miner, E.W. and Stewart, M.B., 1993, Iowa City, Iowa, August 1993.

"The Arctic Sea Sea-Climate System: Observations And Modeling," Barry, R.G., M.C. Sereze, J.A. Maslanik, and R.H. Preller, 1993, Reviews of Geophysics, 31,4, pp 397-422.

"Five Years' Central Pacific Sea Level From In-Situ Array, Satellite Altimeter, And Numerical Model," Atmospheric-Ocean, Donohue, K.A., M. Wimbush, X. Zhu, S.M. Chiswell, R. Lukas, L. Miller, and H.E. Hurlburt, 1993, (accepted for publication).

"Wind-Driven Secondary Circulation In Ocean Mesoscale," Lee, D.K., P. Niiler, A. Warn-Varnas, and S.A. Piacsek, 1993, J. Mar.Res., (accepted)

"A Numerical Study Of The Circulation Of The Bering Sea Basin And Exchange With The North Pacific Ocean," Overland, J.E., M.C. Spillane, H.E. Hurlburt, and A.J. Wallcraft, 1993: J. Phys. Oceanogr. (in press).

"Specifying Salinity And Deep Temperature Fields For The Use Of Axbt Data In Diagnostic Ocean Models," Thessalographica (accepted), Piacsek, S.A. and R.A. Allard, 1993.

"On The Effects Of Horizontal Resolution In A Limited-Area Model Of The Gulf Stream System," Schmitz, W.J., Jr., and J.D. Thompson, 1993: J. Phys. Oceanogr., Vol. 23, No. 5, pp. 1001-1007.

"Sea-Surface Height Fluctuations Observed Simultaneously with Inverted Echo Sounders and GEOSAT," Hallock, Zachariah R. and William J. Teague (1993). J. Geophys. Res. 98(9) pp16341-16349.

"Continental Shelf Research," (Lavoie, Dennis, A.W. Green, I.P. DePalma, and D.K. Young (1993). The Influence of the Norwegian Coastal Current on the Hydrography of Vestfjord, Norway in October 1969. In Revision).

"Bubble Size Distribution Under Saltwater and Freshwater Breaking Waves. Dynamics of Atmospheres and Oceans," Cartmill, J.W. and Ming Yang Su, 20 pp 25-31. 1. Orr, C. W., Thiele, M. G., Johnson, Walter C., and Small, DC., "NRL Acoustic Array Systems," Sea Technology, p. 37, March 1993.

"Sediment Patterns Within the Trough Separating the Tunisian and Sicilian Platforms. Proc. Of International Scientific Meeting," Bowles, F.A., D.N. Lambert, and M.D. Richardson, Urbino, Italy, UNESCO Reports in Marine Science 58, Proceedings. 1993.\*

"Outcropping Pre-Pliocene Strata In The Strait Of Sicily. Proc. Of International Scientific Meeting," Bowles, F.A. And P. Fleischer, Urbino, Italy, UNESCO Reports In Marine Science 58, Proceedings. 1993.\*

"Development of a Geological-Geophysical Database for the Strait Of Sicily: Southwestern Offshore Italy. Proc. Of International Scientific Meeting," Fleischer, P., W.B. Sawyer, and F.A. Bowles, Urbino, Italy, UNESCO Reports In Marine Science 58, Proceedings. 1993.\*

"Bathymetry and Geological Terranes in the Norwegian, Greenland and Barents Seas." Cherkis, N.Z., Max, M.D, T.O. Vorren, E. Bergsager, O.A. Dahl-Stamnes, B. Johansen, E. Lie and T.B.



Lund, (eds), Arctic Geology and Petroleum Potential, Proc. Norw. Petrol. Soc. Conf., 15-17 August 1990, Elsevier Sci. Publ. Amsterdam. Proceedings.1993.\*

"Aerogeophysical Evidence For Active Volcanism Beneath The West Antarctic Ice Sheet." Nature, Blankenship, D.D., R.E. Bell, S.M. Hodge, J.M. Brozena, J.C. Behrendt, C. Flinn, 361,526-529, 1993.

"Aerogeophysical Evidence For Active Volcanism Beneath The West Antarctic Ice Sheet." Nature, Blankenship, D.D., R.E. Bell, S.M. Hodge, J.M. Brozena, J.C. Behrendt, C. Flinn, 361,526-529, 1993.

"New Technology Allows Remote Areas To Be Probed," Brozena, J.M., M. Chalona, R. Forsberg, and G. Mader, EOS Trans. AGU 74, 18, 1993.

"Airborne Measurement of Absolute Sea-surface Heights." Brozena, J.M., M.F. Peters and R. Forsberg, Geophys. Res. Lett., 20, 875-878, 1993.

"Glacigenic Mudflows on the Bear Island Submarine Fan." EOS, Vogt, P.R., K. Crane and E. Sundvor, Trans. AGU 74, 449, 452-453. 1993.

"Paleomagnetism of Japanese and Marcus-Wake Seamounts, Western Pacific Ocean. The Mesozoic Pacific: Geology, Tectonics, and Volcanism." Sager, W.W., R. Duncan, and D.W. Handschumacher, AGU Monograph 77. 1993.

"The Fine Structure Of Methane Hydrate-Bearing Sediments On The Blake Outer Ridge Determined from Deep-Tow Multichannel Seismic Data." Rowe, M.M., and J.F. Gettrust, JGR-B, V. 98, p. 463-473, 1993.

"Faulted Structure of the Bottom Simulating Reflector on the Blake Ridge." Rowe, M.M., and J.F. Gettrust, Geology, V. 21, p. 833-836, 1993.

"The Fine Structure of Methane Hydrate-Bearing Sediments on the Blake Outer Ridge Determined from Deep-Tow Multichannel Seismic Data." Rowe, M.M., and J.F. Gettrust, JGR-B, V. 98, p. 463-473, 1993.

"The Influence of a Thin Sediment Layer on the Dispersion of Scholte Interface Waves." Ali, H.B. and L. Dale Bibee, Acoustic Letters, 17(1), p. 13-18., 1993.

"Spatial Data Exchange Standards: Springboard to the Future or Fetter to the Past?." Burgess, C., Computers & Geosciences, Vol. 19, No. 1, pp. 89-93, 1993.

"Acoustical Boundary Location through Texture Analysis of Multibeam Bathymetric Sonar Data." Barad, H., MTS Journal, Vol. 27, No. 1, Spring 1993.

"Spatial Data Exchange Standards: Springboard to the Future or Fetter to the Past?." Estep, L., Burgess, C., Computers & Geosciences, Vol. 19, No. 1, 1993.

"A Review of Airborne Lidar Hydrographic (ALH) Systems." Hydrographic Journal No. 67 January 1993.

"Relationships between Surface Chlorophyll and Solar Irradiance in the North Atlantic", Terrie, G.MTS Journal, Vol. 27, No. 1, Spring 1993.

"High-Frequency Bistatic Reverberation from a Smooth Ocean Bottom." S. Stanic, E. Kennedy and R.R. Ray, JASA, Vol. 93, No. 5, pp 2633-2638, May 1993.

"Reverberation Fluctuations from a Smooth Seafloor." S. Stanic and E. Kennedy, IEEE, Vol. 18, No. 2, pp 95-99, April 1993.

"Modeling Bistatic Bottom Scattering Strength Including a Forward Scatter Lobe." J. Caruthers and J.C. Novarini, IEEE, J. of Oceanic Eng., Vol. 18, No. 2, April 1993.

"Performance Stability of High-Resolution Matched-Field Processors to Sound Speed Mismatch in a Shallow-Water Environment." G.B. Smith, H.A. Chandler and C. Feuillade, J. Acoust. Soc. Am.; 93 (5), May 1993.

"Measurements of Bottom-Limited Ocean Impulse and Comparisons with the Time-Domain Parabolic Equation." B. Field and J.H. Leclere, J. Acoust. Soc. Am.; 93 (5), pp 2599-2616, May 1993.

"Sensitivity of the Deconvolution of Acoustic Transients to Green's Function Mismatch." M.K. Broadhead, R.L. Field and J. Leclere, J. Acoust. Soc. Am.; 94 (2), pt. 1, August 1993.

"Time-Delay Estimation for Deterministic Transients Using Second and Higher-Order Correlations." L. Pflug, G. Ioup, J. Ioup, R. Field and J. Leclere, JASA; 94, (3), pt. 1, pp 1385-1399, September 1993.

"Sampling Requirements and Aliasing for Higher-Order Correlations." L. Pflug, G.E. Ioup and J.W. Ioup, JASA; 94, (4), pp 2159-2172, October 1993.

"Oceanographic Variability in Shallow-Water Acoustics and the Dual Role of the Sea Bottom." A. Hassan, IEEE, Journal of Engineering, Vol. 18, No. 1, pp 31-41, January 1993.

"A Comparison of Volume Scattering Strength Data with Model Calculations Based on Quasi-Synoptically Collected Fisheries Data." R. Love, JASA; 94, (4), pp 2255-2268, October 1993.

"A Computerized System for Assessing Towed Array Sonar Functionality and Detecting Faults." R.A. Wagstaff, IEEE, Vol. 18, No. 4, pp 529-542, October 1993.

"The Influence of a Thin Sediment Layer on the Dispersion of Scholte Interface Waves." H.B. Ali and L.D. Bibee, Acoustic Letters, Vol. 17, No. 1, 1993.

"Physical Optics Approximations to Forward Scattering by Elastic Spherical Shells and Rigid/Soft Spheres." J. George and M.F. Werby, Acoustic Letters, Vol. 17, No. 1, pp 6, 1993.

"The Gamma Ray Line Of 44ti. With Radio Observations. As A Probe Of Supernovae", Tsao, C. H.(Dr), Silberberg, Rein (Dr), K. W. Weiler, N.E. Kassim., R. Cameron, The World Space Congress (Book Of Abstra, Vol. 13 #12, Pp. 747-750, December, 1993.

"Near Earth Space. A Historical Perspective", Friedman, Herbert (Dr), The Behavior Of Sys. In The Sp. Env., Pp. 1-22, December, 1993.

"The Compton Gamma Ray Observatory", Kurfess, James D.(Dr), C. Fichtel, G. Fishman, V. Schoenfelder, N. Gehrels, Scientific American, Vol. 269, Pp. 68-77, December, 1993.

"Flare Plasma Dynamics Observed With The Yohkoh Bragg Crystal Spectrometer. I. Properties Of The Ca XIX Resonance Line", Doschek, George A.(Dr), Mariska, John T.(Dr), Bentley,E.D., Astrophysical Journal, Vol. 419, Pp. 418-425, December, 1993.

"Blaze Considerations For Multilayer Gratings - Some Comments", Seely, John F.(Dr), Hunter,W.R., Optics Communication, Vol. 104, Pp. 139-140, December, 1993.

"The 5 January 1992 Flare At 13.3 Ut: Observations From Yohkoh", Doschek, George A.(Dr), Feldman, Uri (Dr), Brown, Charles M.(Dr), Mariska, John T.(Dr), Strong,K., Acton,L., Bruner,M., Bentley,R., Culhand,J., Fludra,A., Hiei,E., Watanabe,T., Hirayana,T., Land,J., Phillips,K., Pike, Sterling, Kosugi, Rolli, Yoshimori, Hudson, Metcalf, Wuelser, Uchida, Astrophysical Journal, Vol. 416, Pp. 845-856, October, 1993.

"A Search For Variable Emission At Mev Energies From Five Galactic And Extragalactic Sources", Share, Gerald H.(Dr), Grove, Jon Eric(Dr), Harris, Michael, M. D. Leising, Astrophysical Journal, Vol. 416, Pp. 601-619, October, 1993.

"High-Resolution Imaging Of Laser-Produced Plasmas At A Wavelength Of 130a Using A Normal Incidence Multilayer-Mirror Microscope", Seely, John F.(Dr), Holland, Glenn, Giasson,J.V., Applied Optics, Vol. 32 #31, Pp. 6294-6302, November, 1993.

"Implications Of The Soft X-Ray Versus Hard X-Ray Temporal Relationships In Solar Flares", Mariska, John T.(Dr), Li,P., Emslie,A.G., Astrophysical Journal, Vol. 417, Pp. 313-319, November, 1993.

"Gamma-Ray And Radio Observation Of Psr B1509-58", Kurfess, James D.(Dr), Kinzer, Robert L.(Dr), Johnson, Neil (Dr), Strickman, Mark S.(Dr), Grove, Jon Eric(Dr), Kaspi,V.M., Johnston,S., Manchester,R., Lyne,A.G., D'amico, Finger,M.J., Fishman,G.J., Grabelsky,D.A., Hagedon,K.S., Matz,S.M., Purcell,W.R., Ulmer,M.P., Wilson,R.B., Astrophysical Journal, Vol. 417, Pp. 738-741, November, 1993.

"A Cme Mass Distribution Derived From Solwind Coronagraph Observations", Howard, Russell A.(Dr), Jackson,B.V., Solar Physics, Vol. 148, Pp. 359-370, December, 1993.

"Abundances In The Upper Solar Atmosphere Of Quiet And Coronal Hole Regions (Te  $4.3 \times 10^5$  K)", Feldman, Uri (Dr), Widing, Kenneth G.(Dr), Astrophysical Journal, Vol. 414, Pp. 381-388, September, 1993.

"Understanding The Rotation Of Coronal Holes", Wang, Yi-Ming (Dr), Sheeley, Neil R.(Dr), Astrophysical Journal, Vol. 414, Pp. 916-927, September, 1993.

"Comparison Of Distributed Reacceleration And Leaky-Box Models Of Cosmic-Ray Abundances", Tsao, C. H.(Dr), Silberberg, Rein (Dr), J. R. Letaw, Astrophysical Journal, Vol. 414, Pp. 601-611, September, 1993.

"Highly Ionized Atoms: What Do They Teach Us About The Upper Solar Atmosphere", Feldman, Uri (Dr), Physica Scripta, Vol. T47, Pp. 128-132, October, 1993.

"Ultraviolet And X-Ray Detectors", Carruthers, George R.(Dr), Electro Optics Handbook, Vol. Ch. 15, Pp. 15.1--16.1, October, 1993.

"An Evaluation Of O<sub>2</sub> (B<sub>1</sub> G) As A Possible Source Of Oh And Odd-Nitrogen In The Stratosphere And Mesosphere", Siskind, David E. (Dr), Summers, Michael (Dr), Mlynczak,M.G., Geophysical Research Letters, Vol. 20 #19, Pp. 2047-2050, October, 1993.

"Non-Photospheric Abundances In A Solar Active Region", Feldman, Uri (Dr), Widing, Kenneth G.(Dr), Astrophysical Journal, Vol. 416, Pp. 392-397, October, 1993.

"Model For The High Energy Emission From Blazars", Dermer, Charles D. (Dr.), Astrophysical Journal, Vol. 416, Pp. 458-484, October, 1993.

"Model For The High Energy Emission From Blazars", Dermer, Charles D. (Dr.), Schlickeiser,R., Astrophysical Journal, Vol. 416, Pp. 458-484, October, 1993.

"Spartan 1 X-Ray Observations Of The Perseus Cluster: Iii. The Distribution Of Iron In The Intracluster Gas", Snyder, William A.(Dr), Fritz, Gilbert G., Kowalski, Michael P.(Dr), Cruddace, Raymond G.(Dr), E. E. Fenimore, M. P. Ulmer, Astrophysical Journal, Vol. 412, Pp. 489-503, August, 1993.

"An Instrument For Discrimination Between Orbital Debris And Natural Particles In Near-Earth Space", Gursky, Herbert (Dr), Tuzzolino,A.J., Simpson,J.A., Mckibben,R.B., Voss,H.D., Advances In Space Research, Vol. 13 #8, Pp. 133-136, August, 1993.

"Osse Observations Of Galactic 511 Kev Positron Annihilation Radiation: Initial Phase 1 Results", Kurfess, James D.(Dr), Kinzer, Robert L.(Dr), Johnson, Neil (Dr), Strickman, Mark S.(Dr), Grabelsky,D.A., Jung,G.V., Purcell,W.R., Ulmer,M.P, Astrophysical Journal, Vol. 413, Pp. L85-L88, August, 1993.

"Yohkoh Observations Of Plasma Upflows During Solar Flares", Doschek, George A.(Dr), Mariska, John T.(Dr), E. Hiei, Bentley,R, Bromage,B, Culhane, Fludra,A., Phillips, Pike,C., Sterling, Adv. In Space Research (Cospar), Vol. 13 #9, Pp. 303-306, September, 1993.

"Determination Of Coronal Abundances Of Sulphur, Calcium And Iron Using The Yohkoh Bragg Crystal Spectrometer", Doschek, George A.(Dr), Bentley,R.D, Culhane,J.L., Fludra,A., Hiei,E., Phillips,K.J., Sterling,A., Adv. In Space Research (Cospar), Vol. 13 #9, Pp. 395-398, September, 1993.

"Determining The Charge States Of Solar Energetic Ions During Large Geomagnetic Storms", Tylka, Allan J.(Dr), Adams, James H.(Dr), Tretyakova, Zhuravlev, Beaujean, Grigorov, Kondratyeva, Mason, Mcguire, Mewaldt, P. Boberg, Panasyuk, Advances In Space Research, Vol. 13 #9, Pp. 367-370, September, 1993.

"A Supersoft Variable Low Luminosity X-Ray Source In The Globular Cluster M3", Hertz, Paul (Dr), C. D. Bailyn, J. E. Grindaly, Astrophysical Journal, Vol. 410, Pp. L87-L90, June, 1993.

"Normal Incidence Reflection Of W/B4 C Multilayer Mirrors In The 34-50 A Wavelength Region", Seely, John F.(Dr), Kowalski, Michael P.(Dr), Wood, Kent S.(Dr), G. Gutman, J.C. Rife, J. Wood, W. R. Hunter, Applied Optics, Vol. 32 #19, Pp. 3541-3543, July, 1993.

"An Improved Ultraviolet Spectral Line List For The Symbiotic Star Rr Telescopii", Doschek, George A.(Dr), W. A. Feibelman, Astrophysical Journal Supplement, Vol. 87, Pp. 331-336, July, 1993.

"Highly Ionized Atoms In Space: Or Highly Ionized Atoms. What Are They Teaching Us About The Solar Coronal Heating Processes?", Feldman, Uri (Dr), Physica Scripta, Vol. T46, Pp. 34-43, July, 1993.

- "Atomic Data And Spectral Line Intensities For C-Like Nev", Doschek, George A.(Dr), Bhatia,A.K., Atomic Data And Nuclear Data Tables, Vol. 55, Pp. 315--, July, 1993.
- "Atomic Data And Spectral Line Intensities For C0like Si Ix", Doschek, George A.(Dr), A.K. Bhatia, Atomic Data And Nuclear Data Tables, Vol. 55, Pp. 281--, July, 1993.
- "Is It Justified To Assume That "Everywhere In The Sun's Photosphere Coronal Domain The Electric Conductivity Is High? Or What Drives The Solar Upper Atmosphere?", Feldman, Uri (Dr), Astrophysical Journal, Vol. 411, Pp. 896-908, July, 1993.
- "Far Ultraviolet Stellar Photometry: A Field In Monoceros", Carruthers, George R.(Dr), E. G. Schmidt, Astrophysical Journal, Vol. 408, Pp. 484-495, May, 1993.
- "Upper Limit On Titan's Atmospheric Argon Abundance", Summers, Michael (Dr), Strobel, Darrell, Hall,D.T, Zhu,K., Icarus, Vol. 103, Pp. 333-336, June, 1993.
- "The Oriented Scintillation Spectrometer Experiment Instrument Description", Kurfess, James D.(Dr), Kinzer, Robert L.(Dr), Johnson, Neil (Dr), Strickman, Mark S.(Dr), R. A. Cameron, D. A. Grablesky, D. A. Hillis, G. V. Jung, M. P. Ulmer, W. R. Purcell, Astrophysical Journal Supplement, Vol. 86, Pp. 693-712, June, 1993.
- "Atomic Transition Probabilities Of Fe Ii Lines Determined From Solar Emission Spectra: I. The 2000-2800 A Wavelength Range", Feldman, Uri (Dr), J. O. Ekberg, Astrophysical Journal Supplement, Vol. 86, Pp. 611-628, June, 1993.
- "Ar Xiii Line Ratios In Solar Flares", Widing, Kenneth G.(Dr), E. S. Conlon, F. P. Keenan, K. M. Aggarwal, V. J. Foster, Solar Physics, Vol. 145, Pp. 291-296, June, 1993.
- "Uv Prominences Observed With The Hrts: Structure And Physical Properties", Dere, Kenneth P.(Dr), B. Schmieder, J. E. Wiik, Astronomy & Astrophysics, Vol. 273, Pp. 267-286, June, 1993.
- "Flux-Tube Divergence, Coronal Heating, And The Solar Wind", Wang, Yi-Ming (Dr), Astrophysical Journal, Vol. 410, Pp. L123-126, June, 1993.
- "The Solar Ultraviolet Spectral Irradiance Monitor (Susim) Experiment On Board The Upper Atmosphere Research Satellite (Uars)", Brueckner, Guenter E.(Dr), Vanhoosier, Michael E., Lean, Judith (Dr), K. L. Edlow, L. E. Floyd, Journal Of Geophysical Research, Vol. 98 #D6, Pp. 10,695-10,711, June, 1993.
- "Properties Of Ultracompact Neutron Stars", Wood, Kent S.(Dr), P. A. Becker, R. J. Nemiroff, Astrophysical Journal, Vol. 406, Pp. 590-595, April, 1993.
- "Effect Of Oxygen Atom Bombardment On The Reflectance Of Sic Mirrors In The Extreme Ultraviolet Region", Dymond, Kenneth F.(Dr), Seely, John F.(Dr), Mccoy, Robert P.(Dr), Holland, Glenn, M. Corson, W. R. Hunter, Applied Optics, Vol. 32 #10, Pp. 1805-1810, April, 1993.
- "Nonthermal Velocities In The Solar Transition Zone Observed With The High Resolution Telescope And Spectrograph", Dere, Kenneth P.(Dr), H. E. Mason, Solar Physics, Vol. 144, Pp. 217-241, April, 1993.

"Osse Observations Of Ngc 4151", Kurfess, James D.(Dr), Kinzer, Robert L.(Dr), Johnson, Neil (Dr), Strickman, Mark S.(Dr), D. Grabelsky, G. Jung, D., M. Maisack, M. Ulmer, W. Purcell,, Astrophysical Journal, Vol. 407, Pp. L61-L64, April, 1993.

"Osse Observations Of Ngc 4151", Kurfess, James D.(Dr), Kinzer, Robert L.(Dr), Johnson, Neil (Dr), Strickman, Mark S.(Dr), D. Grabelsky, G. V. Jung, M. Maisack, Purcell, R. A. Cameron, Ulmer, Astrophysical Journal Letters, Vol. 407, Pp. L61-L64, April, 1993.

"Dual Waveband Operation Of A Multilayer-Coated Diffraction Grating In The Soft X-Ray Range At Near Normal Incidence", Seely, John F.(Dr), Seely, John F.(Dr), Brown, Charles M.(Dr), Kowalski, Michael P.(Dr), Cruddace, Raymond G.(Dr), Boyer, Craig (Dr.), Holland, Glenn, J. C. Rife, T. W. Barbee, W. R. Hunter, Applied Optics, Vol. 32 #13, Pp. 2422-2425, May, 1993.

"Far Ultraviolet Stellar Photometry: A Field In Orion", Carruthers, George R.(Dr), Schmidt,E.G., Astrophysical Journal, Vol. 408, Pp. 484-495, May, 1993.

"On The Absolute Abundance Of Calcium In Solar Flares", Doschek, George A.(Dr), Feldman, Uri (Dr), A. C. Sterling, Astrophysical Journal, Vol. 404, Pp. 394-402, February, 1993.

"A Burst Model For Line Emission In The Solar Atmosphere. A Reassessment Of The Assumptions Of Constant Pressure & Steady State Coronal Equilibrium In The Solar Transition Region", Feldman, Uri (Dr), Laming,J.M., Astrophysical Journal, Vol. 404, Pp. 799-804, February, 1993.

"A Scaling Algorithm To Calculate Heavy-Ion Spallation Cross Sections", Tsao, C. H.(Dr), Silberberg, Rein (Dr), Barghouty, Physical Review C, Vol. 47 #3, Pp. 1257-1262, March, 1993.

"Escape Of Photoelectrons: A Major Energy Resolution Degrading Mechanism In Thin Tunnel Junctions X-Ray Detectors", Vanvechten, Debbie (Dr), Wood, Kent S.(Dr), Applied Superconductivity Ieee Trans., Vol. 3 #1, Pp. 2096-- , March, 1993.

"The Correspondence Between X-Ray Bright Points And Evolving Magnetic Features In The Quiet Sun", Moses, J. Dan (Dr), D. F. Webb, J. W. Harvey, S. F. Martin, Solar Physics, Vol. 144, Pp. 15-35, March, 1993.

"Atomic Data And Spectral Line Intensities For Ne-Like Fe Xvii", Doschek, George A.(Dr), Bhatia,A., Atomic Data & Nuclear Data Tables, Vol. 53, Pp. 195-232, March, 1993.

"Identification Of The Fe Xv 3s 3p1 P - 3p2 1s Line In Solar Flare Spectra And Its Use As An Electron Density Diagnostic", Widing, Kenneth G.(Dr), A. E. Kingston, E. S. Conlon, F. P. Keenan, P. L. Dufton, V. J. Foster, Astrophysical Journal, Vol. 405, Pp. 798-800, March, 1993.

"Ultraviolet Remote Sensing Of The Middle And Upper Atmosphere", Carruthers, George R.(Dr), Journal Of The Nat. Tech. Assoc., Pp. 25-40, April, 1993.

"The Morphology Of 20 X 10<sup>6</sup> K Plasma In Large Solar Flares", Doschek, George A.(Dr), Feldman, Uri (Dr), H. S. Hudson, J. R. Lemen, K. T. Strong, L. W. Acton, M. E. Bruner, S. Tsuneta, T. Hirayama, Y. Ozawara, Astronomical Society Of Japan, Vol. 44, Pp. L71-L75, December, 1992.

"Composition, Propagation And Reacceleration Of Cosmic Rays", Tsao, C. H.(Dr), Silberberg, Rein (Dr), Rife,J.C., Particle Astrophysics And Cosmology, Pp. 1-16, January, 1993.

"Search For Gamma-Ray Transients Using The Smm Spectrometer", Share, Gerald H.(Dr), Harris, Michael, D. C. Messina, M. S. Leising, Astronomy & Astrophysics Supplement, Vol. 97, Pp. 341-344, January, 1993.

"Initial Results From Osse On The Compton Observatory", Share, Gerald H.(Dr), Kinzer, Robert L.(Dr), Kroeger, Richard (Dr), Strickman, Mark S.(Dr), Murphy, Ronald J. (Dr), Grove, Jon Eric(Dr), Ulmer,M, Cameron,R, Grabelsky, Jensen,C., Jung,G., Maisack,M, Matz,S, Purcell, Astronomy & Astrophysics, Vol. 97, Pp. 21-25, January, 1993.

"The He II 1640 A Multiplet Observed From Solar Prominences", Feldman, Uri (Dr), Laming,J.M., Astrophysical Journal, Vol. 403, Pp. 434-440, January, 1993.

"Electrochemical Patterning Of Amorphous Carbon On Diamond", Moses, J. Dan (Dr), Marchywka, Michael J., P. Pehrson, S. Binari, Journal Of Electrochemical Society, Vol. 140 #2, Pp. L19-L22, February, 1993.

"The Kelvin-Helmholtz Instability In Photospheric Flows: Effects On Coronal Heating And Structure", Karpen, Judith T.(Dr), Antiochos, Spiro K.(Dr), Dahlburg,R.B., Spicer,D.S, Astrophysical Journal, Vol. 403, Pp. 769-779, February, 1993.





d. Refereed Journals  
1994

"A Neural Network Approach to Solving the Link Activation Problem in Multihop Radio Networks", C. M. Barnhart, J. E. Wieselthier, and A. Ephremides, to appear in IEEE Transactions on Communications, 1994.

"A Resolution Of The N2 Carroll-Yoshino (C4' - X) Band Problem In The Earth's Atmosphere", Meier, Robert R.(Dr), Conway, Robert R. (Dr), Strobel, Darrell, Stevens,M.H., Journal Of Geophysical Research, Vol. 99 #A1, Pp. 417-434, January, 1994.

"The Magnetic Field Of Solar Prominences", Antiochos, Spiro K.(Dr), Klimchuk,J.A., Dahlburg, R.B., Astrophysical Letters, Vol. 420, Pp. L41-L44, January, 1994.

"The Magnetic Field Of Solar Prominences", Antiochos, Spiro K.(Dr), R.B. Dahlburg, J. A., 1994.

"Solar Coronal Abundances Of Elements With Low First Ionization Potential: Chromium, Calcium And Aluminum", Feldman, Uri (Dr), Mckenzie,D.L., Astrophysical Journal, Vol. 420, Pp. 892-902, January 1994.

"Smm Observations Of Gamma Ray Transients. Ii. A Search For Gamma Rlay Lines Between 400-600 Kev From The Crab Nebulae", Share, Gerald H.(Dr), Leising, M.D., Astrophysical Journal, Vol. 420, Pp. 649-654, January, 1994.

"On The Energetics And Number Of Gamma-Ray Pulsars", Dermer, Charles D. (Dr.), Sturmer,S.J., Astrophysical Journal, Vol. 420, Pp. L75-L78, January 1994.

"On The Spectra And Pulse Profiles Of Gamma-Ray Pulsars", Dermer, Charles D. (Dr.), Sturmer,S.J., Astrophysical Journal, Vol. 420, Pp. L79-L82, January, 1994.

"The Correleation Of Solar Flare Hard X-Ray Bursts With Doppler Blueshifted Soft X-Ray Flare Emission", Doschek, George A.(Dr), Mariska, John T.(Dr), R. D. Bentley, J. L. Culhane, G. M. Simnett, M. Rilee, T. Kosugi, T. Watanabe, Astrophysical Journal, Vol. 421, Pp. L55-L58, January, 1994.

"On The Location Of The Acceleration And Emission Sites In Gamma-Ray Blazers", Dermer, Charles D. (Dr.), R. Schlickeiser, Astrophysical Journal, Vol. 90, Pp. 945-948, February 1994.

"Very Impulsive Solar Flares Observed With The Yohkoh Spacecraft", Feldman, Uri (Dr), Brown, Charles M.(Dr), Hiei,E., Phillips,K., Lang,J., Astrophysical Journal, Vol. 421, Pp. 843-850, February 1994.

"Ne Vi Line Ratios In The Sun.", Widing, Kenneth G.(Dr), F. P. Keenan, E. S. Conlon, G. A. Warren, A. K. Prakhau, H. L. Zhang, D. H. Sampson, Ap. J., Vol. 421, Pp. 851-853, February, 1994.

"Fixed and Movable-Boundary Channel-Access Schemes for Integrated Voice/Data Networks", J. E. Wieselthier and A. Ephremides, to appear in IEEE Transactions on Communications, 1994.

\* Believed to be Peer-Reviewed.

"Direct Inverse Estimation for a Fluctuating Shallow Water Environment." R. Oba, Proceedings of Full Field Inversion Methods in Ocean & Seismic Acoustics, to be published in June 1994.\*

"The Effects of Irregular Bathymetry on Long-Range MFP Signal Performance: Theory and Experiment" J. F. Smith, III, R. Heitmeyer, O. Diachok and E. Livingston, in Proceedings of the 39th Naval Symposium on Underwater Acoustics, accepted, 1994.\*

"A Matched Field Comparison of Sound Speed Fields Using VAST Long Range Data" E. Livingston, R. Heitmeyer, O. Diachok and , J. F. Smith, III, in Proceedings of the 39th Naval Symposium on Underwater Acoustics, accepted, 1994.\*

"Summary of Regional Conflict Environmental Assessment Guide for the Arabian Sea." J.G. McDermid and D.M. Frilot, Proceedings of the 39th NSUA, to be published in June 1994.\*

"The Effect of Environmental Factors on the Potential for Fusion of Acoustic and Nonacoustic Signals in Shallow Water." W. Kinney, W. Avera, T. Perry and E. Mozley, Proceedings of the 39th NSUA, to be published in June 1994.\*

"The Impulse Response Of An Aperture: Numerical Calculations Within The Framework Of The Wedge Assemblage Method." R.S. Keiffer, J.C. Novarini, and G.V. Norton, JASA, Volume 95, Number 1, pp 3-12, January 1994.

"Optical Design Of A Near-Uv Coronagraph For Sounding Rocket Platform", Prinz, Dianne K.(Dr), Korendyke, Clarence (Dr), Socker, Dennis G.(Dr), Optical Engineering, Vol. 33 #2, Pp. 479-483, February, 1994.

"The Physics Of Coronal Closed-Field Structures", Antiochos, Spiro K.(Dr), Cospar Syn El-S Adv. In Sp Res, Vol. 14 #4, Pp. 139-148, February, 1994.

"Gamma-Ray Limits On Galactic 60fe And 44 Ti Nucleosynthesis", Share, Gerald H.(Dr), M. D. Leising, Astrophysical Journal, Vol. 424, pp. 200-207, March, 1994.

"Retrieval Of Absolute Thermospheric Concentrations From The Far Uv Dayglow: An Application Of Discrete Inverse Theory", Meier, Robert R.(Dr), Picone, Michael (Dr), Journal Of Geophysical Research, Vol. 99 #4, pp. 6307-6320, April, 1994.

"Comparison Between Cool And Hot Plasma Behaviors Of Surges", Antiochos, Spiro K.(Dr), Golub, L., Schmieder, B., Astrophysical Journal, Vol. 425, pp. 326-330, April, 1994.

"A Neural Network Approach to Routing Without Interference in Multihop Radio Networks", J. E. Wieselthier, C. M. Barnhart, and A. Ephremides, IEEE Transactions on Communications, 42-1 pp. 166-177, January 1994.

"Shear O Estimates from Interface Waves in Marine Sediments." M.K. Broadhead, H. Ali and L.D. Bibee, JASA; 95, (3), pp 1650-1653, March 1994.

"Prefiltering for Improved Correlation Detection of Bandlimited Transient Signals." L.A. Pflug, G.E. Ioup, J.W. Ioup and R.L. Field, JASA; 95, (3), pp 1459-1473, March 1994.

"An Experience Modeling Critical Requirement", Charles Payne, Andrew Moore, David Mihelcic, Proceedings, COMPASS, 1994.

"An Experience Modeling Critical Requirements", C. Payne, A. Moore, D. Mihelcic, EEE Proc. 9th Conf. on Computer Assurance, 1994.

"Covert Channels - Here to Stay?", Myong Kang, COMPASS, 1994.

"A Formal Model of Several Fundamental VHDL Concepts", Goldschlag, D., Proceedings of COMPASS '94, 1994.\*

"A General Theory of Composition for Trace Sets Closed Under Selective Interleaving Functions", McLean, J., Proceedings of 1994 IEEE Symposium on Research in Security and Privacy, 1994.\*

"Confidentiality in a Replicated Architecture Trusted Database System: A Formal Model", (with Oliver Costich and John McDermott), McLean, J., Proceedings of the Computer Security, Foundations Workshop VII, 1994.\*

"Quantitative Measures of Security", McLean, J., Proceedings of DCCA-4, 1994.\*

"An Epistemic Logic of Situations", in Theoretical Aspects of Reasoning About Knowledge (TARK 1994), Syverson, P., ed. by Ronald Fagin, Pacific Grove CA, Morgan Kaufman Pub. Inc., pp. 109-121, March 1994.

"European Activities in Virtual Reality, Encarnacao", J., M. Goebel, and L. Rosenblum, IEEE Computer Graphics and Applications, Vol. 14, No. 1, pp. 66-74, January 1994.

"Challenges in the IV&V of C2E Software", Kurt Askin, et al. ADPA Conference, USAF Academy, Colorado Springs, CO. 22-25, March 1994.

"Research Issues in Scientific Visualization", Rosenblum, L.J., IEEE Computer Graphics and Applications, Vol. 14, No. 2, pp. 61-63, March 1994.

"Research Issues in Volume Visualization", Kaufman, A., W. Krueger, K.H. Hoehne, L. Rosenblum, W. Schroeder, IEEE Computer Graphics and Applications, Vol. 14, No. 2, pp. 64-67, March 1994.

"Underwater Imaging: Progress and Problems", L. Rosenblum and B. Kamgar-Parsi, in Frontiers of Scientific Visualization, Academic Press, L. Rosenblum et al. (eds), to appear 1994

"On Commonalities of Signal Design for Non Gaussian Channels", N. A. Chu, G. C. Orsak, N. C. Warke, Proc. 28th Annual Conference on Information Science and Systems, Communications, Computer Control and Signal Processing, Princeton University, New Jersey, March 1994.

"Visualizing Time Dependent Data from Molecular Dynamics Simulations Using AVS", Upul R. Obeysekare, Chas J. Williams and Robert O. Rosenberg, AVS 94 Conference Proceedings NRL/PO/5590--94-0003, Scientific Visualization Laboratory, CCS, Information Technology Division, NRL Washington, DC, 1994.\*

"Operation Of A Nonlinear Loop Mirror In A Laser Cavity", I.Duling, C.Chen, P.Wai, Journal of Quantum Electronic JFW 10/28/92 C.Menyuk Jan. 94, V.30, #1, p.1994

"Analysis Of Filamentation In Broad-Area Diode Laser Amplifiers", R.Lang, D.Mehuys, D.Welch, L.Goldberg IEEE, J.Quant. Elect. JFW 10/26/92 Publ. Feb. 94

"Fast-Neutron Radiation Effects in a Silica-Core Optical Fiber Studied by a CCD-Camera Spectrometer", D.D. Griscom, M. Gingerich, E. Friebele, Applied Optics (in press) scheduled for 20 Feb 1994 issue.

"Impact Location and Energy Prediction", 53.J. S. Sirkis (Univ MD), K. Shaw (VA TECH), E. J. Friebele and A. D. Kersey, 1994 North American Conference on Smart Structures and Materials, Orlando, FL (13-19 Feb 1994), publication in SPIE Proceedings.\*

"In-line Fiber Etalon for Strain Measurements", 54.J. Sirkis (Univ MD), T. A. Berkoff (SFA Inc.), D. D. Brennan (Univ MD), A. D. Kersey, M. A. Putnam and E. J. Friebele, 1994 North American Conference on Smart Structures and Materials, Orlando, FL (13-19 Feb 1994), publication in SPIE Proceedings.\*

"Comparison Of Laser Susceptibility Of Hybrid Lwir And Vertically Integrated Pp Hgcdc Fpas To Co<sub>2</sub> Laser Irradiation", 66.C. A. Hoffman and F. J. Bartoli, 32nd IRIS Symposium on Infrared Countermeasures, APL, Johns Hopkins University, Laurel, MD (Apr 94) and publication in Proceedings.\*

"A Parametric Study Of GaAs/AlGaAs Multiple Quantum Well Diffractive Structures", S. Bowman, W. Rabinovich, C. Dyono, D. Katzer and K. Ikossi-Anastasiou, submitted for conference proceedings of CLEO, 94, May 8-12, 1994 in Anaheim, CA, 1994.\*

"Three Dimensional Imaging Using Coherent Nonlinear Optical Gates", M. Bashkansky, P. Battle and J. Reintjes, submitted for conference proceedings of CLEO-94, May 8-12, 1993 in Anaheim, CA, 1994.\*

"Tunable Operation of Ce<sup>3+</sup>:LiSrAlF<sub>6</sub> Laser Between 285-297 nm", J. Pinto, G. Rosenblatt and G. Quarles, submitted for conference proceedings of CLEO-94, May 8-12, 1994 in Anaheim, CA, 1994.\*

"Modelling And Comparison With Recent Lensing Experiments In Aggase<sub>2</sub> And Zngep<sub>2</sub> Submitted For Spie Conference Proceedings From Oe Laser", G. Catella, D. Burlage, C. Marquardt, 94, Los Angeles, CA, Jan. 23-28, 1994.\*

"Mid-Infrared Lasing Characteristics Of Praseodymium Doped Lanthanum Trichloride", S. Bowman, J. Ganem and B. Feldman, submitted for the Technical Digest at the CLEO-94 conference, May 8-13, 1994 in Anaheim, CA.

"Observation Of Induced Subcritical Bifurcation By Near-Resonant Perturbations" Physical Review Letters, S.Vohra, L.Fabiny, K.Wiesenfeld, Publ. V.72, #9, p.1333, Feb. 94

"Depolarized Source For High Power Remote Operation Of An Integrated Photonics Optical Modulator", M. Howerton, W.K.Burns Publ. V.6, #1, p.115, June 94, Tech. Lrs. JFW 6/2/93

"Absorption Losses In Mgo-Doped And Undoped Potassium Niobate", L. Busse, L.Goldberg, M.Surette, J. Applied Physics JFW 5/27/93, G. Mizell(virgo optics), Publ., V.75, #2 Jan.94

"Observation Of Inhomogeneous Dynamic Electrostrict Response In Ferroelectric Relaxors", S.Vohra, L.Fabiny, F.Bucholtz, Lrs.JFW 6/93 Applied Physics, V.64, #7, p.848, Feb. 94

"Three Channel Low Frequency Fiber Optic Voltage Sensor", L. Fabiny, S.Vohra, Optics Letters JFW 9/7/93 F.Bucholtz, A.Dandridge Publ. V.19, #3, Feb. 94

"All Fiber Bragg Grating Strain-Sensor Demodulation Technique Using All Electronics Letters", M.Davis, A.Kersey, JFW 10/1/93 Publ. V.30, #1, p.75, Jan. 94

"High Power Upconversion Lasing At 810 Nm In Tm:Zblan Electronics Fiber", M.Dennis, J.Dixon, I.Aggarwal JFW, #2, p.136 11/4/93

"Absorption Losses In Mg Doped And Undoped Potassium Niobate", 31 L. Busse, L. Goldberg, M. Surette and G. Mizelle, published in J. Applied Physics, Vol. 75, No. 2 (1994)

"Impact Location and Energy Prediction", J. S. Sirkis (Univ MD), K. Shaw (VA TECH), E. J. Friebele and A. D. Kersey, 1994 North American Conference on Smart Structures and Materials, Orlando, FL , publication in SPIE Proceedings. (13-19 Feb 1994).\*

"In-Line Fiber Etalon For Strain Measurements", J. Sirkis (Univ MD), T. A. Berkoff (SFA Inc.), D. D. Brennan (Univ MD), A. D. Kersey, M. A. Putnam and E. J. Friebele, 1994 North American Conference on Smart Structures and Materials, Orlando, FL , publication in SPIE Proceedings. (13-19 Feb 1994).\*

"Comparison Of Laser Susceptibility Of Hybrid Lwir And Vertically Integrated Pv Hgcdc Fpas To Co<sub>2</sub> Laser Irradiation", C. A. Hoffman and F. J. Bartoli, 32nd IRIS Symposium on Infrared Countermeasures, APL, Johns Hopkins University, Laurel, MD and publication in Proceedings. (Apr 94).\*

"Resonant Third-Order Optical Response In The Metallo-Phthalocyanines At 1064 Nm", F. J. Bartoli, J. R. Lindle, J. S. Shirk, S. R. Flom, A. W. Snow and M. E. Boyle, ICONO'1 Conference Proceedings, special issue in Nonlinear Optics, 1994.\*

"Extrapolating Radiation-Induced Loss Measurements In Optical Fibers From The Laboratory To Real Work Environment", E. J. Friebele, M. E. Gingerich and D. L. Griscom, DoD Fiber Optics Conference, McLean, VA and published in Proceedings.(Mar 94).\*

"Contiguous Fiber Bragg Grating Arrays Produced On-Line During Fiber Draw", C. G. Askins, M. A. Putnam, G. M. Williams and E. J. Friebele, Proceedings, SPIE Vol. 2191 (Smart Structures and Materials).\*

"Nonlinear Optical Properties Of An Optical Limiting By A Glassy Phthalocyanine", S. R. Flom, R.G.S. Pong, J. S. Shirk, R. D. George and A. W. Snow, Thin Films for Photonic Applications Meeting, Wash., DC and publication in Polymer Preprints, Conf. Proceedings.(Aug 94).\*

"Nonlinear Optical Properties Of A Poly-Phenylenevinylene/C<sub>60</sub> Composite", S. R. Flom, H. W. Sarkas, R.G.S. Pong, F. J. Bartoli and Z. H. Kafafi, Thin Films for Photonic Applications Meeting, Wash., DC and publication in Polymer Preprints, Conf. Proceedings.(Aug 94).\*

"The Production Of Diamond Tubes And Fibers", A. Morrish, J. Glesener, M. Fehrenbacher, B. Maruyama, and P. Natishan, Diamond and Related Materials, VOL. 3, P. 176. (1994)

"Hole Capture In Boron Doped Diamond", J.W. Glesener, Appl. Phys. Lett., vol. 64, p. 217. (1994)

"Growth Of Fcc-Fe Films On Diamond", D.P. Pappas, J.W. Glesener, V.G. Harris, Y.U. Idzerda, J.J. Krebs, and G.A. Prinze, Appl. Phys. Lett. vol. 64, p. 28. (1994)

"Confirmation Of {113} Facets On Cvd-Grown Diamond", K.Snail, Z.Lu, R. Weimer, J. Heberlein, E. Pfender and L. Hanssen, Journal Crystal Growth, vol. 137 (1994).

"New Infrared Laser Channels For Praseodymium", S. Bowman, J. Ganem, B.J. Feldman and A.W. Kveny, included in conference proceedings for the Advanced Solid State Lasers, Meeting Salt Lake City, UT. Feb., 1994.\*

"Nonlinear Optical Field Cross-Correlation Techniques For Imaging Through A Strong Scattering Medium", M. Bashkansky, C. Adler, P. Battle and J. Reintjes, to be included in conference proceedings at the INVERSE OPTICS III Conf., in Orlando, FL. April 4-8, 1994.\*

"Fiber Bragg Grating Based Sensors With Nonlinear Strain Transduction" A. Kersey, M. Davis Proc. F.O. Laser Sensors JFW 1/21/94 SPIE V.2070 Proceedings of IS&T/SPIE Symposium on Electronic Imaging Science and Technology, Hands-Off Interaction with Menus in Virtual Spaces Rudolph P. Darken. February, 1994.\*

"Applications of Mathematics to Structural Chemistry", Karle, J., of Chemical Information and Computer Science, 381-390 (Mar., 1994).

"Conformation Of The Oxalamide Group In Retro-Bispeptides", Karle, I. L., Ranganathan, D., Shah, K. and Vaish, N, K., Int. J. Peptide Protein Res. 43, 160-165 (1994).

"Conformational Analysis Of The Receptor-Selective, Cyclic Opioid Peptide, Tyr-CID-Cys-Phe-D-Pen|Oh (Jom-13) Comparison Of X-Ray Crystallographic Structures, Molecular Mechanics And Simulations And <sup>1</sup>h Nmr Data." Lomize, A. I., Flippen-Anderson, J. L., George, C., Mosberg, H., JACS 116, 429-436 (1994).

"Structure Of 1-Benzoyl-4,4,5,5-Tetramethyl-2-Phenylimidazoline Hydrate." Flippen-Anderson, J. L., Zajac, W.W., Buzby, J. H., and Walters, T. R. (1993) Acta C49, 1792-1793 (1994).

"Structures Of Substituted Diphenyl Oxalates" George, C., Lahti, P. M., Modarelli, D. A., and Inceli, A.. (1994) Acta Cryst. C., in press.

"The Observation of Growth Steps, Spiral Dislocations, and Molecular Packing on the Surface of Lysozyme Crystals with the Atomic Force Microscope", Konnert, J. H., D'Antonio, P. and Ward, K. B., Acta Cryst., in press.

"Usefulness of One Electron Properties in the Study of the Nitromethane to Methyl Nitrate Rearrangement", Roszak, S. Lowrey, A. H., Sokalski, W. A., and Kaufman, J. J., J. of Mol. Graphics, in press.

"Developments in Anomalous Scattering for Structure Determination", Karle, J., Proc. of Intern. Conf. on Anomalous Scattering, Malente, Germany, in press.\*

"Predicting The Vibrational Spectra Of Simulants", Lowrey, A. H. and Famini, G. R., Proc. of 7th Intern. Simulant Workshop, in press.\*

"Resolution of Isoforms of Natural and Recombinant Fibrinolytic Snake Venom Enzyme Using High Performance Capillary Electrophoresis", Markland, F. S., Morris, S., Deschamps, J. R. and Ward, K. B., J. of Liquid Chrom., in press.

"Synthesis, Optical Resolution, Absolute Configuration And Preliminary Pharmacology Of (+)- And (-)-Cis-2,3,3a,4,5,9b-Hexahydro-1-Methyl-1-H-Pyrrolo[3,2-H]Isoquinoline, A Structural Analog Of Nicotine", Glassco, W., Suchocki, J., George, C, Martin, B.R. and May, E. L., J. Med. Chem, in press. (1993)

"Conformation Of The Flexible Bent Helix Of Leu1-Zervamicin In Crystal C And A Possible Gating Action For Ion Passage", Karle, I. L., Flippen-Anderson, J. L., Agarwalla, S. and Balaram, P., Biopolymers, in press.

"The Crystal Structure Of Methyl N, N-Diallyl-O-Tert-Butyltyrosyl- -Amino Isobutyl- - Aminoisobutyrate" Flippen-Anderson, J. L., George, C., and Deschamps, J. Acta Cryst, in press. (1993)

"The Crystal Structure Of Deltakephalin: A -Selective Opioid Peptide With A Novel -Bend-Like Conformation", Flippen-Anderson, J. F., Deschamps, J. R., Ward, Keith and George, C., Int. J. of Protein and Peptide Res., in press. (1993)

"Hydrogen Bonding Patterns In X-Ray Diffraction Studies Of Neuropeptides", Flippen-Anderson, J. L., George, C. and Deschamps, J. in press.

"Polynitroalkyl Derivatives Of  $Sf5n=Ccl2$  : Nitrations Of  $Sf5$  Imines", Sitzmann, M. E., & Gilardi, R. D. J. Fluorine Chem., accepted.

"Systematic Substitution on the Cubane Nucleus. Synthesis and Properties of 1,3,5-Trinitrocubane and 1,3,5,7-Tetranitrocubane", Eaton, P., Xiong, Y. and Gilardi, R. accepted (1993)

"Synthesis Of Cyclic Nitramines From Products Of The Cyclocondensation Reaction Of Guanidine With 2,3,5,6-Tetrahydroxy-1,4-Piperazinedicarboxaldehyde", Dagley, I., and Flippen-Anderson, J. L. J. Org. Chem., accepted (1993)

"Exocyclic Carbanionic Functionalization Of Cubane. Synthesis Of 1,4-Bis(Dinitromethyl)Cubane" Moriarty, R. M., Martin, R. M., George, C., Flippen-Anderson, J. L., and Miller, R. S. JACS, accepted (1993)

"Development Of Novel, Enantioselective And Potent Dopamine Uptake Inhibitors Through Alteration Of The Piperazine Ring Of Gbr-12909". Dorota, M., de Costa, B. R., Rothman, R. B., Dersch, C. M., Silverthorn, M. L., Partilla, J. S., Becketts, K. M., George, C., Carrol, F. I., and Rice, K. J. Med. Chem., accepted.(1993).

"Potentiometric Evaluation Of The Ion Selective Characteristics Of 1,4-Bridged Cubyl Diester Crown Ethers", Moriarty, R. M., Chandar Rao, M. S., Tuladhar, S. M., D'Silva, C., Gilardi, R. and Williams, G. Anal. Chem., accepted.(1993).

"Total Synthesis Of Racemic And Optically Active Compounds Related To Physostigmine And Ring C-Hetero-Analogues From 1,3-Dimethyl-3-(2'-Dimethylaminoethyl)-5-Methoxy-2-Hydroxyindoline", Pei, Z.-F., Greig, N. H., Flippen-Anderson, J. L., Bi, S., and Brossi, A., Helvetica Chimica Acta. accepted. (1994)

"Computational And Spectroscopic Studies On Hydrated Molecules", Lowrey, A. H. and Williams, R. W., Chapter for Advances in Molecular Structure Research, Vol 1, in press.

"Diffraction Studies Of Model And Natural Helical Peptides", Karle, I. L., Chapter for 'Membrane Protein Structure: Experimental Approaches', Ed. Stephen H. White, in press.

"A Finite Different Approach To Acoustic Tomography In Anisotropic Media", Y.Q. Wang, R.A. Kline, R.B. Mignogna, and P.P. Delsanto Journal of Nondestructive Evaluation, 1994

"A Theory of Condensation Model Reduction" L.D. Flippen, Jr. Computers Math. Applic. Vol 27, No. 2, pp 9-40, 1994

"Deposition-Temperature Dependence Of Structural Anisotropy In Amorphous Tb-Fe Films", V.G. Harris, W.T. Elam, and N.C. Koon; F. Hellman (Univ of California at San Diego) Physical Review B, Vol. 49, No. 5, 1 February 1994.

"Elastic Inclusions and Inhomogeneities in Transversely Isotropic Solids" H.Y. Yu S.C. Sanday; C.I. Chang, Proc. R. Soc. Lond. A (1994).

"Electron Paramagnetic Resonance Forbidden Transitions from Hydrogen in Polycrystalline Diamond Films", S.L. Holder, and L.G. Rowan (Univ of North Carolina); J.J. Krebs Appl. Phys. Lett. 64 (9), 28 February 1994.

"Evaluation Of Atomization By The Rapidly Spinning Cup Process", K.P. Cooper, and J.D. Ayers International Journal of Powder Metallurgy, Vol. 30, No. 1, 1994 American Powder Metallurgy Institute, p 77

"Expected Performance of a Radio-Frequency Biased R-SQUID Noise Thermometer Below 6mK", R.J. Soulen, Jr. Physica B 194-196 (1994).

"Extended X-Ray Absorption Fine Structure Studies of Heat-Treated FCC-Fe<sub>50</sub>Cu<sub>50</sub> Powders Processed Via High-Energy Ball-Milling" P. Crespo and A. Hernando (Instituto de Magnetismo Aplicado, Spain); A.G. Escorial (CENIM-CSIC, Spain); K.M. Kemner, and V.G. Harris 6th Joint MMM Intermag Conference, 20-23 June 1994, Albuquerque, NM/Journal of Applied Physics Conf. Proceedings.\*

"Finite Element-Based Damage Detection In Structures", D.K. Lindner (VPI & SU); G.C. Kirby 1994 Control Conference, Baltimore, MD/Refereed Proceedings. 29-31 June 1994.\*

"Growth Of Fcc Fe Films On Diamond", D.P. Pappas, J.W. Glesener, V.G. Harris, Y.U. Idzerda, J.J. Krebs, and G.A. Prinz Appl. Phys. Lett. 64 (1), pp 28-30 3 January 1994

"Measure Of The Elastic And Transport Properties Of Tase<sub>3</sub> Through The Stress-Induced Phase Transition", T.M. Tritt, R.L. Jacobsen, A.C. Ehrlich, and D.J. Gillespie Physica B 194-196 1303-1304 (1994)

"Measurements Of Absolute Temperature Below 0.738k Using A Josephson-Junction Noise Thermometer" R.J. Soulen Jr; W.E. Fogle (Lawrence Berkeley Lab); J.H. Colwell (Retired) Journal of Low Temperature Physics, Vol. 94, Nos. 5/6, pp 385-487, March 1994

"Microscopic Model For The Isotope Effect In The High Tc Oxides" V.Z. Kresin (Lawrence Berkeley Lab); S.A. Wolf Physical Review B, Vol. 49, No. 5, pp 3652-3654, 1 February 1994-I.

"On the Estimation of Cahn-Hagel Interface Migration Rates", R.A. Vandermeer; D. J. Jensen (Riso National Lab, Denmark) Scripta Metallurgica et Materialia, Vol. 30, No. 12, pp 1575-1580, 1994

"On The Role Of Cu And Nb In The Formation Of Nanocrystals In Amorphous Fe<sub>73.5</sub>Nb<sub>3</sub>Cu<sub>1</sub>Si<sub>13.5</sub>B<sub>9</sub>", J.D. Ayers, V.G. Harris, J.A. Sprague, and W.T. Elam Appl. Phys. Lett. 64 (8) 21 February 1994, p 974

"Optimal Actuator Size And Locations For Multivariable Control Using Genetic Algorithms", G.C. Kirby, and P. Matic; D.K. Lindner (VPI&SU) 1994 ASME Winter Annual Meeting, Adaptive



Structures & Material System Symposium, Chicago, IL/Proceedings and ASME Journal, 6-11 November 1994.\*

"Spectroscopic Ellipsometry Study Of The Dilute Magnetic Semiconductor System Zn(Mn,Fe,Co)Se", Y.D. Kim, S.L. Cooper, and M.V. Klein (Univ. of Illinois); B.T. Jonker Physical Review B, Vol. 49, No. 3, 15, p 1732, January 1994.

"Temperature Dependence Of Elastic Properties of TaSe<sub>3</sub>", R.L. Jacobsen, T.M. Tritt, A.C. Ehrlich, and D.J. Gillespie Physica B 194-196 (1994).

"Synchronizing Chaotic Circuits" T.L. Carroll, and L.M. Pecora AIP Conference Proceedings 296, The Chaos Paradigm: Developments and Applications in Engineering and Science, Edited by R.A. Katz, American Institute of Physics, p 127, 1994\*

"The Magnetic And Structural Properties Of Pulsed Laser Deposited Epitaxial Mnzn-Ferrite Films", C.M. Williams, D.B. Chrisey, P. Lubitz, K.S. Grabowski, and C.M. Cotell J. Appl. Phys. 75(3), pp 1676-1680, 1 February 1994

"Transient Response Measurements of Kink Effect in InAlAs/InGaAs/InP HEMTs", Kruppa, W. Boos, J. B, Electronics Letters Volume 30(4) Pages 368-369, 02/17/94

"Nonlinear Theory of the Free-Electron Laser Based Upon a Coaxial Hybrid Wiggler", Freund, H. P., Jackson, R. H., Pershing, D. E., Taccetti, J. M., Phys. Plasmas Volume 1(4) Pages 1046-1059, 04/00/94.

"Low Resistivity ( $-10^{-5} \text{Wcm}^{-2}$ ) Ohmic Contacts to 6H Silicon Carbide Fabricated Using Cubic Silicon Carbide Contact Layer", Dmitriev, V.A. \*(Howard University Irvine, K. (Howard University) Spencer, M. (Howard University) Kelner, G. (NRL 6856) Appl. Phys. Lett Volume 64(3) Pages 318-320, 01/17/94

"Magnetoplasma Oscillations in Nanoscale Tubules with Helical Symmetry", Lin-Chung, P. J., Rajagopal, A. K., Physical Review B Volume 49(12) Page 8454, 03/15/94

"Defect Assisted Tunneling in GaAs/AlGaAs/GaAs Heterostructures" J. Magno, R., Spencer, M. G., Appl. Phys. Volume 75(1) Page 368 Kanert, O. Kuchler, R., Ngai, K. L. (NRL 6807) 01/01/94.

"Significant Differences Between Nuclear-Spin Relaxation and Conductivity Relaxation in Low-Conductivity Glasses", Jain, H. \*(Lehigh University), Physical review B, Volume 49(1), Pages 76-82, 01/01/94

"All-Refractory GaAs FET Using Amorphous TiWSi<sub>x</sub> Source/Drain Metallization and Graded-In<sub>x</sub>Ga<sub>1-x</sub>As Layers", IEEE Electron Device Letters, Volume 15 (1), Pages 7-9, 01/01/94, 13 May 1994

"Circulation Persistence and Biodistribution of Lyophilized Liposome-Encapsulated Hemoglobin An Oxygen Carrying Resuscitative Fluid", A.S. Rudolph, R.O. Cliff, R. Klipper, B.A. Goins, and W.T. Phillips, Critical Care Medicine Journal, 22(1):142-150 (1994)

"Formation and Naphthoyl Derivatization of Aminosilane Self-Assembled Monolayers: Characterization by Atomic Force Microscopy and Ultraviolet Spectroscopy", C.N. Durfor, D.C. Turner, J.H. Georger, B.M. Peek, and D.A. Stenger, Langmuir, 10:148-152 (1994)

"The Effect of Vesicle Size on the Polymerization of a Diacetylenic Lipid", B. Peek, J. Callahan (6113), K. Namboodiri, A. Singh, and B.P. Gaber, *Macromolecules*, Jan:292-297 (1994)

"Compositional and Thermal Effects on Chemically Processed AIN-BN Nanocomposite Powders", G.M. Chow, T.D. Xiao, X. Chen, and K.E. Gonsalves, *Journal of Materials Research*, 9(1):168-175 (1994)

"The Permittivity at X-Band Frequencies of Nickel-Coated Graphite Fibers in an Epoxy Matrix", Y-S. Ho and P.E. Schoen, *Journal of Materials Research*, 9(1):246-251 (1994)

"Biologically Engineered Microstructures: Controlled Release Applications", J.M. Schnur, A.S. Rudolph, and R.R. Price, *Journal of Controlled Release*, 28:3-13 (1994)

"Diacetylenic Lipid Tubules: Experimental Evidence for a Chiral Molecular Architecture", J.M. Schnur, B.R. Ratna, J.V. Selinger, A. Singh, K.R.K. Easwaran, and G. Jyothi, *Science*, accepted (as of 4/94)

"Bathymetric Effects on Long-Range MFP Signal Performance in the Northeast Pacific", J. F. Smith, III, R. Heitmeyer, O. Diachok and E. Livingston, *J. Underwater Acoustics*, accepted, (1994).

"VAST Experimental Signal Results on the Benign Sound Speed Track", E. Livingston, R. Heitmeyer, O. Diachok and J. F. Smith, III, *J. Underwater Acoustics*, accepted, (1994).

"The Effects of Irregular Bathymetry on Long-Range MFP Signal Performance: Theory and Experiment" J. F. Smith, III, R. Heitmeyer, O. Diachok and E. Livingston, *J. Underwater Acoustics*, accepted, (1994).

"A Matched Field Comparison of Sound Speed Fields Using VAST Long Range Data" E. Livingston, R. Heitmeyer, O. Diachok and J. F. Smith, III, *J. Underwater Acoustics*, accepted, (1994).

"Matched Field Processing Signal Performance in Sediment-Interacting Propagation Environments", Kwang Yoo and Richard Heitmeyer, accepted for publication by the *Journal of Underwater Acoustics*, will be published in October 1994.

"Cruise Missile Overflight Simulation", E.L. Kunz, *U.S. Navy Journal of Underwater Acoustics*, 44(1), January 1994.

"Results of an Improved Algorithm to Detect Aircraft Using Underwater Acoustic Sensors", E.L. Kunz, *U.S. Navy Journal of Underwater Acoustics*, 44(3), July 1994

"Scattering From Boundary Protuberances And Reverberation Imaging", T. C. Yang, *J. Acoust. Soc. Am.* 93, 231-242 (1993).

"Very Low Frequency Ice Reflectivity", J. Wolf, O. Diachok, T. C. Yang, S. Wales and R. Dicus, *J. Acoust. Soc. Am.* 93, 1329-1334 (1993).

"Broadband Source Localization And Signature Estimation", T. C. Yang, *J. Acoust. Soc. Am.* 93, 1797-1806 (1993).

"Low Frequency Arctic Reverberation: (I) Measurement Of Underice Backscattering Strengths From Short-Range Direct Path>Returns", T. H. Hayward and T. C. Yang, *J. Acoust. Soc. Am.* 93, 2517-2523 (1993).

- "Low Frequency Arctic Reverberation: (Ii) Modeling Of Long Range Reverberation And Comparison With Data", T. C. Yang and T. H. Hayward, J. Acoust. Soc. Am. 93, 2524-2534 (1993).
- "Low frequency Arctic reverberation: (III) Measurement of ice and bottom backscattering strength from medium range-bottom bounce-returns", J. Acoust. Soc. Am. 94, 1003-1014 (1993).
- "Matched Mode Processing For Sparse Three-Dimensional Arrays", T. C. Yang and C. W. Bogart, J. Acoust. Soc. Am., to appear in May 1994 issue.
- H. E. F. Williams, T. C. Yang and R. M. Kille, "Laboratory-Scale Measurement Of Scattering From Modeled Arctic Ice Ridges", Ultrasonics, accepted for publication.
- "Optimization Of Hydrophone Placement For Acoustic Arrays Using Simulated Annealing", T. J. Hayward, J. Acoust. Soc. Am. 95, 201-212 (1994).
- "Experimental Characterization Of Elastic Waves In A Floating Ice Sheet", G. Giellis and T. C. Yang, J. Acoust. Soc. Am., accepted for publication.
- "The Ambient Noise Field Measured On An Ice-Implanted Geophone Array", G. Giellis and T. C. Yang, J. of Underwater Acoustics, to appear in July 1994 issue.
- "Scattering From An Object In A Stratified Medium: (I) Frequency Dispersion And Active Localization", T. C. Yang and T. Yates, J. Acoust. Soc. Am., accepted for publication.
- "Scattering from an object in a stratified medium: (II) Extraction of scattering signature", T. C. Yang and T. Yates, J. Acoust. Soc. Am., accepted for publication.
- "Matched Field Localization With Horizontal Arrays In Shallow Water: Spatial Sampling And Effective Aperture", C. W. Bogart and T. C. Yang, J. Acoust. Soc. Am., accepted for publication.
- "Long-Range Backscatter From The Mid-Atlantic Ridge", N.C. Makris and J.M. Berkson, J. Acoust. Soc. Am., Vol 95 (4), p. 1865-1881, Apr 1994
- "Improved Linear Representation of Surface Waves for Slowly Varying Bottoms and Currents", Dennis Creamer and J. Wright, J. Fluid Mech., Vo. 26, p. 65-74, 1994.
- "Computers in Physics", James Cole, Rudolph Krutar, Dennis Creamer, and Susan Numrich, "Cellular Automaton Solutions of the Wave Equation", To be published in 1994.
- "Performance Of Acoustic Tomography Via Matched Field Processing", A. Tolstoy (Invited paper), accepted by J. Computational Acoust., 1994.
- "The Matched Field Processing Benchmark Problems", M.B. Porter and A. Tolstoy, accepted by J. Computational Acoust., 1994.
- "A Hierarchic p-Version Boundary Element Method for Axisymmetric Acoustic Scattering and Radiation", James Grannell, Joseph Shirron, Luise Schuetz-Couchman, J. Acoust. Soc. Am., 95(4), May 1994.
- "Approximate Ray Synthesis of the Surface Fields of a Submerged Elastic Cylindrical Shell with Hemispherical Endcaps", Jim-Meng Ho and Luise S. Couchman, submitted to the J. Acoust. Soc. Am., 8 Jul 1993. Accepted 1994.

- "Method Of Superposition Applied To Scattering From A Target In Shallow Water", A. Sarkissian, submitted to J. Acoust. Soc. Am. Accepted 1994.
- "Wave Mixing Effects On A Periodically Ribbed Cylindrical Shell", D. M. Photiadis, submitted to the J. of Vibration and Acoustics (1993). Accepted 1994.
- "Double Layer Actuators", D. M. Photiadis, J. A. Bucaro, and R. D. Corsaro, submitted to J. Acoust. Soc. Am.. Accepted 1994.
- "Scattering From Flexural Waves On A Ribbed Cylindrical Shell", D. M. Photiadis, J. A. Bucaro, and B. H. Houston, submitted to J. Acoust. Soc. Am. Accepted 1994.
- "Local Radiation Impedance for Fluid-Loaded Smooth Elastic Shells of Arbitrary Shape", Yang Yang, 1993, Submitted to Wave Motion. Accepted 1994.
- "Fully Three-Dimensional Exact And Ray Asymptotic Formulation Of The Characteristic Wavefields On A Spherical Shell Surface", J. M. Ho, and L. B. Felsen, J. Acoust. Soc. Am. 94 (Dec 1993) (in press)
- "Acoustic Scattering By Submerged Elastic Cylindrical Shells: Uniform Ray Asymptotics", J. M. Ho, J. Acoust. Soc. Am. 94 (Nov 1993) (in press)
- "A Modified Ray Acoustic Algorithm For Near Field Scattering By Submerged Elastic Cylindrical Shells", J. M. Ho, submitted to J. Acoust. Soc. Am. Accepted 1994.
- "Monostatic And Bistatic Ray Acoustic Scattering By Submerged Elastic Spherical Shells", J. M. Ho, submitted to J. Acoust. Soc. Am., 95(3), pp. 1264-1273, 1994.
- "Near Field Ray Acoustic Response Of Submerged Elastic Spherical Shells", J. M. Ho, submitted to J. Acoust., Soc. Am. Accepted 1994.
- "Localization of Helical Flexural Waves by Irregularity", D.M. Photiadis, J. Acoust. Soc. Am. Accepted 1994. P.M. Ogden, F.T. Erskine,
- "Surface Scattering Measurements Using Broadband Explosive Charges in the Critical Sea Test Experiments", J. Acoust. Soc. Am., 95(2), pp. 746-761, February 1994.
- "Long-Range Backscatter from the Mid-Atlantic Ridge", N.C. Makris, J.M. Berkson, J. Acoust. Soc. Am.; 95(4), pp. 1864-1881, April 1994.
- "Comparison of Data and Model Predictions for Heard Island Acoustic Transmissions", B.E. McDonald, M.D. Collins, W.A. Kuperman, and K.D. Heaney, J. Acoust. Soc. Am.; (Accepted 1993).
- "The Acceleration Field Associated with Vorticity Flux Convergence", J. Phys. Oceano.; (Accepted 1993)
- "Path Integral Solution of the Time-Domain Progressive Wave Equation and Wave Propagation in Random Media", D.K. Dacol, Waves in Random Media, Accepted 1994.
- "Surface and Volume Scattering Measurements Using Broadband SUS Charges in the Critical Sea Test 7 Experiment", P.M. Ogden, F.T. Erskine, J. Acoust. Soc. Am.; Accepted 1994.

"The Spectral Parabolic Equation and Three-Dimensional Backscattering", G. Orris, M.D. Collins, J. Acoust. Soc. Am.; Accepted 1994.

"Overcoming Ray Chaos", M.D. Collins, J. Acoust. Soc. Am., Accepted 1994.

"Generalization of the Split-Step Pade Solution", M.D. Collins, J. Acoust. Soc. Am., Accepted 1994.

"Inverse Problems in Ocean Acoustice", M.D. Collins, W.A. Kuperman, Inverse Problems, Accepted 1994.

"The Multi-Valued Bartlett Processor and Source Tracking", M.D. Collins, L.T. Fialkowski, W.A. Kuperman, J.S. Perkins, J. Acoust. Soc. Am., Accepted 1994.

"Noise Cancellation and Source Localization", M.D. Collins, N.C. Makris, L.T. Fialkowski, J. Acoust. Soc. Am., Accepted 1994.

"Three Dimensional Eigenvalue Processing Simulations for a Three-Dimensional Tripod Array(U)", J.S. Perkins, W.A. Kuperman, J. Underwater Acoustics, Accepted 1994.  
CONFIDENTIAL

"A Radio Optical Reference Frame. V. Additional Source Positions in the Mid-Latitude Southern Hemisphere", J.L. Russell, D.L. Jauncey, J.E. Reynolds, C. de Vegt, N. Zacharias, C. Ma, A.L. Fey, K.J. Johnston, G.L. White, N. Kawaguchi, Y. Takahashi, AJ, 107, 379, 1994.

"A Radio Optical Reference Frame. VI. Additional Source Positions in the Northern Hemisphere", A.L. Fey, J.L. Russell, K.J. Johnston, C. Ma, D.M. Hall, E.R. Holdenried, AJ, 107, 385, 1994.

"A New Microstructure Technology for Fabrication of Metal Mesh Grids", M. Rebbert, P. Isaacson, J. Fischer, M. Greenhouse, J. Grossman, M. Peckerar, H.A. Smith, Applied Optics, Optical Technology, 33, 1286, 1994.

"A Six Year Timing Solution for PSR 1951+32", R.S. Foster, A.G. Lyne, S. Shemar, D.C. Backer, AJ Letters, accepted for publication July 1994.

"The W3 IRS 5 Cluster: Radio Continuum and Water Maser Observations", M. Claussen, R.A. Gaume, K.J. Johnston, T. Wilson, ApJ Letters, 424, L41, 1994.

"High Resolution Measurements of NH<sub>3</sub> Absorption Toward Cas A", R.A. Gaume, T. Wilson, K.J. Johnston, ApJ, 425, 127, 1994.

"VLA Recombination Line Observations of the Cometary HII Region G34.3+0.2: Dynamics and Physical Properties", R.A. Gaume, A. Fey, M. Claussen, Scheduled Sept 10th issue, 1994.

"Radio Imaging of Two Supernova Remnants Containing Pulsars", D.A. Frail, N.E. Kassim, K.W. Weiler, Astronomical J., 107, 1119, [Selected as cover article.] 1994.

"The Radio Nebula of the Soft Gamma Repeater 1806-20", S.R. Kulkarni, D.A. Frail, N.E. Kassim, T. Murakami, G. Vasisht, Nature, 368, 129, 1994.

"Radio, Infrared, and X-ray Activity of Cygnus X-3", Shunji Kitamoto, Sigenori Miyamoto, E.B. Waltman, R.L. Fiedler, K.J. Johnston, F.D. Ghigo, A&A, 281,L85, 1994.

"Correlation Between X-Ray Intensity and Radio Outbursts of Cygnus X-3", Hiroaki Watanabe, Shunji Kitamoto, Sigenori Miyamoto, R.L. Fiedler, E.B. Waltman, K.J. Johnston, F.D. Ghio, ApJ, 1994.

"Detection of Strong Optical Iron Emission in Redshift  $z > 3$  Quasars", R. Elston, K.L. Thompson, G.J. Hill, Nature, [Accepted for publication] 1994

"Radiostrailing Van SN1993J", 95. K.W. Weiler, S.D. Van Dyk, Zenit, January, p 38, 1994.

"Impact Of Assimilating Ssm/I Rainfall Rates On Numerical Prediction Of Winter Cyclones", Chang, S.W., and T.R. Holt, 1994. To appear in *Mon. Wea. Rev.*, January Issue.

"A Satellite Observational And Numerical Study Of The Precipitation Characteristics Of Atlantic Tropical Cyclones". Rodgers, E, S.W. Chang, and H.F. Pierce, Accepted in *Jour Applied Meteor.*, 1993.

"Langrangain Velocity Profiles in the Wake of a High Speed Vessel", L. Meadows, G. Meadows, A. Troesch, S. Cohen, K.P. Beier, G. Root, O.M. Griffin and T.F. Swean, Jr., *Ocean Engineering*, Vol. 21, No. 2, 221-242, 1994.

"Potential Energy in Steep and Breaking Waves", Journal of Fluid Mechanics, W.W. Schultz, J. Huh, R.F. Beck and O.M. Griffin, accepted for publication March 1994.

"A Note of Bluff Body Vortex Formation", O.M. Griffin, Journal of Fluid Mechanics, accepted for publication, April 1994.

"Nonlinear Aspects of the Motion Behavior of Directional Wave Buoys", Proceedings of the 1994 OMAE, vol. I, Feb 1994, pp. 11-18.\*

"Extraction of Hull Characteristics from SAR Images of Ship Wakes", H. T. Wang, O.M. Griffin and G.A. Meadows, IGARSS'94, August 1994.

"Radiative Properties of Water Clouds: Simple Approximations", O.M. Griffin, R.D. Peltzer, H.T. Wang and W.W. Schultz, P. Chylek, P. Damiano, N. Kalyaniwalla, & E.P. Shettle (1994), accepted for publication in *Atmospheric Research*.

"Infrared Radiance and Solar Glint at the Ocean-Sky Horizon", M.D. Mermelstein, E.P. Shettle, E.H. Takken, and R.G. Priest (1994) accepted for publication in *Appl. Opt.*

"POAM 2 Experiment: Preliminary Results and Validation Plans", F. Dalaudier, R. Bevilacqua, J.L. Bertaux, C. Brogniez, E. Chassefière, D. Debrestian, C. Deniel, M. Fromm, J. Hornstein, S. Krigman, J. Lenoble, J. Lumpe, J. Olivero, P. Pruvost, C.E. Randall, D. Rusch and E.P. Shettle, COSPAR meeting, Hamburg, July, 1994, Proceedings.\*

"POAM II: Early Results and Comparisons with the COSPAR International Reference Atmosphere Models", E.P. Shettle, R.M. Bevilacqua, J.S. Hornstein, W.J. Glaccum, D. Debrestian, M. Fromm, S. Krigman, J. Lumpe, J.L. Bertaux, E. Chassefière, F. Dalaudier, C. Deniel, C. Brogniez, J. Lenoble, P. Pruvost, J. Olivero, C. Randall and D. Rusch, COSPAR meeting, Hamburg, July, 1994, Proceedings.\*

"Polar Stratospheric Studies with the Polar Ozone and Aerosol Measurement Experiment (POAM II)", R.M. Bevilacqua, E.P. Shettle, J.S. Hornstein, W. Glaccum, J.D. Lumpe, S.S. Krigman, P.R. Schwartz and D.T. Chen, Proceedings of the American Meteorological Society Eighth Conference on Atmospheric Radiation, Nashville, TN, Proceedings. 23-28 January 1994.\*

"Radar Imaging of Thermal Fronts", F. Askari, G.L. Geernaert, W.C. Keller, and S. Raman, International Journal of Remote Sensing, Vol 14, No.2, pp 275-294, 1994.

"RAR Imaging of Ocean Waves During Saxon/FPN: A Case of Azimuth Travelling Waves", F. Askari and W.C. Keller, Accepted in the special issue of SAXON/FPN Journal of Geophysical Research, May 1994.

"Observations of the Marine Environment from Spaceborne Side-Looking Real Aperture Radars", A.I. Kalmykov, S.A. Velichko, V.N. Tsymbal, Yu. A. Kuleshov--Institute of Radiophysics and Electronics, Ukrainian Academy of Science, Kharkov, Ukraine; J.A. Weinman, Code 975 - NASA Goddard Space Flight Center, Greenbelt, I. Jurkevich, Code 4231, NRL, Elsevier Science Publishing Co. - (U) Remote Sensing of Environment, Vol. 45, pp. 193-208, 1994.

"Sun Induced Variations in Time in the Global Positioning System", S.R. Chubb, Astrophysics and Space Science, in press (1994).

"Electronic Structure of C(2x2) Ba Absorbed on W(001)", L.A. Hamstreet and S.R. Chubb, Phys. Rev. **B15**, in press (1994).

"Polarimetric SAR Image Signatures of the Ocean and Gulf Stream Features", D.L. Schuler, J.S. Lee and Karl Hoppel, IEEE Trans. Geoscience and Remote Sensing, vol. 31, no.6, 1210-1221, Nov 1994.

"Object Identification from Multiple Images Based on Point Matching Under a General Transformation", M.C.K. Yang, and J.S. Lee, IEEE Pattern Analysis and Machine Intelligence (in press).

"Speckle Filtering of Synthetic Aperture Radar Images - A Review", J.S. Lee, P. Dewaele, P. Wambacq, A. Oosterlinck and I. Jurkevich, Remote Sensing Review (in press).

"Classification of Polarimetric SAR images based on the Complex Wishart distribution", J.S. Lee, M. Grunes and R. Kwok, International Journal of Remote Sensing (in press).

"Statistics of Phase Difference and Product Magnitude of Multi-look Complex Gaussian Signals", J.S. Lee, A. R. Miller and K.W. Hoppel, Waves in Random media, IOP Publication (in press).

"Intensity and Phase Statistics of Multi-look Polarimetric and Interferometric SAR Imagery", J.S. Lee, K.W. Hoppel, S.A. Mango and A.R. Miller, IEEE Trans. Geoscience and Remote Sensing (in press).

"Interaction of Turbulent Flow and Free-Surface Waves in Air-Sea Interface Symposium", Leighton, R.I. and Swain, T.F., Jr., 1994 M.A. Donalan, W.H. Hui and W.J. Plant, eds. The University of Toronto Press, Toronto.

"Wave generation in turbulent channel flows", Leighton, R.I. and McHugh, J.P., 1994 Proceedings of ASME Fluids Engineering Conference, Lake Tahoe, Nevada, June 1994.\*

"The secondary flow of the mixed boundary corner flow". Proceedings of the ASME Fluids Engineering Conference, Lake Tahoe, Nevada, June 1994.

"Evolution of a Rotating Barotropic Modon in a Primitive Equation Model" Lipphardt, B.L., Jr., Mied, R.P., Kirwan, A.D., Jr., and Lindemann, G.J. Modeling of Oceanic Vortices (ed. G.J.F.

van Heijst). Proceedings of the Royal Dutch Academy of Sciences. North Holland, Elsevier. (1994).\*

Rovelstad, A.L., Handler, R.A., and Bernard, P.S., "Interpolation Errors In The Computation Of Particle Paths In A Turbulent Shear Flow", Journal of Computational Physics, v. 110, pp. 190-195, 1994.

"Large Eddy Simulation Of Channel Flow Using A Vorticity Transport Subgrid Scale Model. To Appear", Rovelstad, A.L., Handler, R.A., Bernard, P.S., Thomas, J.M., Proceedings of the Agard Fluid Dynamics Symposium, Crete, Greece, 1994.\*

"Simulations Of The Circulation Of The Greenland-Iceland-Norwegian Seas", Heburn, G.W., and C.D. Johnson J. Geophys. Res. (accepted), 1994

"Estimation of EOF Expansion Coefficients from Incomplete Data. Deep Sea Research", Boyd, J.D., E.P. Kennelly, and P. Pistek. (accepted for publication) (1993)

"Evaluation of the Spartan Tight-Tolerance AXBT", Boyd, J.D. and R.S. Linzell, J. Atm. and Oc. Tech., 10(6).(1993).

"Temperature and Depth Accuracy of Sippican T-5 XBTS", Boyd, J.D. and R.S. Linzell, . Atm. and Oc. Tech.,(10), pp128-136 (1993)

"On the Temperature and Depth Accuracy of Sippican T-5 XBTS", Boyd, Janice and R.S. Linzell, J. Atmos. Ocenic. Tech. 1(1), pp128-136.(1993)

"Evidence for Eddy Formation in the Eastern Arabian Sea during the Southwest Monsoon", Boyd, J. D., J.G., D.R. Johnson, and J.C. Kindle, J. Geophys. Res. (accepted for publication) (1993).

"Interference Of Subsurface Thermohaline Structure From Satellite Measurements", Carnes, M.R., W.J. Teague, and J.L. Mitchell J. Atm. and Oc. Tech. (accepted for publication).(1993).

"Evaluation of Multichannel Wiener Filters Applied to Fine Resolution Passive Microwave Images of First-Year Sea Ice.Eppler", D. T. and William E. Full . Remote Sens. Environ. 44 pp. 1-23.(1993)

"Passive Microwave Signatures of Fractures and Sea Ice at 33.6 GHZ (Vertical Polarization) as Observed in Aircraft Images." Farmer, L.D., D.T. Eppler, and A.W. Lohanick (1993). J. Geophys. Res. 98, pp. 4645-4665, 1994.

"Sea Surface Height Fluctuations Observed Simultaneously with Inverted Echo Sounders and GEOSAT." Hallock, Z.R. and W.J. Teague J. Geophys. Res. 98(C9), pp. 16341-16349, 1994.

"Near Decadal Variability in Sea Surface Height from Multiple Altimeter Missions." Jacobs, G.A., J.L. Mitchell, and W.J. Teague J. Geophys. Res. (1993, accepted for publication).

"An Examination of the Dynamics of the Kuroshio Current Region Through GEOSAT Altimeter Data and a 1/8 degree. 6 Layer Pacific Ocean Model." Jacobs, G.A., W. J. Teague, J.L. Mitchell, and H.E. Hurlburt (1993). J. Geophys. Res. (accepted for publication), 1994.

"Remote Wind-Forcing in the Northwest Atlantic." Johnson, D.R. and Z. Hallock (1993). J. Geophys. Res. (accepted per revision).



"Electrochemical Techniques Applied to Studies of Micro- biologically Influenced Corrosion (MIC). Trends in Electro-Chemistry." Little, B. and F. Mansfeld (1993).

"Sulfur Isotope Fractionation by Sulfate-Reducing Bacteria in Corrosion Products." Little, B. and P. Wagner (1993). Biofouling, 6, pp. 279-288.

"Advantages of Environmental Scanning Electron Microscopy in Studies of Microorganisms." Little, B. -(with) S.P. Collins, R.K. Pope, R.W. Scheetz, R.I. Ray and P.A. Wagner (1993) Microscopy\_Research and Technique, 25, pp. 398-405.

"Indicators for Sulfate-Reducing Bacteria in Microbiologically Influenced Corrosion. American Chemical Society." Little, B.J. and P. Wagner, (in press).

"Peptide Interactions with Steel Surfaces: Inhibition of Calcium Carbonate Precipitation and Associated Corrosion." Little, B. -(with) Sikes and Mueller. Corrosion 49(10) pp. 829-835, 1994.

"Microwave Brightness Temperature of Laboratory-Grown Undeformed First-Year Ice With An Evolving Snow Cover," Lohanick, Alan L. J. Geophys. Res., 98(C3), pp. 4667-4674, 1994..

"Results from an Eddy-Resolving Model and GEOSAT in the Kuroshio Extension Region." Mitchell, J.L., W.J. Teague, G.A. Jacobs, H.E. Hurlburt, and P.J. Hogan (1993), J. Geophys. Res. (accepted for publication).

"Event Preceding the 1991-92 El Niño. Part I: A Study of Westerly Wind Bursts Depicted by an Operational Analysis/Forecast System," Phoebus, P.A. and J.C. Kindle (1993). J. Geophys. Res. (accepted for publication).

"Advantages of Environmental Scanning Electron Microscopy in Studies of Microorganisms." Ray, Richard I., Patricia A. Wagner, Brenda J. Little, Collins, Pope, Scheetz, Microscopy Research and Techniques 25 pp. 398-405, 1994.

"Bubble Size Distribution Under Saltwater and Freshwater Breaking Waves." Su, Ming Yang (with) J.W. Cartmill Dynamics of Atmospheres and Oceans, 20, pp. 25-31, 1994.

"Hydrographic Section Across the Kuroshio Near 35N, 153E." Teague, W.J., A.M. Shiller and Z.R. Hallock (1993). J. Geophys. Res. (in press).

"Impact of Alloying on Microbiologically Influenced Corrosion - A Review." Wagner, P. and B. Little, Materials Performance, 32(9), pp. 65-68, 1994.

"The Interrationship Between Marine Biofouling and Cathodic Protection," Wagner, P. -(with) B. Little, Materials Performance, 32(9), pp. 16-20, 1994.

"Advantages of Environmental Scanning Electron Microscopy in Studies of Algae and Fungi." Wagner, P. -(with) S.P. Collins, R.K. Pope, R.W. Scheetz, B.J. Little, and R.I. Ray, Microscopy Research and Technique 25, pp. 398-405, 1994.

"Sulfur Isotope Fractionation in Corrosion Products Produced by Sulfate-Reducing Bacteria." Wagner, P.-(with B. Little and J. Jones Biofouling, 6, pp. 279-288, 1994.

"Quantifying Absorption by Aquatic Particles: A Multiple Scattering Correction for Glass-Fiber Filters," Weidemann, A. and J. Cleveland (1st) Liminology and Oceanography 38(6), 1994.

"Evidence for Eddy Formation in the Eastern Arabian Sea During the Northeast Monsoon." Johnson, D.R. (with) J.C. Kindle and J.G. Bruce. J. Geophysical Research (accepted for publication).

"Laboratory Comparisons of Acoustic and Optical Sensors for Microbubble Measurement." Ming Yang Su, Douglas Todoroff, John Cartmill, J. of Atmospheric and Oceanic Technology, 11(1), 1994.

"On the Meridional Surface Profile of the Gulf Stream at 55 Degree W," Hallock, Zachariah R. Hallock, William J. Teague, Journal of Geophysical Research (accepted for publication).

"The Interrelationship Between Marine Biofouling and Cathodic Protection," Little, B.J. and P.A. Wagner, Materials Performance 32(9) pp. 16-20, 1994.

"The Suppression of Tide-Generated Non Linear Internal Wave Packets in the Strait of Gibraltar." Pistek, P. and P. La Violette. J. Geophysical Res. (accepted for publication).

"Microbiologically Influenced Degradation of Fiber-Reinforced Polymeric Composites." Wagner, P. R. Ray, and B. Little, Materials Performance 33(4) pp 46-49, 1994.

"Air in Predicting Hydrosol Backscatter from Remotely Sensed Reflectance," Weidemann, A., R. Stavn, and M. Wilcox. J. Geophysical Res. (accepted for publication).

"Physical Processes Affect Availability of Dissolved Silicate for Diatom Production in the Arabian Sea," Young, D.K. and J.C. Kindle., J. Geophysical Res. (accepted for publication).

"TEM Microfabric of Alaskan Bootlegger Cove Formation." Proc. of 1992 International Conference on Arctic Margins, Burkett, P.J., R.H. Bennett, H.R. Schmoll, and H.W. Olsen, Proceedings, (In Press) 1994.\*

"Geotechnical and Logging Evidence for Underconsolidation of Lau Basin Sediments: Rapid Sedimentation Versus Fluid Flow." Hawkings, J., Parson, L, Lavoie, D., Terry Burns, and Kathleen Fischer, J., Proc. Of The Ocean Drilling Program, Vol. 135, Part B, (In Press), Proceedings, 1994.\*

"Geotechnical Properties of Lau Basin Sediments from a Microfabric Perspective," Fischer, K. and Dawn Lavoie, Hawkings, J., Parson, L., and Allen J., Proc. of the Ocean Drilling Program, Vol. 135, Part B (In Press), Proceedings, 1994.\*

"Synthetic Seismograms, Migrated Seismic Reflection Profiles, and Lithologic Correlations for ODP Leg 135 Sites in the Lau Basin." Burns, T., E.L. Geist, and Dawn Lavoie, J., Proc. of the Ocean Drilling Program, Vol 135, Part B, (In Press), Proceedings, 1994.\*

"Bulk Permeability of Young Back-Arc Basalt in the Lau Basin from a Downhole Packer Experiment. ODP Leg 135, Hole 839B." Burns, T., and Dawn Lavoie, J., Proc. of the Ocean Drilling Program, Vol. 135, Part B (In Press), Proceedings, 1994.\*

"Evidence of Late Cenozoic Volcanic Activity in the West Antarctic Rift System Revealed by the CASERTZ Aeromagnetic Survey." Behrendt, J.C., D.D. Blankenship, C. Finn, R.E. Bell, R.E. Sweeney, S.M. Hodge, and J. M. Brozena, Geology (in press), 1994.

"Deep Ice Scour and Mass-Wasting Features on the Northern Svalbard Insular Shelf and Slope." Cherkis, N.Z., M.D. Max, A. Midthassel, K. Crane, E. Sundvor, and P.R. Vogt, Proc. Int. Conf. on Arctic Margins, Anchorage, AK, (Sept 1992) (in press) 1994.\*

"Vesteris Seamount: An Enigma in the Greenland Basin." Cherkis, N.Z., S. Steinmetz, R. Schreiber, J. Thiede and J. Theiner, Mar. Geophys. Res. (in press) 1994.

"Accuracy of Satellite Altimeter Elevations Over the Greenland Ice Sheet." Ekholm, S., R. Forsberg, and J.M. Brozena, J. Geophys. Res. B, 99 (in press) 1994.

"Methane-Generated (?) Pockmarks On Young, Thickly Sedimented Oceanic Crust In The Arctic: Vestnesa Ridge, Fram Strait." Vogt, P.R., K. Crane, E. Sundvor, M.D. Max, and S.L. Pfirman, Geology 22, 255-258, 1994.

"Shear  $\sigma$  Estimated From Interface Waves in Marine Sediments." Broadhead, M.K., H.B. Ale, and L. Dale Bibee, JASA, 95(3), p. 1650-1653, 1994.

"Percolation of Chains and Jamming Coverage in Two Dimensions by Computer-Simulation." Becklehimer, J.L. and Ras B. Pandey, J. Stat. Phys, (In Press), 1994.

"A Depauperate Benthic Assemblage from the Nutrient-Poor, Low-Shear Strength Sediments of the Puerto Rico Trench." Richardson, M.D., K.B. Briggs, F.A. Bowles and J.H. Tiefjen, Deep Sea Research (In Press), 1994.

"ONR Program Investigates the Coastal Benthic Boundary Layer." Richardson, M.D, 1994, EOS, (In Press), 1994.

"Magnetospheric and Ionospheric Signals in Magnetic Observatory Monthly Means: Electrical conductivity of the Deep Mantle." McLeod, M., Accepted for publication in JGR - Solid Earth on 17 March 1994.



e. Books/Chapters  
1990

"Radio Supernovae" R.A. Sramek, K.W. Weiler, **SUPERNOVAE**, Ed. A.G. Petschek, Springer Verlag; p. 76, 1990. [Book Chapter]

"Spectrum Analysis with Integrated Optics," Anthony E. Spezio, Springer-Verlag, Guided-Wave Acousto optics, Chapt. 7, 1990.

"Radio Supernovae," R. Sramek, K. Weiler, Radio Supervovae (Verlag Springer), Chapter 7, 1990.

"Sound and Vibration Damping with Polymers," R.D. Corsaro, J.F. Covey, R.M. Young, G. Spryn, Acoustic Coatings for Water-Filled Tanks, Chapter 11 in ACS Publications, 1990.

"Scientific Diving: A General Code of Practice," Flemming, N., and M.D. Max, (eds.) , 2nd Edition. UNESCO, Paris, France, and Florida Sea Grant Prog., Univ. Florida, 254 pp; 1990.

"Sound and Vibration Damping with Polymers," R.D. Corsaro and L. Sperling, editors, American Chemical Society Symposium Series 424, ACS Publications, 1990.

"Computational Aspects Of Matched Field Processing In Underwater Acoustics." A. Tolstoy, , published in Computational Acoustics Vol 3, p.303-310, Lee, Cakmak, and Vichnevetsky, ed., North-Holland, 1990.

"Computational Aspects Of Matched Field Processing In Underwater Acoustics," B.E. McDonald and W.A. Kuperman, "Reflection of Weak Shocks from a Fluid - Fluid Interface," Frontiers of Nonlinear Acoustics, ed. M. Hamilton and D. Blackstock, Elsevier Science Publishers, London, 1990.

"Self Refraction in Ducted Nonlinear Waves," B.E. McDonald and D.R. Plante, Frontiers of Nonlinear Acoustics, ed. M. Hamilton and D. Blackstock, Elsevier Science Publishers, London, 1990.

"Genetic-Algorithm-Based Learning," Kenneth A. De Jong, Machine Learning VIII, Y. Kodratoff and R. Michalski (eds.), Chapter 21, 611-638, Morgan-Kaufmann, 1990.

"Characteristics Of The Circulation In An Indonesian Archipelago Straits From Hydrology, Current Measurements, And Modeling Results," Murray, S.P., D. Arief, J.C. Kindle, and H.E. Hurlburt, "The Physical Oceanography of Sea Straits", Kluwer Academic Publishers, Boston, 3-23. pp. 3-23. (Refereed NATO Publication), 1990.

"Surface Reactive Peptides and Polymers," Little, Brenda and C. Steven Sikes, Corrosion Inhibition by Thermal Polyaspartate. Chapter 21 in book, pub. by American Chemical Society, Washington, D.C, 1990.

"The Physical Oceanography of Sea Straits," Murray, S.P., D. Arief, J.C. Kindle, and H.E. Hurlburt, Characteristics of Circulation in an Indonesian Archipelago Straits from Hydrology, Current Measurements, and Modeling Results., pub. by Kluwer Academic Publishers, Boston, pp3-23. (Referenced NATO publication.), 1990.

"Genetic Algorithms And Their Applications," John J. Grefenstette, The Encyclopedia of Computer Science and Technology, Vol. 21, A. Kent and J. G. Williams (eds.), New York: Marcel Dekker, 1990.

"CESA: An Expert Systems Application in Contracting." Jay Liebowitz and Laura Davis, Expert Systems Applications, Chapter 2, 49-53, I.I.I.T. International, 1990.

"Using Expert Systems to Help the Contracting Officer Technical Representative: A Feasibility Study." Jay Liebowitz, Laura Davis, and Wilson F. Harris, Educational Technology, 25-31, January 1990.

"Visualization in Scientific Computing." G. Nielson, B. Shriver, and L. Rosenblum, IEEE Computer Society Press, Los Alamitos, CA, Aug. 1990.

"Selective Hydrocarbon Activation: Principles and Progress," Z. H. Kafafi, "Metal Atom/Cluster Reactions via FTIR Matrix Isolation Studies: C-H vs C-C Bond Activation". eds. J. A. Davies, P. L. Watson, J. F. Liebman and A. Greenberg, VCH Publishers (New York), pp. 441, 1990.

"Fix-Points and Factorization of Meromorphic Functions," Chi-Tai Chuang, Chung-Chun Yang, Copyright 1990 by World Scientific Publishing Co. Pte. Ltd., ISBN 981-02-0008-0, 1990.

"The Rosslare Complex: a displaced terrane", Winchester, J.A., M.D. Max, and F.C. Murphy, Avalonian and Cadomian Geology of the North Atlantic, ed. by R.A. Strachan and G.K. Taylor, Chapman and Hall, NY., 49-64, 1990.

"Subseabed Disposal Project Experiment: Piezometer Probe Measurement Technology," Bennett, R.H., J.T. Burns, H. Li, P.J. Valent, C.M. Percival and J. Lipkin, p. 175-189, In: Geotechnical Engineering Of Ocean Waste Disposal, ASTM STP 1087, p. 310, 1990.

"Microfabric and Physical Properties Characteristics of a Consolidated Clay Section: OPD Site 697," Bryant, W.R., R.H. Bennett, P.J. Burkett, And F.R. Rack, Weddel Sea, In: Microstructure Of Fine-Grained Sediments: From Mud to Shale, Springer-Verlag, p. 582, 1990.

"Microfabric Of Illitic Clays From the Pacific Deep-Sea Basin: Significance To High Level Nuclear Waste Disposal." Burkett, P.J., R.H. Bennett, and W.R. Bryant, p. 276-296, In: Geotechnical Engineering of Ocean Waste Disposal, ASTM STP 1087, p. 310, 1990.

"Subseabed Disposal Project Experiment: Porewater Pressure Response to Piezometer And Canister Insertion." Valent, P.J., J.T. Burns, D.J. Walter, H. Li, And R. H. Bennett, p. 206-222, In: Geotechnical Engineering Of Ocean Waste Disposal, ASTM STP 1087, p. 310, 1990.

"Radar Handbook," M. I. Skolnik, Mc-GrawHill Book Co., Second Edition, with a Russian Translation, 1990.

"Sea Clutter", L. B. Wetzel, Chapter 13 in Radar Handbook, M. Skolnik, Ed. (McGraw-Hill, N.Y., N.Y.), 1990.

"Electron Spin Resonance," D. Griscom, in Glass Science and Technology, Vol. 4B, Advanced in Structural Analysis, editors; D. Uhlmann and N. Kreidl, Academic Press, pp. 151-251, 1990.

"Experimental Measurement of Very Small Angle Stray Light Optical Performance of Selected Acousto-optic Materials," J.C. Stover, D.R. Bjork, R.B. Brown, and J.N. Lee, published as book chapter in Growth and Characterization of Acousto-optical Materials, N.B. Singh, ed., TransTech Publications, Aederhanssdorf, Switzerland, August 1990.

"Electromagnetic Scattering from the Sea at Low Grazing Angles", L. B. Wetzel, Chapter 12 in Surface Waves and Fluxes; Volume II, Remote Sensing, G. L. Geernaert and W. J. Plant, Eds. (Kluwer Academic Publishers, Dordrecht) July, 1990.

Chapter 24 in Radar Handbook Second Edition, by James M. Headrick, 1990.

Chapter 8 in Radar Handbook Second Edition, by Dr. G. V. Trunk, 1990.

"An Analysis of the Interacting Roles of Population Size and Crossover in Genetic Algorithms." Kenneth A. Dejong and William M. Spears, Parallel Problem Solving from Nature: 1st Workshop (PPSN 1), v496, edited by H.-P. Schwefel and R. Manner, 38-47, Springer-Verlag., October 1990.

Porter, M., S. Piacsek, L. Henderson, and F. Jensen, "Acoustic Impact Of Upper Ocean Models. In Computational Acoustics", Vol. 1, ed. D.Lee, A. Cakmak, R. Vichnevetsky, North-Holland Publishers, p. 217, 1990.

e. Books/Chapters

1991:

"Observations of the Relative Contributions of Water-Borne and Sediment Paths to the Received Acoustic Signal." H.B. Ali and L.D. Bibee, Shear Waves in Marine Sediments, pp 185-193, 1991,

"A Seismo-Acoustic Finite Element Model for Underwater Acoustic Propagation." S.A. Chin-Bing (2nd) and J.E. Murphy (1st), Shear Waves in Marine Sediments, pp 463-470, 1991.

"Time Domain Solution from the Frequency Domain: Application to Resonance Scattering from Elastic Bodies." M.F. Werby and H. Ali, 2nd IMAC Conf. Book Chapter, Princeton, NJ, Vol. 2, pp 133-148, 1991.

"Strategies for the Solution of Scattering from an Object in a Wave-Guide: Some Numerical Examples." M.F. Werby, 2nd IMAC Conf. Book Chapter, Princeton, NJ, Vol. 2, pp 93-112, 1991.

"Sounding Rockets in Astronomy." G. Carruthers, Ref. Ency. Astronomy & Astrophysics, p. 650, 1991.

"Quasiperiodic Phenomena in Accreting Binary Stars." P. Hertz, J.P. Norris, Statistical Challenges in Modern Ast (B), pp. 367-377, 1991.

"On Metrics of 'Super Performance'." Y.S. Wu, International Digital Signal Processing Conference, Florence, Italy, 5 September 1991.

"Atmospheric Aerosols: Global Climatology and Radiative Characteristics", G.A. d'Almeida, P.Keopke, & E.P.Shettle, A.Deepak Publishing, Hampton, VA, 561 pp, 1991.

"Improving the Comprehensibility, Accuracy, and Generality of Reactive Plans." Diana F. Gordon, 6th International Symposium, ISMIS '91, Charlotte, N.C., Methodologies for Intelligent Systems, v542, edited by Z.W. Ras and M. Zemankova, 358-367. Springer-Verlag., October 1991.

"Strategy acquisition with genetic algorithms." John J. Grefenstette, Handbook of Genetic Algorithms, L. Davis (ed.), Chapter 14, 186-201, Van Nostrand Reinhold: Boston, 1991.

"Constraints on Shear Velocities in Deep Ocean Sediments as Determined From Deep-Tow Multichannel Seismic Data." Gettrust, J.F., and M.M. Rowe, Shear Waves In Marine Sediments, p. 369-378, 1991.

"Comparison Of Measured Compressional And Shear Wave Velocity Values With Prediction From Biot Theory." Briggs, K.B., Shear Waves In Marine Sediments, p. 121-130, 1991.

"Determinants of Clay and Shale Microfabric Signatures: Processes and Mechanisms." Bennett, R.H., N.R. O'Brien, and M.H. Hulbert, p.3-32, In: Microstructure of Fine-Grained Sediments: From Mud to Shale, Springer-Verlag, 582 p. 1991.

"Microstructure of Fine-Grained Sediments From Mud to Shale." Bennett, R.H., W.R. Bryant, and M.H. Hulbert, Preface to Edition by R.H. Bennett, Springer Verlag, 582 p. 1991.

"Shear Wave Gradients in Near-Surface Marine Sediment." Richardson, M.D., E. Muzi, B. Miaschi, and F. Turgutcan, Shear Wave In Marine Sediments, Kluwer Academic Publishers Dordrecht, The Netherlands, p. 295-304, 1991



"SSAMS: An In Situ Sediment Geoacoustic Measurement System." Shear Waves in Marine Sediments," Barbagelata, A., M.D. Richardson, B. Miaschi, E. Muzi, P. Guerrini, L. Troiano, and T. Akal, Kluwer Academic Publishers, Dordrecht, The Netherlands, p. 305-312, 1991.

"Comparison of Techniques for Shear Wave Velocity and Attenuation Measurements." Muir, T.G., T. Akal, M.D. Richardson, R.D. Stoll, A. Caiti and J.M. Hovem, Shear Waves In Marine Sediments, Kluwer Academic Publishers, Dordrecht, The Netherlands, p. 283-294, 1991.

"Laboratory Measurements of Acoustic Properties of Periplat Form Carbonate Sediments." Lavoie, D., Aubrey Anderson, Shear Waves In Marine Sediments, Eds, J. Hovem, M. Richardson, and R. Stoll, Kluwer Academic Publishers, Boston, MA, p. 111-120, 1991.

"The Role of the Microstructure of Red Clays in Radioactive Waste Disposal." Burkett, P.J., R.H. Bennett, and W.R. Bryant, p. 489-507, In: Microstructure Of Fine-Grained Sediments: From Mud To Shale, Springer-Verlag, 1991.

"Quantification of Clay Fabric - A Simple Technique." Chiou W.A., W.R. Bryant, and R.H. Bennett, p. 379-398, In: Microstructure Of Fine-Grained Sediments: From Mud To Shale, Springer-Verlag, 1991.

"The Significance of Sediment-Flow Dynamics on Clay Microstruture Development." Li, H. and R.H. Bennett, p. 193-202, In: Microstructure of Fine-Grained Sediments: Mud To Shale, Springer-Verlag, 1991.

"Shear Waves In Marine Sediments." Hovem, J.M., M.D. Richardson, and R. D. Stoll, Kluwer Academic Publishers, Dordrecht, The Netherlands, p. 596, 1991.

"Techniques for the Preparation of Submarine Sediments for Electron Microscopy." Bearwald, R., R.H. Bennett, and P.J. Burkett, p. 309-320, In: Microstructure of Fine-Grained Sediments: From Mud to Shale, Springer-Verlag, 582 p, 1991.

"Clay Fabric of Grassy Submarine Sediments." Chiou, W.A., W.R. Bryant, And R.H. Bennett, p. 333-352, In: Microstructure of Fine-Grained Sediments From Mud to Shale, Springer-Verlag, 1991.

"Underwater Acoustics." W.A. Kuperman, Encyclopedia of Applied Physics, American Institute of Physics, NYC, 1991.

"Observations Of Energy Partitioning Between Waterborne and Sediment Paths in Underwater Acoustic Propagation." Ali, H.B., and L.D. Bibee, Shear Waves In Marine Sediments, Eds, J. Hovem, M. Richardson, and R. Stoll, Kluwer Academic Publishers, Boston, MA, 1991.

"The Effect of Shear Velocity Structure on Seafloor Noise Statistics." Dorman, L.M., A.E. Schreiner, and L.D. Bibee, Shear Waves In Marine Sediments, Eds, J. Hovem, M. Richardson, and R. Stoll, Kluwer Academic Publishers, Boston, MA, 1991.

"Shear Wave Velocity Structure From Interface Waves at Two Deep Water Sites in The Pacific Ocean." Schreiner, A.E., L.M. Dorman, and L.D. Bibee, Shear Waves In Marine Sediments, Eds, J. Hovem, M. Richardson, and R. Stoll, Kluwer Academic Publishers, Boston, MA, 1991.

"Compressional and Shear Wave Velocities in the Upper Crust." Orest I. Diachok, Stephen C. Wales, Ronald Dicus, Fed Feirtag, David Shirley, amd John Siegel, Shear Waves in Marine Sediments, 387-394, J.M. Hovem et al. eds., Kluwer Academic Publishers, Netherlands, 1991.

- "Three-Dimensional Ocean Acoustic Modeling in Oceans with Mesoscale Features." W.A. Kuperman, J. Perkins, and R.B. Evans, in Oceanography and Acoustics, Robinson et al (eds.), Harvard Press, 1991.
- "Physical Effects and Numerical Simulation of X-Ray Transport in Plasmas", J. P. Apruzese, Computer Applications in Plasma Science and Engineering, Springer-Verlag, p. 359, 1991.
- "Comments on Ionization Dynamics, Radiation Emission, and Dense Plasma Effects in Hot Plasmas", J. Davis, Computer Applications in Plasma Science and Engineering, Springer-Verlag, p. 326, 1991.
- "Symmetry and Stability Physics in Laser", S.E. Bodner, Handbook of Plasma Physics, M.N. Rosenbluth, R.Z. Sagdeev, eds., Vol. 3, p. 247, 1991.
- "A Parametric Study of the Solar Wind Interaction with Comets", C.T. Russell, G. Le, J.G. Luhmann, J.A. Fedder, Geophysical Monograph, No. 61, American Geophysical Union, p. 65, 1991.
- "Role of Small Scale Processes in Global Plasma Modelling", G. Ganguli, Y.C. Lee, P.J. Palmadesso, Geophysical Monograph No. 62, American Geophysical Union, p. 17, 1991.
- "Turbulence in Very-High Mach Number, Laser-Accelerated Material", J. Grun, J. Stamper, J. Crawford, C. Manka, B.H. Ripin, Laser Interaction and Related Plasma Phenomena, H. Hora, G. Miley, eds., Vol. 9, p. 297, 1991.
- "Charged Particle Beam Propagation", M. Lampe, G. Joyce, Computer Applications in Plasma Science and Engineering, Springer-Verlag, p. 148, 1991.
- "The Source Dependent Expansion Method and Radiation Focusing in the Free Electron Laser." A. Ting, P. Sprangle, C. Tang, Computer Applications in Plasma Science and Engineering, A.T. Drobot, ed., p. 272, 1991.
- "Arctic Ocean." Crane, K., P. Vogt, and E. Sundvor, in McGraw Hill Yearbook of Science and Technology, 1992, McGraw-Hill, New York, 24-30, 1991.
- "Corrosion Inhibition by Thermal Polyaspartate." Little, Brenda and C. Steven Sikes, Book Chapter, Surface Reactive Peptides and Polymers, American Chemical Society, pp 263-279, 1991.
- "Some Markov Chain Problems in the Evaluation of Multiple-Access Protocols." J. E. Wieselthier and A. Ephremides, Numerical Solution of Markov Chains, ed. W. Stewart, pp. 239-260, Marcel Dekker, Inc., 1991.
- "Purification and Analysis of Heavy Metal Fluorides." K. Ewing and J. Sommers, published in Fluoride Glass Fiber Optics, Academic Press, pp. 141-211, 1991.
- "Effects of High Energy Radiation on Halide Glasses", D. Griscom and E. Friebele, published in Fluoride Glass Fiber Optics, Academic Press, pp. 307-350, 1991.
- "Introduction and Conclusion for "Fluoride Glass Fiber Optics", Aggarwal and Grant Lu, published in Fluoride Glass Fiber Optics, Academic Press, pp. xi-xiv and 397-398, 1991.
- "Fluoride Glass Fiber Optics", I. Aggarwal and Grant Lu, Book published by Academic Press, 1991.

"Radiation Effects", E. Friebele, published in Optical Properties of Glass, Editors, D. Uhlmann and J. Kreidl, Am. Ceram. Soc., pp. 205-262, 1991.

"Conditions for Implicit Parallelism." John J. Grefenstette, Foundations of Genetic Algorithms, edited by Gregory J.E. Rawlins, 252-261, Morgan Kaufmann., 1991.

"Strategy Acquisition with Genetic Algorithms." John J. Grefenstette, Handbook of Genetic Algorithms, edited by Lawrence Davis, Chapter 14, 186-201, Van Nostrand Reinhold, 1991.

"A Study of Crossover Operators in Genetic Programming." William M. Spears and Vic Anand, 6th International Symposium, ISMIS '91, Charlotte, N.C., Methodologies for Intelligent Systems, v542, edited by Z.W. Ras and M. Zemankova, 409-418, Springer-Verlag, October 1991.

"X Window System Programming." Naba Barkakati, SAMS - A Division of Macmillan Computer Publishing, 1991.

"Object-Oriented Programming in C++," Naba Barkakati, SAMS - A Division of Macmillan Computer Publishing, 1991.

e. Books/Chapters  
1992:

"Recent Developments in Scattering from Submerged Elastic and Rigid Targets," M.F. Werby, Resonance Scattering, 1992.

"Transient Resonance Scattering from Bounded Elastic Bodies," M. Werby and J.W. Dickey, Acoustic Resonance Scattering, 1992.

"The Classical Scattering of Waves: Some Analogies with Quantum Scattering," M.F. Werby, Computational Quantum Physics, American Institute of Physics, NY, 1992.

"Microwave Remote Sensing of Sea Ice," Eppler, D.T., D. Farmer, A. Lohanick, M. Anderson, Caren Garrity, T. Grenfell, M. Hallikainen, J. Maslanik, C. Matzler, R. Melloh, I. Rubinstein, and C. Swift: Chapter 4: Passive Microwave Signatures of Sea Ice, 1992.

"Modeling the Oceanic Planetary Boundary Layer," McWilliams, J.C., P.C. Galalcher, C. -H. Moeng, and J.C. Wyngaard in Large Eddy Simulations of Complex Engineering and Geophysical Flows, to be published by Cambridge University Press, 1992.

"Airborne Gravimetry," Brozena, J.M., in CRC Handbook of Geophysical Exploration at Sea, Ed. by R.A. Geyer, Chapt. 4, CRC Press, Boca Raton, FL., 1992.

"Regional Gravity Anomalies And Geoid Undulations In The North Atlantic Ocean", Jung, W-Y., and P.D. Rabinowitz in Handbook of Geophysical Exploration at Sea, ed. by Richard A. Geyer, CRC Press, p. 81-104, 1992.

"Geoacoustic and Geological Characterization of Surficial Marine Sediments by In Situ Probe and Remote Sensing Techniques," Bennett, R.H., H. Li, M.D. Richardson, P. Fleischer, D.N. Lambert, D.J. Walter, K.B. Briggs, C.R. Rein, W.B. Sawyer, F.S. Carnaggio, D.C. Young and S.G. Tooma in CRC Handbook of Geophysical Exploration at Sea, 2nd Ed., Hydrocarbons, CRC Press, Boca Raton, p. 295-350, 1992.

"Significance of Pore Pressure in Marine Sediments Measurements and Derived Properties," Li, H., M.C. Wang, And R.H. Bennett, p. 339-381, In CRC Handbook Of Geophysical Exploration at Sea, 2nd Ed, V.2, Hard Minerals, 520 p. 1992.

"A First Principles Investigation of Aluminum Clusters: Geometries, Reactivities, Stabilities and Polarizabilities," M.R. Pederson, Physics and Chemistry of Finite Systems: From Clusters to Crystals, P. Jena, et al., eds., (Kluwer Publishers, 1992) p. 861.

"Scattering of Sound Pulses and the Ringing of Target Resonances," Susan K. Numrich and Herbert Uberall, Chapter 2 (of 2), in High Frequency and Pulse Scattering, Physical Acoustics Vol XXI, ed. by Allan Pierce and R. N. Thurston, Academic Press, Inc., New York, 1992.

"Hopfield Model And Optimization Problems," Behrooz Kamgar-Parsi and Behzad Kamgar-Parsi, in Neural Networks for Human and Machine Perception, edited by H. Wechsler, Academic Press, Orlando, FL, 1992, vol. 2, pp. 89-110, 1992.

"Methods for Magneto-Transport Characterization of IR Detector Materials," J. R. Meyer, C. A. Hoffman, F. J. Bartoli, D. Arnold, S. Sivananthan and J. P. Faurie, Workshop on Measurement Techniques for Characterization of HgCdTe Materials, Processing, and Detectors, Danvers, MA and published in Book Chapter, Oct 92.

"Novel Electronic Processes in Mercury-Based Superlattices", J. R. Meyer, C. A. Hoffman and F. J. Bartoli, Chapter for Book - II-VI Semiconductor Compounds, edited by M. Jain, 1992.

"Infrared Focal Plane Array Technology", D. A. Scribner, M. R. Kruer and J. M. Killiany, Reprint Book SEMICONDUCTOR INFRARED DETECTORS, edited by Dr. A. Rogalski, 1992.

"Handbook on Semiconductors." J. R. Meyer, C. A. Hoffman, T. H. Myers and N. C. Giles, Vol. 3, 2nd edition, edited by S. Mahajan, Elsevier Science, Publications, Amsterdam, The Netherlands, June 1992.

"Gas Scavenging of Simulated Pesticides by Evaporating Water Drops in an Acoustic Levitation Wind Tunnel", M. Seaver and J. Peele, published in a book titled Precipitation Scavenging and Atmosphere-Surface Exchange, Vol 1- The Georgii Volume: Precipitation Scavenging Process, p. 41, 1992.

"Methods for Magneto-Transport Characterization of IRDetector Materials", J. R. Meyer, C. A. Hoffman, F. J. Bartoli, D. Arnold, S. Sivananthan, J. P. Faurie, Workshop on Measurement Techniques for Characterization of HgCdTe Materials, Processing, and Detectors, Danvers, MA (Oct 92) and published in Book Chapter, 1992.

"Role of Air-Sea interaction processes on the Indian SW monsoon Dynamics", Alapati, K., S. Raman and R.V. Madala. A paper published in a book entitled Oceanography of India Ocean. Published by Oxford & IBH Publishing Co. January 1992.

"Effect Of Grid Resolution On The Simulation Of Orographically Induced Precipitation." Alapati, K., R.V.Madala and S.Raman, An article in a book entitled Physical Processes in Atmospheric Models. Published by Wiley Eastern Limited, 373-384, 1992.

"Numerical simulation of Indian Southwest Monsoon Rainfall using Kuo and Betts Cumulus Parameterization Schemes." Alapati, K., S.Raman, R.V.Madala and J.J. Baik, An article in a book entitled Physical Processes in atmospheric Models. Published by Wiley Eastern Limited, 137-148, 1992.

"Crossover or Mutation?" William M. Spears, Foundations of Genetic Algorithms 2, D. Whitley (editor), Morgan Kaufmann, July 1992.

"Learning Decision Strategies with Genetic Algorithms." John J. Grefenstette, Analogical and Inductive Inference, K.P. Jantke (editor), Vol. 642, Springer-Verlag, 35-50, 4-9, October 1992.

"Genetic Algorithms for Changing Environments." John J. Grefenstette, Parallel Problem Solving from Nature -2, R. Manner & B. Manderick (editors), North-Holland, 137-144, 28-30, September 1992.

"Deception Considered Harmful." John J. Grefenstette, Foundations of Genetic Algorithms, 2, D. Whitley (editor), Morgan Kaufman, 1992.

"Is the Genetic Algorithm a Cooperative Learner?" Helen G. Cobb, Foundations of Genetic Algorithms 2, D. Whitley (editor), Morgan Kaufmann, 1992.

"Hopfield Model and Optimization Problems." Behrooz Kamgar-Parsi and Behzad Kamgar-Parsi, Book Chapter, Neural Networks for Perception, Volume 2, Harry Wechsler (editor), Chapter III.4, 94-110, 1992.

e. Books/Chapters  
1993:

"Sound Propagation in the Ocean Environment," S.A. Chin-Bing, Intro. to High-Performance Computing, 1993.

"Ultraviolet and X-Ray Detectors," G Carruthers, Electro Optics Handbook, pp. 15.1-16.1, 1993

"Composition, Propagation and Reacceleration of Cosmic Rays," R. Silberberg, C.H. Tsao, J.S. Rife, Particle Astrophysics and Cosmology, pp. 1-16, 1993.

"Deep-Water Sea-Floor Array Observations of Seismo-Acoustic Noise in the Eastern Pacific and Comparisons with Wind and Swell," Dorman, L.M., A.E. Schreiner, L.D. Bibee and J.A. Hildebrand, Natural Physical Sources of Underwater Sound, Ed. B.R. Kerman, Kluwer, The Netherlands, 1993.

"Internal Stratigraphy and Organic Facies of the Devonian-Mississippi in Chattanooga (Woodford) Shale in Oklahoma and Kansas," Lambert, M.W., B. Katz and L. Pratt, Editors, American Associates of Geologist, Studies in Geology, #37, p. 163-176, 1993.

"Measurement, Characterization, And Modeling Of Ice And Bottom Backscattering And Reverberation In The Arctic Ocean," T. C. Yang and T. Hayward, Ocean Reverberation, pp 161-166, edited by D.D. Ellis, J. R. Preston and H. G. Urban, Kluwer Academic Publishers, 1993.

"Radiative Recombination of Free Excitons in GaAs Quantum Wells", Katzer, D. S., Springer Series in Chemical Physics, Volume 55, Pages 472-474, 1993.

"Quasi-Two Dimensional Electrons in AlSb/InAs Quantum Wells," Lin-Chung, P. J., Yang, M. J., The Physics of Semiconductors, World Scientific Co., Page 745, 1993.

"Phonon Assisted Optical Properties of Semiconductor Nanostructures", Reinecke, T. L., Phonons in Semiconductor Nanostructures, (NATO/ASI Series), J. P. Leburton et al. (eds), Pages 353-361, 1993.

"The Coupling Model for Cooperative Relaxations and Its Applications," Rendell, R. W., Ngai, K. L., Macromolecules 1992, Pages 83-95, 1993.

"Polymerizable Phospholipids", A. Singh and J.M. Schnur in Phospholipid Handbook, G. Cevc, ed., Marcel Dekker, Inc., NY, pp. 233-291, 1993.

"High Resolution Patterning With the STM", C.R.K. Marrian, E.A. Dobisz, and J.M. Calvert, in Atomic and Nanoscale Modification of Materials: Fundamentals and Applications, P. Avouris, ed., Kluwer Academic Publishers, pp. 139-148, 1993.

"Polymerizable Phospholipids: Versatile Building Blocks for Novel Biomaterials", A. Singh and J.M. Schnur, in Membrane Mimetic Chemistry and its Applications, 1993.

"Enzyme Immobilization on Polymerizable Phospholipid-Assemblies", A. Singh, M. Markowitz, L.-I. Tsao, and J. DeSchamps, in Polymeric Materials in Biosensors and Diagnostics, A.M. Usmani, ed., ACS Publications, Washington, DC, 1993.

"Controlled Release From Liposomes of Long Chain Diacetylenic Phosphocholine and Short Chain Saturated Phospholipid", M. Markowitz, E.L. Chang, and A. Singh, in Polymeric Materials in Biosensors and Diagnostics, A.M. Usmani, ed., ACS Publications, Washington, DC, 1993.

"Rapid Solidification Processing with Specific Application to Aluminium Alloys," E.J. Lavernia, J.D. Ayers; T.S. Srivatsan, Rapid Solidification Technology, An Engineering Guide, Edited by T.S. Srivatsan, and T.S. Sudarshan, Technomic Publishing Co., Inc., pp 301-408, 1993.

"Structural Origins of Magnetic Anisotropy in Amorphous Non-S-State Rare Earth - Transition Metal Films." V.G. Harris, W.T. Elma, and N.C. Koon, High Density Digital Recording, K.H.J. Buschow et al. (eds.), Chapter 18, Kluwer Academic Publishers, 483-517, 1993.

"The Dendrite." M.E. Glicksman (Rensselaer Polytechnic Institute), and S.P. Marsh, Handbook of Crystal Growth, Vol. 1, Part B: Transport and Stability, edited by D.T.J. Hurle, Elsevier Science Publishers B.V., Chapter 15, 1993.

"The Hall Effect X-Ray Photoelectron Diffraction." A.C. Ehrlich, The Electrical Engineer Handbook, Editor in Chief, R.C. Dorf, Chapter 49, CRC Press, p 1106, 1993.

"Three-Dimensional Magnetic Reconnection in a Coronal Neutral Sheet." R.B. Dahlburg, S.K. Antiochos, and T.A. Zang, Physics of Solar and Stellar Coronae: G. S. Vaiana Memorial Symposium, ed. J.L. Linsky and S. Serio, Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 611-614, 1993.

"Hydrocarbon Clusters: Building Blocks for New Materials." M.R. Pederson, K.A. Jackson, W.E. Pickett, B.M. Klein, On Clusters and Clustering: From Atoms to Fractals, Ed. P.J. Reynolds (Elsevier, 1993), p. 157.

"Perturbation Analysis and 'Rapid Learning' in the Control of Manufacturing Systems." C. G. Cassandras, C. T. Leondes, Academic Press, 1993.

"Eye Movement-Based Human-Computer Interaction Techniques: Toward Non-Command Interfaces." R. Jacob pp. 151-190 in Advances in Human-Computer Interaction, Vol. 4, ed. H.R. Hartson and D. Hix, Ablex Publishing Co., Norwood, N.J, 1993

"Electron Spin Resonance Spectroscopy of Radiation-Induced Defect Centers in Insulating Glasses", D. Griscom, Experimental Techniques of Glass Science, C. J. Simmons and O.H. El-Bayoumi, Eds. (American Ceramic Society, Westerville, OH, 1993) PP. 161-184, 1993.

"Novel Electronic Processes in Mercury-Based Superlattices", J. R. Meyer, C. A. Hoffman and F. J. Bartoli, in II-IV Semiconductor Compounds, ed M. Jain, Chapter 13, (World Scientific, London, 1993).

"Type III Superlattices for Long-Wavelength Infrared Detectors: The HgTe/CdTe System" T. H. Myers, J. R. Meyer and C. A. Hoffman, in Quantum Wells and Superlattices for Long Wavelength Infrared Detectors, ed. M. O. Manasreh, Cartech House, Boston, Chapter 6, 1993.

"Mechanisms of Conventional and High Tc Superconductivity." V.Z. Kresin, H. Morawitz, S.A. Wolf Oxford University Press, 1993.

R. Griffin and J. Lee, "Acousto-Optic Wide Band Correlator System," submitted chapter for publication in Acousto-Optic Signal Processing, 2nd Edition by Marcel Dekker, 1993.

"Undersea Imaging: The Interplay Between Visualization And Science." L. Rosenblum, B. Kamgar-Parsi, and K. Stewart, Guest Editor, Special Issue on Visualization, IEEE Computer Graphics and Applications, Vol. 13, No. 4, July 1993 (with Arie Kaufman, Greg Nielson), 1993.

"Undersea Visualization: A Tool For Scientific And Engineering Progress." L.J. Rosenblum, W.K. Stewart, and Behzad Kamgar-Parsi, in Animation and Scientific Visualization, edited by R.A. Earnshaw and D. Watson, Academic Press, San Diego, CA, 1993, pp. 205-223, 1993.

"Polarization control with PM fiber", W.K. Burns Optical Fiber Rotation Sensing JFW 7/7/93, SER 5670-8082 Bk. chapter, Pub., Chapt. #6, Oct. 93.

"Rare Earth Doped Heavy-Metal Fluoride Glass Fibers", J Sanghera, I. Aggarwal, for publication in Rare Earth Doped Fibers and Devices, ed. M. Digonnet, published by Marcel Dekker, New York, 1993.

"Alkaline Earth Gallogermanate Glasses", J. Jewell, for publication in Rare Elements in Glasses, Trans Tech. Publication, LTD, Aedermannsdorf, Switzerland, 1993.

"Lithographically Patterned Self-Assembled Films", J.M. Calvert, in Organic Thin Films and Surfaces, invited paper, A. Ulman, ed., Academic Press, 1993.

Matched Field Processing in Underwater Acoustics, A. Tolstoy, World Scientific Publishing (1993).

"Maximizing Matched Field Processing Output Used In A New Approach To Ocean Acoustic Tomography" A. Tolstoy and L.N. Frazer, published in Computational Acoustics Vol 2, Lee, Robinson, and Vichnevetsky, ed., North-Holland, pg. 79-84, 1993.

"Magnetic and Tectonic Fabric of the North Fiji Basin and Lau Basins." Malahoff, A., L.W. Kroenke, N.Z. Cherkis, and J.M. Brozena, in Kroneke, L.W. and Eade, J.V. (eds.), 1993, Basin Formation, Ridge Crest Processes and Metallogenesis in the North Fiji Basin: Circum-Pacific Council for Energy and Mineral Resources, Earth Science Series 15, Springer-Verlag, NY, 67-82, 1993.

"Natural gas hydrates." Max, M.D., A. Lowrie, in: T.O. Vorren, E. Bergsager, O.A. Dahl-Stamnes, B. Johansen, E. Lie and T.B. Lund, (eds), Arctic Geology and Petroleum Potential, Proc. Norw. Petrol. Soc. Conf., 15-17 August 1990, Elsevier Sci. Publ. Amsterdam. 27-53, 1993.

"Mass Spectrometric Investigations of Cluster Ions", S.W. McElvany and M.M. Ross, in On Clusters and Clustering, From Atoms to Fractals, P.J. Reynolds, Editor, Elsevier, 1993.

"Nuclear Magnetic Resonance Imaging of Anisotropic Solid-State Chemical Reactions", L.G. Butler, D.G. Cory, J.B. Miller, K.M. Dooley and A.N. Garroway, Chapter 18, Selectivity in Catalysis, ACS Symposium Series 517, 1993.

"Predicting Properties of Fullerenes and Their Derivatives", C.T. White, J.W. Mintmire, R.C. Mowrey, D.W. Brenner, D.H. Robertson, J.A. Harrison and B.I. Dunlap, Buckminsterfullerenes, Ch. 6, 125, 1993.

"Advances in Low-Carbon High Strength Ferrous Alloys." LCFA-92, O.N. Mohanty, B.B. Rath, M.A. Imam, and C.S. Sivaramakrishnan, Trans Tech Publications, 1993.

"Continuous Fiber Reinforced Ceramic Matrix Composites: A Historical Overview," D. Lewis, III, Handbook on Continuous Fiber Reinforced Ceramic Matrix Composites, Corrosion Basics and Computer Modeling  
V.G. DeGiorgi, Industrial Applications of the Boundary Element Method, Editors: C.A. Brebbia, and M.H., Aliabadi, Computational Mechanics Publications, Chapter 2, Sept. 1993.





e. Books/Chapters  
1994:

"Shear Wave Properties from Inversion of Multi-Model Scholte Wave Data: Potential and Pitfalls," H.B. Ali and M.K. Broadhead, Proceedings of Full Field Inversion Methods in Ocean & Seismic Acoustics, to be published in June 1994.

"New Human-Computer Interaction Techniques," R. Jacob, Human-Machine Communication for Educational Systems Design, ed. M. D. Brouwer-Janse and T. Harrington, Springer-Verlag, Amsterdam, 1994 in press.

"Eye Tracking in Advanced Interface Design," R. Jacob, Advanced Interface Design and Virtual Environments W. Barfield and T. Furness, Oxford University Press, Oxford, (1994). (in press; to be published simultaneously in Japanese).

"Natural Dialogue in Modes Other Than Natural Language," R. Jacob, Natural Dialogue and Interactive Student Modelling, ed. R.-J. Beun, Springer-Verlag, Amsterdam, (1994). (in press).

"Inference Problems in Multilevel Secure Database Management Systems," Sushil Jajodia and Catherine Meadows in Information Security: An Integrated Collection of Essays, M. Abrams, H. Podell, and S. Jajodia, eds., to appear.

"Security Models," J. McLean Encyclopedia of Software Engineering (ed. J. Marciniak), Wiley Press, 1994.

"Frozen Orbit Morphology In Orlov's Plane," (AAS 93-695), to appear Astrodynamics 1993, Vol. 85, Advances in the Astronautical Sciences (Univelt, San Diego, CA, 1994)

"Geolocation Accuracy of HERCULES on STS 53," (AAS 93-604), with M.T. Soyka, H.M. Pickard, S.N. Lam, K.H. Little, R.R. Dasenbrock and T.W. Murphy, to appear Astrodynamics 1993, Vol. 85, Advances in the Astronautical Sciences (Univelt, San Diego, CA, 1994)

"Satellite Attitude Determination With Gps," (AAS 93-556), with A.S. Hope, to appear Astrodynamics 1993, Vol. 85, Advances in the Astronautical Sciences (Univelt, San Diego, CA, 1994)

"Integrity in Multilevel Secure Database Management Systems," Catherine Meadows and Sushil Jajodia, Information Security: An Integrated Collection of Essays, M. Abrams, H. Podell, and S. Jajodia, eds. to appear.

"Progress And Problems In Ocean Visualization," L.J. Rosenblum and Behzad Kamgar-Parsi, in Data Visualization: Research Issues, Applications and Future Directions, edited by R. Earnshaw and L. Rosenblum, Academic Press, in press, 1994.

"Atmospheric Aerosols: Global Climatology and Radioactive Characteristics", G.A. d'Almeida, P. Keopke, E.P. Shettle, to be published by A. Deepak Publishing, Hampton, VA, 1994.

"Limits On The Performance Of Optical Processors Due To Optical Design Constraints And Stray Light From Scatter And Diffraction," J.N. Lee, R. B. Brown, to be published in Design Issues in Optical Processing, Cambridge University Press, John N. Lee, Editor, 1994.

"Materials for Spatial Light Modulators", P.B. Rolsma and J.N. Lee, to be published in Optical Signal Processing, Academic Press, 2nd edition, J. Horner, Editor, 1994.

"Alkaline Earth Gallogermanate Glasses" J. Jewell, for publication in Rare Elements in Glasses, Trans Tech. Publication, LTD, Aedermannsdorf, Switzerland, 1994.

"Rare Earth Doped Heavy-Metal Fluoride Glass Fibers" J. Sanghera , I. Aggarwal, for publication in Rare Earth Doped Fibers and Devices, ed. M. Dignonet, published by Marcel Dekker, New York, 1994.

"Rare Earth Doped Heavy-Metal Fluoride Glass Fibers" J. Sanghera, I. Aggarwal, for publication in Rare Earth Doped Fibers and Devices, ed. M. Dignonet, published by Marcel Dekker, New York, 1994.

"Limits On The Performance Of Optical Processors Due To Optical Design Constraints And Stray Light From Scatter And Diffraction." R. B. Brown, J. N. Lee, to be published in Design Issues in Optical Processing, Cambridge University Press, John N. Lee, editor (in Press).

"Materials for Spatial Light Modulators," J. Lee, for publication in Real Time Optical Information Processing, Academic Press, B. Javidi and, J. Horner, editors, 4/16/93 (in Press).

"Surface Duct Propagation And The Ocean Mixed Layer." Porter, M., S. Piacsek, L. Henderson, and F. Jensen, In Coupled Ocean Prediction and Acoustic Propagation Models, ed. A. Robinson and D. Lee, American Inst. of Physics (in press).

"Chemical Mechanisms of Diamond CVD", P.E. Pehrsson, F.G. Celii and J.E. Butler, Diamond Films and Coatings Development, Properties, and Applications, ed. R.F. Davis, Ed., Noyes Publications, Ch. 3, 68,1994.

"Frozen Orbits for Satellites Close to an Earth-like Planet." Coffey, S., Deprit, A. and Deprit, E., Celestial Mechanics, May, 1994.

"Marine Coatings", R.F. Brady, Jr., Kirk-Othmer Encyclopedia of Chemical Technology, Wiley, New York, Vol 6, pp.746-760, 1994.

"The Dynamics of the Seasonal Variability of the Western Mediterranean Circulation." Heburn, G.W., In The Seasonal and Interannual Variability of the Western Mediterranean Sea, ed by LaViolette. AGU Monograph (In Press).

"The Effects of Ocean Environmental Variability on Underwater Acoustic Propagation Forecasting." Chin-Bing, S.D. King, and J.D. Boyd. Book Chapter In: Coupled Ocean Prediction and Acoustic Propagation Models, A.R. Robinson and D. Lee, eds (accepted for publication).

"Trends in MIC Testing." Little, B. and P. Wagner, Trends in Corrosion Research, (book, in press).

"Acousto-Optic Wide Band Correlator System." R. Griffin and J. Lee, submitted chapter for publication in Acousto-Optic Signal Processing, 2nd Edition by Marcel Dekker, 1994.

"Support Jamming." CG/AS Countermeasures Handbook for Air Survivability, Chapter 33, J. G. Constantine, Gerard Gross, D. Howard, Government Printing Office for the U.S. Air Force, May 1994.

"Fatigue of Oxide Dispersion-Strengthened Alloys." K. Sadananda, Mechanical Properties of Metallic Composites, Edited by S. Ochiai, Marcel Dekker, Inc., Chapter 5, pp 75-96, 1994.

"Processing and Mechanical Behavior of Oxide Matrix Composites", D. Lewis, in High Temperature Composites, ed. R. J. Dievendorf et. al., Butterworth-Heinemann, 1994.

"Recent Developments and Future Prospects for XD™ and Lanxide™ In Situ Composite Materials." D. Lewis III; M. Singh (NASA Lewis Research Center) In-Situ Composites: Science and Technology, Edited by M. Singh and D. Lewis, The Minerals, Metals and Materials Society, pp 21-36, 1994.

"Self-Assembling Tubules from Phospholipids", R. Shashidhar and J.M. Schnur, in Molecular Electronics, Birge, ed., ACS Publications, Washington, DC, in press.

"Low Frequency Bathymetric Effects on Long-Range MFP Signal Performance in the Northeast-Pacific" J.F. Smith, III, O. Diachok, R. Heitmeyer, and E. Livingston, in Full Field Inversion Methods in Ocean and Seismic Acoustics, edited by O. Diachok, A. Caiti, P. Gerstoft, H. Schmidt., Kluwer Academic Publishers, accepted, 1994.

"Optimizing Experimental Design for Shallow Water Sound Speed Inversion." N.C. Makris, S.P. Heckel, J.S. Perkins, J. Catipovic, Full Field Inversion Methods in Ocean and Seismic Acoustics Conference (SACLANT), A. Caiti, P. Gerstoft, H. Schmidt., Kluwer Academic Publishers, Accepted 1994

"Propagation and Inversion in Complex Ocean Environments." M.D. Collins, W.A. Kuperman, Full Field Inversion Methods in Ocean and Seismic Acoustics Conference (SACLANT), A. Caiti, P. Gerstoft, H. Schmidt., Kluwer Academic Publishers, Accepted 1994.

"Direct and Inverse Wave Propagation in the Frequency Domain via the Dirichlet To Neumann Operator Symbol." L. Fishman, M.D. Collins, Full Field Inversion Methods in Ocean and Seismic Acoustics Conference (SACLANT), A. Caiti, P. Gerstoft, H. Schmidt., Kluwer Academic Publishers, Accepted 1994.

"Geoacoustic Inversion and Focalization in Shallow Water Environment." A. Fristensen, A. Caiti, F. Ingenito, M. Max, J. Berkson, M. Collins, L. Fialkowski, N. Makris, B. McDonald, J. Perkins, Full Field Inversion Methods in Ocean and Seismic Acoustics Conference (SACLANT), A. Caiti, P. Gerstoft, H. Schmidt., Kluwer Academic Publishers, Accepted 1994.

"The Spectral Elastic Parabolic Equation Method." G.J. Orris, M.D. Collins, Full Field Inversion Methods in Ocean and Seismic Acoustics Conference (SACLANT), A. Caiti, P. Gerstoft, H. Schmidt., Kluwer Academic Publishers, Accepted 1994.

"Seafloor Atlas of the Norwegian-Greenland Sea", Crane, K. and Anders Solheim, eds., Norsk Polarinstitut Meddeleser 131, (in press). 1994.