

1976

Florida Technological University College of Natural Sciences research activities, July 1, 1975-June 30, 1976

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COLLEGE OF NATURAL SCIENCES

**RESUME OF
RESEARCH ACTIVITIES**

JULY 1, 1975 - JUNE 30, 1976

F L O R I D A T E C H N O L O G I C A L U N I V E R S I T Y

C O L L E G E O F N A T U R A L S C I E N C E S

R E S E A R C H A C T I V I T I E S

July 1, 1975

through

June 30, 1976

Florida Technological University

College of Natural Sciences

P. O. Box 25000

Orlando, Florida 32816

DM 1 7. 34.49

T A B L E O F C O N T E N T S

	<u>PAGE</u>
INTRODUCTION	1
FUNDED RESEARCH:	
Biological Sciences	2
Chemistry	11
Physics	15
NONSPONSORED RESEARCH:	
Biological Sciences	16
Chemistry	22
Mathematical Sciences	26
Physics	30
PRESENTATIONS OF PROFESSIONAL PAPERS:	
Allied Health Sciences	33
Biological Sciences	34
Chemistry	37
Mathematical Sciences	38
Physics	39

T A B L E O F C O N T E N T S

	<u>PAGE</u>
PUBLICATIONS:	
Allied Health Sciences	40
Biological Sciences	41
Chemistry	44
Mathematical Sciences	45
Physics	46

I N T R O D U C T I O N

It is a pleasure for me to present this summary of the research activities of the faculty of the College of Natural Sciences during the 1975-76 fiscal year. New research funded during this period totaled \$637,036, which is a 67 percent increase over the preceding year.

Much of the research described herein resulted in the publication of scientific papers and/or reports, and these are listed in the final section of this document. When these publications are considered in conjunction with the numerous presentations made at various professional meetings, symposia, etc., it is clear that the faculty have again represented Florida Technological University in an outstanding manner.

Also, as has been true every year since the University began, faculty involvement in community affairs and public service ventures has been extensive, and the faculty are to be commended for their participation in this important effort.

Bernard Ostle

Dean

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES

TITLE: A continuation of base-line studies for environmentally monitoring space transportation systems (STS) at John F. Kennedy Space Center.

PRINCIPAL INVESTIGATOR: David H. Vickers

SPONSORING AGENCY: National Aeronautics and Space Administration

GRANT NO.: 101220006

A B S T R A C T

The purpose of this contract is to continue a base-line inventory of Merritt Island which may be used to evaluate any future changes which may occur as a result of various activities carried out by NASA on the island.

* * * * *

TITLE: Study of methane production for solid waste leachate.

PRINCIPAL INVESTIGATOR: Julius F. Charba

SPONSORING AGENCY: Institutional Grants for Science

GRANT NO.: 182000011, Methane Production

* * * * *

TITLE: Non-point Source Effects

PRINCIPAL INVESTIGATOR: Julius F. Charba

SPONSORING AGENCY: State Department of Environmental Regulation

GRANT NO.: -

A B S T R A C T

Research and preparation of report #ESE1-76-1 (sponsored research in the College of Engineering) completed Fall 1975.

* * * * *

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: A Study of a Diverse Coastal Ecosystem
on the Atlantic Coast of Florida

PRINCIPAL INVESTIGATOR: Llewellyn M. Ehrhart

SPONSORING AGENCY: NASA/KSC

GRANT NO.: 101220004

* * * * *

TITLE: Virus in Well Samples

PRINCIPAL INVESTIGATOR: Robert N. Gennaro

SPONSORING AGENCY: Florida Department of Environmental Regulation

GRANT NO.: 111220005

A B S T R A C T

The presence of viruses in sewage injection well water will be examined to determine the potential health hazard for humans should the well water be used for human consumption.

* * * * *

TITLE: Instructional Scientific Equipment

PRINCIPAL INVESTIGATOR: Robert N. Gennaro

SPONSORING AGENCY: National Science Foundation

GRANT NO.: 11018

* * * * *

TITLE: Biochemical Associations and Gene Regulation
of the Tumorous-head Phenotype

PRINCIPAL INVESTIGATOR: David T. Kuhn

SPONSORING AGENCY: American Cancer Society, Florida Division

GRANT NO.: 181220014

* * * * *

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: Biochemical Associations and Gene Regulation
of the Tumorous-head Phenotype

PRINCIPAL INVESTIGATOR: David T. Kuhn

SPONSORING AGENCY: American Cancer Society, Florida Division

GRANT NO.: F76FT-1(A) ACS#, not FTU

* * * * *

TITLE: Florida Academy of Sciences

PRINCIPAL INVESTIGATOR: Harvey A. Miller

SPONSORING AGENCY: Florida Academy of Sciences, Inc.

GRANT NO.: 181220011

A B S T R A C T

Editorial activities for publication of the Florida Scientist, the quarterly scientific journal of the Florida Academy of Sciences, and certain other functions appropriate to the offices of Editor and of the Executive Secretary are accomplished on a regular basis.

* * * * *

TITLE: Protonematal Differentiation in Mosses

PRINCIPAL INVESTIGATOR: Harvey A. Miller

SPONSORING AGENCY: Office of Sponsored Research

GRANT NO.: 18200019

A B S T R A C T

Axenic cultures of sporlings grown from spores isolated from nature show that mosses so far tested have consistent protonematal developmental patterns which seem to have systematic and phylogenetic importance. Photomicrographic records of development of individual spores allow future comparisons as the work continues.

* * * * *

BIOLOGICAL SCIENCES (continued)

TITLE: Management of emergent and submergent aquatic vegetation in storm runoff retention ponds using the grass carp.

PRINCIPAL INVESTIGATOR: John A. Osborne

SPONSORING AGENCY: Florida Department of Natural Resources

GRANT NO.: 011220003

A B S T R A C T

Nutrient removal by nine species of emergent, submergent, and floating leaved aquatic plants in three 0.33 acre ponds on the campus of Florida Technological University has been studied for an annual period. Filamentous bluegreen algae numbers were found to be at higher levels in a control pond (containing no vascular aquatic plants) than in the three ponds containing plants. The White Amur was introduced into two of the three ponds containing plants in November 1975. By March 1976 the submersed species (Eelgrass and Brazilian Elodea) was eliminated in the two ponds. At that point, algae populations increased until dilution by rain water in May 1976.

* * * * *

TITLE: Ground Truth Measurements of Hydrilla verticillata Royle and those factors influencing underwater light penetration to coincide with remote sensing and photographic analysis in Florida lakes.

PRINCIPAL INVESTIGATOR: John A. Osborne

SPONSORING AGENCY: Florida Department of Natural Resources

GRANT NO.: 011220004

A B S T R A C T

A reliable, accurate method for measuring the standing crop of Hydrilla verticillata Royle (a submersed exotic aquatic plant) has been developed for the first time in Florida or elsewhere. This procedure allows for a quantitative measure of the fresh weight, dry weight, and ash-free dry weight of the plant on an areal or volumetric basis. The equipment designed and constructed during this phase of the project will be used to gather samples of Hydrilla in Lake Martha to correlate with photographic analysis of aerial photographs taken by NASA during the next two years. The relationship between the ground truth data and the aerial photographic data will be used to build a model to allow for aerial photographic techniques to be used solely to determine total lake biomass estimates of Hydrilla.

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: Limnological Monitoring of Spring Lake, Florida
PRINCIPAL INVESTIGATOR: John A. Osborne
SPONSORING AGENCY: Dr. Phillips Foundation
GRANT NO.: 181220008

A B S T R A C T

Spring Lake, Florida, was monitored for a third year to determine the water quality changes in relation to stormwater retention pond drainage. Benthic invertebrates were found not to change greatly as compared to the first two years of the study, with 60 species encountered. Hexagenia mundo orlando and Chaoborus sp. were found in the greatest abundance. Comparisons between various water quality parameters between years revealed that water quality improved in the lake through time due to decreased runoff (trapped by storm runoff retention ponds).

* * * * *

TITLE: Aquatic Plant Research
PRINCIPAL INVESTIGATOR: John A. Osborne
SPONSORING AGENCY: NASA/Kennedy Space Center
GRANT NO.: 101220005

A B S T R A C T

The scope of this project is to direct an ongoing research project conducted by NASA to evaluate the response of growth in Water Hyacinth to temperature. Review, evaluation, directions, and instructions have been presented to NASA in view of this project.

* * * * *

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: Non-point Source Effects
PRINCIPAL INVESTIGATOR: John A. Osborne
SPONSORING AGENCY: Florida Department of Pollution Control
(now called Florida Department of
Environmental Regulation)
GRANT NO.: 111621001

A B S T R A C T

The objective of this study was to determine changes in pollution loading in runoff waters following rainfall in non-point areas of Central Florida. Numerous parameters were analyzed by the IBM #360 computer (Model 75) with statistical programs to determine the relationships before and after loading. Mass loading was determined to be more accurate than concentration levels in determining the pollution effects before and after heavy runoff after rains.

* * * * *

TITLE: A Study of a Diverse Coastal Ecosystem
on the Atlantic Coast of Florida.
PRINCIPAL INVESTIGATOR: Franklin F. Snelson, Jr.
SPONSORING AGENCY: NASA/KSC
GRANT NO.: NGR 10-019-004

* * * * *

TITLE: Base Line Studies for environmentally monitoring
for effects of Space Transportation Systems at
Kennedy Space Center.
PRINCIPAL INVESTIGATORS: Franklin F. Snelson, Jr., I.J. Stout, L.M. Ehrhart,
H.C. Sweet
SPONSORING AGENCY: NASA/KSC
GRANT NO.: NAS 10-1896

* * * * *

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: Ecological effects and environmental fate
of solid rocket exhaust.

PRINCIPAL INVESTIGATOR: I. Jack Stout

SPONSORING AGENCY: NASA

GRANT NO.: NGR 10-019-009

A B S T R A C T

Field and laboratory phases of this research were concluded in 1975. A final progress report was submitted. LD₅₀ for a native mouse exposed to SRM exhaust has been determined to be 50 ppm/g body weight. The effect of SRM exhaust on hatchability, water relations, and blood gases of chicken and bob-white quail embryos was documented. Field exposure of intact ecosystems failed to demonstrate a response to various concentrations of SRM exhaust.

* * * * *

TITLE: A Study of a Diverse Coastal Ecosystem on
the Atlantic Coast of Florida.

PRINCIPAL INVESTIGATOR: Haven C. Sweet

SPONSORING AGENCY: NASA

GRANT NO.: NGR 10-019-004

* * * * *

TITLE: Completion of the computerized herbarium
of Merritt Island plants.

PRINCIPAL INVESTIGATOR: Haven C. Sweet

SPONSORING AGENCY: Graduate Studies & Research

GRANT NO.: 182000026

* * * * *

TITLE: Development of a technique for plant species
identification using spectral reflection.

PRINCIPAL INVESTIGATOR: Haven C. Sweet

SPONSORING AGENCY: NASA

GRANT NO.: 101220006

* * * * *

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: Postdoctoral Fellowship from the NASA/ASEE
Research Institute at Stanford & Ames.

PRINCIPAL INVESTIGATOR: Haven C. Sweet

SPONSORING AGENCY: NASA

* * * * *

TITLE: Ecological effects and environmental fate
of solid rocket exhaust.

PRINCIPAL INVESTIGATOR: David W. Washington

SPONSORING AGENCY: NASA

GRANT NO.: NGR 10-019-009

A B S T R A C T

This study was designed to establish base-line information on the respiratory apparatuses of two species of mice indigenous to the Cape Canaveral-Kennedy Space Center area. These data can serve as controls for future investigations concerning the pathological effects of their repeated exposure to emission products produced by the solid rocket motors (SRM) during the implementation of the space shuttle program.

* * * * *

TITLE: Bryophyta of Merritt Island

PRINCIPAL INVESTIGATOR: Henry O. Whittier

SPONSORING AGENCY: NASA/KSC

GRANT NO.: NGR 10-019-009

A B S T R A C T

The bryoflora of the NASA/KSC facilities on Merritt Island was surveyed principally during the Spring and Summer seasons, with the addition of 27 moss taxa (previous records reported only 20), 19 hepatic taxa (previously 0), and one anthocerote taxon (previously 0). The systematic data and ecological records form the basis for bryophyte-vascular plant community analysis, and for comparative considerations of communities potentially affected by exhausts from rocket fuel motors with communities not potentially so affected. No evidence was found to indicate exhaust pollutants influenced or modified the bryophyte components of the higher plant communities in any way.

FUNDED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: Isolation of Bacteria
PRINCIPAL INVESTIGATOR: Rudy J. Wodzinski
SPONSORING AGENCY: Graduate Studies & Research
GRANT NO.: 182000030

A B S T R A C T

Attempts have been made to isolate microorganisms which can utilize cellulose as a carbon source at 80C under anaerobic conditions. Enrichments at these selective conditions have resulted in some cellulose decomposition. The organisms have not been isolated in pure culture nor have the end products of metabolism been determined. This project is aimed at converting waste products to useful compounds.

* * * * *

TITLE: Viruses in Well Water
PRINCIPAL INVESTIGATOR: Rudy J. Wodzinski
SPONSORING AGENCY: Florida Department of Environmental Regulation
GRANT NO.: 111220005

A B S T R A C T

The presence of viruses in sewage injection well water will be examined to determine the potential health hazard for humans should the well water be used for human consumption.

* * * * *

TITLE: Mutation of Candida lipolyticum to Produce High Yields of Lipase.
PRINCIPAL INVESTIGATOR: Rudy J. Wodzinski
SPONSORING AGENCY: Bio International, Inc.

A B S T R A C T

The objective is to mutate C. lipolyticum to produce high yields of extracellular lipase.

* * * * *

CHEMISTRY

TITLE: Mossbauer Spectroscopic Studies of Homogeneous Catalysts Coordinately Bound to Polymer Supports.

PRINCIPAL INVESTIGATOR: Chris A. Clausen III

SPONSORING AGENCY: Research Corporation

GRANT NO.: 18-1221-006

A B S T R A C T

This grant supports a project which is designed to increase our understanding of the catalytic action of supported homogeneous catalyst systems.

* * * * *

TITLE: Selected Iron and Ruthenium Mossbauer Studies - A Study of Supported Ruthenium Catalysts.

PRINCIPAL INVESTIGATOR: Chris A. Clausen III

SPONSORING AGENCY: National Science Foundation

GRANT NO.: An extension of Supplement GP-38054X

A B S T R A C T

This grant supports a project which deals with the study of surface structure and support interactions within ruthenium catalyst systems.

* * * * *

TITLE: Cooperative Research in Graduate Education

PRINCIPAL INVESTIGATOR: Chris A. Clausen III

SPONSORING AGENCY: Dow Chemical Company

A B S T R A C T

This grant supports the research activities of two graduate students working in the area of 2-chloroacrylic acid production and the development of catalyst systems for the production of fluorocarbons.

* * * * *

CHEMISTRY (continued)

TITLE: Biochemical, Immunological and Genetic Association
of the Tumorous-head Phenotype in Drosophila
Melanogaster.

PRINCIPAL INVESTIGATOR: G. N. Cunningham

SPONSORING AGENCY: American Cancer Society, Florida Division

GRANT NO.: F76-FT-1

A B S T R A C T

Objectives of the present proposal are: (1) To understand developmental relationships and genetic regulation of aldehyde oxidase, related enzymes, and control enzymes at various developmental stages to the tumor-head phenotype by studying gene interaction by gene substitution, gross enzyme activity, tissue specific activity, and developmental fate of the abnormal eye-antennal discs; (2) To immunologically characterize the two unique antigenic tumorous-head bands, genetically localize them, and explore the possibility that other immunological properties may be unique to the tumorous-head flies and their head growths.

* * * * *

TITLE: The Use of Insoluble Polymeric Supports in Reaction
Chemistry (Undergraduate Research Participation)

PRINCIPAL INVESTIGATOR: John P. Idoux

SPONSORING AGENCY: National Science Foundation

GRANT NO.: EPP-750-4419

A B S T R A C T

The primary thrust of this grant is energy-related research directed toward the development and investigation of some new polymeric support systems for use in reaction chemistry. This has involved (a) immobilization and assay of pyruvate decarboxylase on various polymeric supports, (b) synthesis and evaluation of a polymeric sulfide reducing agent and (c) synthesis of some selected precursor diamines for use in polymer synthesis.

* * * * *

FUNDED RESEARCH 1975-76

CHEMISTRY (continued)

TITLE: Undergraduate Research Participation
PRINCIPAL INVESTIGATOR: John P. Idoux
SPONSORING AGENCY: FTU Office of Sponsored Research and FTU Foundation
(Faculty Development Award)
GRANT NO.: Supplement from FTU to NSF Grant EPP-750-4419
(see abstract)

* * * * *

TITLE: Variation-perturbation treatment of chemical
scattering problems.
PRINCIPAL INVESTIGATOR: Stephen K. Knudson
SPONSORING AGENCY: American Chemical Society
GRANT NO.: Petroleum Research Fund, Grant #2848-G2

* * * * *

TITLE: Ecological Effects and Environmental Fate
of Solid Rocket Exhaust.
PRINCIPAL INVESTIGATOR: Brooks C. Madsen (Interdisciplinary with Biology)
SPONSORING AGENCY: NASA/KSC
GRANT NO.:10 101-626-002

A B S T R A C T

Concentrations of several heavy metals in soils collected from
26 different plant communities on Merritt Island were determined.

* * * * *

TITLE: An Evaluation of the Application of High Pressure
Liquid Chromatography to Waste Water Analysis.
PRINCIPAL INVESTIGATOR: Brooks C. Madsen
SPONSORING AGENCY: FTU Division of Sponsored Research

* * * * *

FUNDED RESEARCH 1975-76

CHEMISTRY (continued)

FORENSIC SCIENCE

TITLE: Forensic Science Education: A Support Service
to the Crime Laboratories in Florida, II

PRINCIPAL INVESTIGATOR: W. W. McGee

SPONSORING AGENCY: Bureau of Criminal Justice Planning and Assistance

GRANT NO.: 75-AS-33-A104

A B S T R A C T

This grant provides for completion of the development of the Forensic Science program and a one-year visiting research position for a professional forensic scientist.

FUNDED RESEARCH 1975-76

PHYSICS

TITLE: Computer Generated Films in Physics
PRINCIPAL INVESTIGATOR: Jay S. Bolemon
SPONSORING AGENCY: National Science Foundation
GRANT NO.: FTU Initiation Grant

A B S T R A C T

Programs have been developed to display on the Tektronix graphics display terminal solutions to various physics problems. Films were taken of sequences under altered conditions to study development in time.

* * * * *

TITLE: Analysis of Radio Observations of Cometary
Nebulae which are or may be Thermal Sources
observable at Short Wavelengths
PRINCIPAL INVESTIGATOR: Joel C. Katzin
SPONSORING AGENCY: National Aeronautics and Space Administration
GRANT NO.: NSG 5110

A B S T R A C T

Cometary nebulae which are prospective candidates for being infrared thermal emitters observable at millimeter and centimeter wavelengths are to be observed at Kitt Peak and Greenbank. Data will be analyzed. Variability in time will be studied and interferometer mapping will be done.

* * * * *

TITLE: Radio-astronomy
PRINCIPAL INVESTIGATOR: Joel C. Katzin
SPONSORING AGENCY: National Science Foundation
GRANT NO.: FTU Initiation Grant

A B S T R A C T

Data collected from various radio astronomy observational centers is reduced at FTU.

NONSPONSORED RESEARCH 1975-76

BIOLOGICAL SCIENCES

TITLE: Coordination of NASA/KSC Grant

PRINCIPAL INVESTIGATOR: D. H. Vickers

A B S T R A C T

During Winter Quarter 1976, final reports covering the previous three years work were filed with NASA for Drs. Snelson, Ehrhart, and Sweet. A new three-year contract for approximately \$980,000 was prepared and submitted to NASA, thanks to Dr. Stout's assistance. A presentation of this proposal was made to various KSC and AIBS groups and based upon their comments the proposal was rewritten and funding will go into effect on May 28, 1976.

* * * * *

TITLE: Coordination of Proposed NASA/KSC Contract

PRINCIPAL INVESTIGATOR: D. H. Vickers

A B S T R A C T

Various administrative planning procedures were carried out prior to the actual funding of the above project. Preliminary paper work for the purchasing of supplies, equipment and hiring of personnel was completed.

* * * * *

TITLE: Study of the ecology of chromogacterium violaceum in Central Florida soil and water.

PRINCIPAL INVESTIGATOR: Julius F. Charba

* * * * *

TITLE: Viruses in Sewage Oxidation Ponds

PRINCIPAL INVESTIGATOR: Robert N. Gennaro

* * * * *

TITLE: Drosophila development

PRINCIPAL INVESTIGATOR: David T. Kuhn

A B S T R A C T

The overall objective of the research project is to demonstrate biochemical abnormalities associated with various homeotic mutants in

BIOLOGICAL SCIENCES (continued)

Drosophila melanogaster. We have demonstrated abnormal aldehyde oxidase patterns in: (1) Eye-antennal imaginal discs of tumorous-head 3rd instar larvae; (2) Wing discs of engrailed 3rd instar larvae; (3) Halter discs of bithorax and postbithorax 3rd instar larvae. Our most important contribution to developmental biology is the existence of developmental compartments in mature wing discs that can be histochemically located by staining for aldehyde oxidase. These developmental compartments have previously been observable only during the adult stage.

* * * * *

TITLE: Prodrumus Florae Muscorum Polynesiae

PRINCIPAL INVESTIGATOR: Harvey A. Miller

A B S T R A C T

This catalog of all reports of mosses from tropical Polynesia, Pacific islands, accounts for nomenclatural synonyms, taxonomic synonyms, misidentifications, and geographic distributions of nearly 1000 species as obtained from the approximately 800 references cited. The manuscript is now in final stages of preparation in accordance with requirements of the publisher, J. Cramer Verlag, Lehre, who has accepted this book for publication.

* * * * *

TITLE: Florida Mosses

PRINCIPAL INVESTIGATOR: Harvey A. Miller

A B S T R A C T

Since publication of Breen's Mosses of Florida in 1963, few supplementary reports have appeared and none have dealt with the imperfectly known flora of peninsular Florida where 31 counties of 46 have fewer than 20 species of mosses known, as opposed to a reasonable expectation of more than 125 species. My new identification key, now being tested, simplifies recognition of genera. County-by-county field work continues as an irregular activity whenever personal resources are sufficiently available. A numbered series of articles will begin to appear in 1976.

* * * * *

NONSPONSORED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: Mosses and liverworts of Tropical
Pacific Islands

PRINCIPAL INVESTIGATOR: Harvey A. Miller

A B S T R A C T

Despite inaccessibility of thousands of specimens held in dead storage in my laboratory for lack of the needed 25 herbarium cases, the first moss flora for Micronesia is now in draft with over 5,000 specimen citations. Study leading to preparation of similar materials for Hawaiian mosses and liverworts and for Micronesian liverworts continues.

* * * * *

TITLE: NASA/KSC Ecology Grant: Fishes of Merritt Island

PRINCIPAL INVESTIGATOR: Franklin F. Snelson, Jr.

A B S T R A C T

Computer-operated statistical programs were developed to summarize and analyze fish data from the NASA/KSC ecology grant. Graphs and tables were prepared and a 407-page, two-volume final report on ichthyological studies was submitted. Laboratory studies of reproduction in the sailfin molly, Poecilia latipinna, were continued, with special attention devoted to sex ratio and sperm storage.

* * * * *

TITLE: Ecology of sandpine-scrub oak communities

PRINCIPAL INVESTIGATOR: I. Jack Stout

A B S T R A C T

The major objective of this research has been to determine the nature of resource division among co-existing small mammals found in the sandpine-scrub oak community. Small mammal populations and selected seed resources have been monitored over 40 months on three study areas. A food supplement experiment has been completed. Current effort is directed toward preparation of manuscripts which report on the studies.

* * * * *

BIOLOGICAL SCIENCES (continued)

TITLE: Heart Disease and Its Relationship to
Immune Complexes of Milk Proteins.

PRINCIPAL INVESTIGATOR: Michael J. Sweeney

A B S T R A C T

The project objective is to determine if antigens of whole milk are involved in an immune complex disease leading to or aggravating arteriosclerosis.

* * * * *

TITLE: Production of Antibody of Diethylstilbestrol

PRINCIPAL INVESTIGATOR: Michael J. Sweeney

A B S T R A C T

The project objective is to prepare antibody to DES, so that a sensitive assay (radio immune assay) can determine its presence in tissue.

* * * * *

TITLE: Antigens of Histoplasma Capsulatum Cell Walls

PRINCIPAL INVESTIGATOR: Michael J. Sweeney

A B S T R A C T

The project objective is to isolate and identify antigens from the cell walls of H. Capsulatum, which may be useful in the diagnosis of histoplasmosis.

* * * * *

TITLE: Thymus Derived and Bursa Derived Lymphocytes
in the Peripheral Blood of Normal and
Diseased Groups.

PRINCIPAL INVESTIGATOR: Michael J. Sweeney

A B S T R A C T

The project objective is to contrast normal populations with individuals who are presently afflicted with various clinical diseases, with regard to the T and B cell populations in peripheral blood.

* * * * *

NONSPONSORED RESEARCH 1975-76

BIOLOGICAL SCIENCES (continued)

TITLE: NASA/KSC Ecology Grant
PRINCIPAL INVESTIGATOR: Haven C. Sweet
GRANT NO.: 515108 (final report submitted 1975)

A B S T R A C T

To finish the organization and verification of the Merritt Island herbarium. To complete the addition of data to the computer.

* * * * *

TITLE: Ornithological Investigations in Central Florida
PRINCIPAL INVESTIGATOR: Walter K. Taylor

A B S T R A C T

To obtain as much information as possible on various aspects of avian biology.

* * * * *

TITLE: Differential Responses of Rabbits
to Injections of Homogenates from Wild-type and
a Mutant Strain of Drosophila Melanogaster.
PRINCIPAL INVESTIGATOR: David W. Washington

A B S T R A C T

The short-term objectives are to assay the blood from rabbits injected with homogenates from tumorous-head and wild-type Drosophila and with physiological saline. The results could reveal possible mechanisms utilized by the antigens of the tumorous-head flies in the reduction of clotting time.

* * * * *

TITLE: Enzymatic Studies on B₆ Effects on
Synthesis of Apotryptophanase Enzyme
PRINCIPAL INVESTIGATOR: Roseann S. White

A B S T R A C T

Project objective is to understand whether a coenzyme (B₆) influences the synthesis of its apo-enzyme in bacteria which synthesize their own B₆. A final report was submitted to Sigma Xi which originally funded the work showing that there is a marked decrease in apotryptophanase activity in vitamin B₆ mutants starved for B₆. This research is being

BIOLOGICAL SCIENCES (continued)

continued and mutant strains maintained on an unfunded basis (Fall 1975).

* * * * *

TITLE: Methanogenesis from Solid Waste

PRINCIPAL INVESTIGATOR: Roseann S. White

A B S T R A C T

Project objective is to study some of the parameters influencing the rate of methanogenesis from solid waste. A literature search has been completed and a new chamber was constructed with specification modifications of a system described in literature necessary to support the strictly anaerobic methane producers. This chamber will be placed inside the present chamber to lower the O/R potential in present chamber which was found not to be low enough to support their growth. Methodology for gas chromatographic analysis of CH₄, CO₂, H₂ has been determined.

* * * * *

TITLE: Biological Studies on Pacific Islands,
Latin American, and Florida Musci.

PRINCIPAL INVESTIGATOR: Henry O. Whittier

PROJECT NOS.: Fall: 515111, Winter: 525113, Spring: 535132

A B S T R A C T

Project objectives follow three basic lines: (1) the Pacific Islands, (2) Central and Northern South America, and (3) Florida bryophyte studies, primarily emphasizing Musci. The book Mosses of the Society Islands is now on the market, and the paper, A Preliminary List of Fijian Mosses, summarizing previous work in the Fiji Islands and revising the nomenclature of Fijian mosses, is published. The Prodromus Florae Muscorum Polynesiae, co-authored with H. A. Miller and B. A. Whittier, is being prepared in camera-ready copy for publication as a book of approximately 250-300 pages. In the second line, collections made in Guatemala and in the Canaima Park District of Venezuela are presently being cataloged, and in the third category of study, an enlarged version of the Merritt Island/KSC study has been submitted for publication in the Florida Scientist; further research on the systematics and ecology of Florida bryophytes is being conducted.

CHEMISTRY

TITLE: A Study of the Feasibility of Using Mossbauer Spectroscopy to Investigate Ruthenium Catalyst Systems.

PRINCIPAL INVESTIGATOR: Chris A. Clausen

A B S T R A C T

A project to develop methods for studying ruthenium catalysts by Mossbauer spectroscopy.

* * * * *

TITLE: Purification and Characterization of Aldehyde Oxidase from Wild Type and Tumorous-head Strains of Drosophila Melanogaster.

PRINCIPAL INVESTIGATOR: Glenn N. Cunningham

A B S T R A C T

The purpose of this project is to obtain in pure form aldehyde oxidase from wild type and tumorous-head strains of Drosophila melanogaster. The enzyme from both sources will be thoroughly characterized and a comparison of the characteristics will be made between strains. In addition, the mechanism of catalysis by this enzyme and the function of its cofactors will be investigated.

* * * * *

TITLE: Mass Spectrometry

PRINCIPAL INVESTIGATOR: G. R. Hertel

A B S T R A C T

Attempts to produce detectable amounts of ions by exposing gas mixtures to UV radiation failed in all but one case. Some background impurity produced measurable amounts of mass 44 (most probably CO₂). The source of this could not be determined. Detector sensitivity was increased several orders of magnitude by installation of an ion counting system of detection. This may make it possible to detect products of UV induced reactions between various gases of interest.

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CHEMISTRY (continued)

TITLE: Determination of the Transmission Coefficient
of the Amide Bond.

PRINCIPAL INVESTIGATOR: John P. Idoux

A B S T R A C T

To determine the transmission coefficient of the amide bond via pK measurements on oxanilic acids.

* * * * *

TITLE: The π -Electron-Steric Effect

PRINCIPAL INVESTIGATOR: John P. Idoux

A B S T R A C T

To more clearly understand the origin and nature of the π -electron-steric effect in the biphenyl system and investigate its generality in other organic materials.

* * * * *

TITLE: Proximity Substituent Effects in Organic Chemistry

PRINCIPAL INVESTIGATOR: John P. Idoux

A B S T R A C T

To define and investigate the phenomenon of the 7-number effect in organic chemistry.

* * * * *

TITLE: The Application of Linear and Multiple Regression
Correlation Analysis to Structure-Property Studies
in Organic Chemistry.

PRINCIPAL INVESTIGATOR: John P. Idoux

A B S T R A C T

Linear and multiple regression correlation analysis are being applied to various structure-property studies in order to develop a quantitative parameter for representing steric effects in organic molecules.

* * * * *

CHEMISTRY (continued)

TITLE: Preparation and Process Development of
Benzylamine Derivatives.

PRINCIPAL INVESTIGATOR: R. W. Ingwalson

A B S T R A C T

Make a process study of benzylamine derivatives, gather data for an economic analysis of each derivative and develop suitable samples for application evaluations.

* * * * *

TITLE: Preparation and Process Study of Benzylamine
Derivatives.

PRINCIPAL INVESTIGATOR: R. W. Ingwalson

A B S T R A C T

A study was made of mono-, di- and tribenzylamines and an economic evaluation was made on two different routes to each.

* * * * *

TITLE: Evaluation of a By-product Stream as a Useful
Raw Material.

PRINCIPAL INVESTIGATOR: R. W. Ingwalson

A B S T R A C T

A by-product stream consisting mainly of methylbenzoate was evaluated as a raw material source for the benzoate moiety.

* * * * *

TITLE: Calculation of Molecular Orbitals for Amide
Derivatives.

PRINCIPAL INVESTIGATOR: Stephen K. Knudson

A B S T R A C T

CNDOIZ calculations of molecular orbitals and energies provide information on electron densities throughout a molecular structure. These can be used in conjunction with certain types of experimental data, such as PMR shifts and pKa values to assist in determining molecular structure and properties.

* * * * *

CHEMISTRY (continued)

TITLE: An Evaluation of Various Quaternary Ammonium Salts in PVC Matrices as Ion Selective Electrodes

PRINCIPAL INVESTIGATOR: Brooks C. Madson

A B S T R A C T

Several salts were evaluated. Those determined to be of greatest value are Crystal Violet and hexadecylpyridinium Bromide.

* * * * *

GEOLOGY

TITLE: Geophysical Studies: Preparation.

PRINCIPAL INVESTIGATOR: Frank B. Kujawa

A B S T R A C T

To consult with experienced workers on geophysical techniques and problems in Central Florida; and to field test, evaluate, and purchase a suitable exploration seismograph.

MATHEMATICAL SCIENCES

TITLE: Pre-Calculus Modules for QUICK CAI System

PRINCIPAL INVESTIGATOR: J. M. Anthony

A B S T R A C T

A number of Pre-Calculus Modules for the QUICK CAI System are in various stages of preparation for implementation in the Fall Quarter 1976.

* * * * *

TITLE: Courseware and Implementation Procedures
for Computer Managed Instruction in
Precalculus Mathematics.

PRINCIPAL INVESTIGATORS: J. M. Anthony and H. C. Gerber

A B S T R A C T

Drs. Anthony and Gerber have begun the development of courseware and implementation procedures for computer managed instruction (CMI) in precalculus mathematics using the Quasi-Interactive Computer-Based Instructional Systems (QUICK) developed at Purdue under the direction of Dr. Frederick. This system provides the universe for organizing instruction management. In recent weeks Drs. Rautenstrauch and Armstrong have joined the research team.

A controlled experiment will be conducted in two MATH 107 sections during the 1976 Fall Quarter to compare student performance after standard class presentation with student performance following CMI. The mathematics topics involve two weeks of instruction. It is anticipated that the results will provide guidance for possible expansion of the system to all precalculus topics.

* * * * *

TITLE: Fuzzy Groups

PRINCIPAL INVESTIGATORS: J. M. Anthony and H. Sherwood

A B S T R A C T

The purpose of this endeavor is to prepare a paper which modifies the definition of a fuzzy group in the literature. The existing definition is, in the opinion of the investigators, too restrictive. Properties of motivating examples will be investigated.

MATHEMATICAL SCIENCES (continued)

TITLE: Orders

PRINCIPAL INVESTIGATORS: M. Barr and R. Caron

A B S T R A C T

Let R be a commutative ring with identity and let $R_2 = R \times R$. If R is a field, then R_2 viewed as a vector space over R has trivially only one two-dimensional subspace, namely R_2 . However, if the condition that R be a field is relaxed and R is taken to be a Principal Ideal Domain, then R_2 may be viewed as two-dimensional R algebra. In this case two-dimensional R submodules (algebras) of R_2 abound. A comprehensive study of these two-dimensional substructures is under way and some interesting theorems have resulted.

* * * * *

TITLE: Research in Combinatorial Theory

PRINCIPAL INVESTIGATOR: R. C. Brigham

A B S T R A C T

Going through Hall's book on the subject in detail. Investigation of various algorithmic approaches in order to define master level projects.

* * * * *

TITLE: Participation in a Problem Seminar

PRINCIPAL INVESTIGATOR: R. C. Brigham

A B S T R A C T

The seminar attempted to solve problems posed in mathematical magazines.

* * * * *

TITLE: Investigations Using Varian 73 Minicomputer

PRINCIPAL INVESTIGATOR: R. C. Brigham

A B S T R A C T

Learning more about the computer to aid in the teaching of COMP 305 and 306.

MATHEMATICAL SCIENCES (continued)

TITLE: The Remez Algorithm Generalized to
Apply to a Class of Min-Max Problems

PRINCIPAL INVESTIGATOR: Roy C. Jones, Jr.

A B S T R A C T

A Remez type algorithm is developed to find the point $\bar{V}^* \in E^n$ such that $F(\bar{V}^*) = \min_{\bar{V} \in E^n} F(\bar{V})$ where F is from a certain class of real valued functions defined in E^n . The function F is defined as $F = \max_{i \in I} f_i$ where the f_i 's are real valued functions defined on E^n and satisfying further convexity requirements while I is a finite indexing set. Two example F 's are used to illustrate the algorithm.

* * * * *

TITLE: An Environment for Research
in Virtual Computer Systems.

PRINCIPAL INVESTIGATOR: Allan L. Lang

A B S T R A C T

Project Delta is designed to give senior undergraduate and graduate students meaningful research projects dealing with virtual computer systems. At present there are ten graduate students and six undergraduates participating in Delta. A 1-1/2 hour meeting is held weekly where activities within the project are discussed. Project Delta has a project notebook where all activities are kept on a scoreboard so that progress in each activity can be measured. Each activity that is currently being supported by Delta is referenced in the RIAS proposal that the Department of Mathematical Sciences submitted in March 1976.

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TITLE: Cluster Analysis

PRINCIPAL INVESTIGATOR: Edward Norman

A B S T R A C T

Research in Cluster Analysis with special attention to applications in the biological sciences, e.g., classical taxonomy, numerical taxonomy, phylogenetic systematics, cladistics, and graph theory.

MATHEMATICAL SCIENCES (continued)

TITLE: Classification of Polynomials

PRINCIPAL INVESTIGATOR: C. P. Rautenstrauch

A B S T R A C T

The purpose of this project is to study the Sheffer Classification and an extension and determine if possibilities exist for further extending of this type of work.

* * * * *

TITLE: Conjugate Transforms on Certain Semi-groups
of Distribution Functions and PM Spaces

PRINCIPAL INVESTIGATOR: Howard Sherwood

A B S T R A C T

The objective is to enlarge understanding of recent developments concerning conjugate transforms on certain semi-groups of distribution functions paying close attention to applicability in probabilistic metric spaces (PM spaces).

PHYSICS

TITLE: Optical Interactions with Matter

PRINCIPAL INVESTIGATOR: Harry E. Bates

A B S T R A C T

Infrared spectral reflectivity measurements on materials under evaluation at the Solar Energy Center are planned. Setting up and calibration of equipment for this purpose at FTU is in progress.

* * * * *

TITLE: Ultra-Short Optical Pulse Studies and
Quantum Electronics

PRINCIPAL INVESTIGATOR: Harry E. Bates

A B S T R A C T

An optimum time profile is needed for laser heating of solid fuel pellets in laser induced fusion. A new approach is being attempted at FTU for shaping ultra-short YAG laser pulses.

* * * * *

TITLE: Calculations on Models of Diatomic Molecules

PRINCIPAL INVESTIGATOR: Jay S. Bolemon

A B S T R A C T

The computer is used to find solutions to the Hartree equation for two particles in 1 dimension experiencing two stationary potential wells. This situation is equivalent to a pseudo-diatomic hydrogen molecule.

* * * * *

TITLE: Calculation of Sky View from Globular Clusters

PRINCIPAL INVESTIGATOR: Jay S. Bolemon

A B S T R A C T

Computer generated pictures are used to compare a window of the earth's sky in the vicinity of Orion to an equivalent window on a planet with no atmosphere at the center of M3.

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PHYSICS (continued)

TITLE: Computer Generated Films in Physics

PRINCIPAL INVESTIGATOR: Jay S. Bolemon

A B S T R A C T

Three point masses interacting through their mutual gravitational attraction are filmed in real-time motion providing a study of their orbits. This provides insight into processes in galactic star clusters.

* * * * *

TITLE: Triangulation on Point Source of Gamma Radiation

PRINCIPAL INVESTIGATOR: J. J. Brennan

A B S T R A C T

A shielded sodium iodide detector and multichannel analyzer were used in a simulation study aimed at source location. Depth dependence of radiation from underground gamma ray sources used in certain industrial applications was studied in a controlled laboratory environment.

* * * * *

TITLE: Laser Pulse Tailoring

PRINCIPAL INVESTIGATOR: B. J. Henderson

A B S T R A C T

Pulse shaping is accomplished by combining outputs from various stages of birefringent crystals which divide the input beam into two orthogonally propagating modes.

* * * * *

TITLE: Radio Astronomy of H II regions

PRINCIPAL INVESTIGATOR: Joel C. Katzin

A B S T R A C T

Reduction of radio astronomy data from several sites has been undertaken. Information gained is used to evaluate theoretical models of interstellar H II regions of spiral galaxies.

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NON-SPONSORED RESEARCH 1975-76

PHYSICS (continued)

TITLE: Tracking Errors in Radio Telescopes

PRINCIPAL INVESTIGATOR: Joel C. Katzin

A B S T R A C T

Radio astronomy measurements of radio sources are limited by background noise. Analysis techniques have been developed to accurately compensate for radio telescope tracking errors, even in the presence of high background noise levels.

* * * * *

TITLE: Observations of Jupiter

PRINCIPAL INVESTIGATOR: Joel C. Katzin

A B S T R A C T

A radio telescope for observation of Jupiter was set up on the roof of the Engineering building. Recording gear was installed and a number of observations made testing calibration procedures.

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PRESENTATIONS OF PROFESSIONAL PAPERS 1975-76

ALLIED HEALTH SCIENCES

BERGNER, J. F., presentation to Health Career Day, Mercy Hospital, Orlando, Florida. November 2, 1975.

TUCKER, JEANNE H., "Legal Aspects of Long Term Care Records," "Utilization Review in Long Term Care," at Workshop in Long Term Care, Mississippi Medical Record Association, Jackson, Mississippi. January 28, 1976.

TUCKER, JEANNE H., "The Role of the Medical Record Administrator in Peer Review," for Peer Review Seminar, Hillsborough County Medical Society, Tampa, Florida. March 27, 1976.

TUCKER, JEANNE H., "Cost Analysis Through Work Measurement in Medical Records, Texas Medical Record Association Annual Meeting, Dallas, Texas. May 17, 1976.

TUCKER, JEANNE H., "AMRA Update," "Cost Analysis through Work Measurement in Medical Records," Mississippi Medical Record Association Annual Meeting, Tupelo, Mississippi. June 4, 1976.

PRESENTATIONS OF PROFESSIONAL PAPERS

BIOLOGICAL SCIENCES

VICKERS, DAVID H., "A Continuation of Base-Line Studies for Environmentally Monitoring Space Transportation Systems (STS) at John F. Kennedy Space Center," NASA/KSC Environmental Effects Panel and American Institute of Biological Sciences Review Committee, Cocoa Beach, Florida. March 4, 1976.

CHARBA, J. F., Y. A. YOUSEF, J. A. OSBORNE and W. M. McLELLON, "Water quality responses due to stormwater in Central Florida," annual meeting of American Society of Civil Engineers, Gainesville, Florida. September 18-20, 1975.

EHRHART, L. M. and R. G. YODER, "Initial results of studies of marine turtles in Mosquito Lagoon, Merritt Island NWR, Brevard County, Florida," annual meeting of Florida Academy of Sciences at Eckerd College, St. Petersburg, Florida. March 19, 1976.

EHRHART, L. M. and M. H. HARRISON, "Nest-building behavior of the rice rat, Orzomys palustris natator, from Merritt Island, Brevard County, Florida," annual meeting of the Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 18-20, 1976.

GENNARO, ROBERT N., G. VANDERMOLEN, T. O. PEEPLES and F. W. BISELINI, "Chemical Nature and Statistical Analysis of the Distribution of Plugging in Blight LYTD-affected Citrus Trees," 88th meeting of the Florida Horticultural Society at Lake Buena Vista, Florida. November 5-6, 1975.

KOEVENIG, J. L., R. L. ARNOLD AND T. O. MORGAN, "Biology of Man - A Nontraditional Approach to College Teaching." Florida Academy of Science annual meeting, Eckerd College, St. Petersburg, Florida. March 18-20, 1976.

KOEVENIG, J. L., "Cave Ecology," a presentation for the Museum Docent Program, Florida State Museum, Gainesville, Florida. 1975.

KUHN, DAVID T., "Aldehyde oxidase distribution in various Drosophila melanogaster imaginal discs." Seminar presented to genetics group at Texas A&M University, College Station, Texas. March 1976.

KUHN, DAVID T., "Aldehyde oxidase compartmentalization in the wing disc of Drosophila melanogaster," Drosophila Research Conference, Tempe, Arizona. March 1976.

MILLER, H. A., "Floristic needs in the Pacific Basin - summary of the symposium," Symposium of the XIIIth Pacific Science Congress, Vancouver, B.C., August 1975.

MILLER, H. A., "Floristic needs in the Pacific Basin - mosses and liverworts" Symposium of the XIIIth Pacific Science Congress, Vancouver, B. C., August 1975.

MILLER, H. A., "Mosses, man and modern environment," Environmental Science Seminar, IUPUI, Indianapolis, Indiana. February 1976.

PRESENTATIONS OF PROFESSIONAL PAPERS

BIOLOGICAL SCIENCES (continued)

MILLER, H. A., "A geobotanical perspective on bryophyte evolution," International Geobotany Conference, Bowling Green, Ohio. February 1976.

MILLER, H. A., "Report of the Editor," annual meeting, Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 18-20, 1976.

OSBORNE, J. A., "Species Diversity and Abundance of Benthic Macroinvertebrates in a Central Florida Lake," 24th annual meeting of the North American Benthological Society, La Crosse, Wisconsin. March 24-26, 1976.

OSBORNE, J. A., D. O. FRY and D. B. PEARCE, "Invasion of zooplankton into four freshwater ponds in Central Florida," annual meeting of the Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 18-20, 1976.

OSBORNE, J. A., J. J. DAIGLE and J. R. STARTZMAN, "Benthic Macroinvertebrates - abundance and species diversity in a Central Florida Lake," annual meeting of the Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 18-20, 1976.

OSBORNE, J. A., "Management of aquatic vegetation with the grass carp and a new Hydrilla sampler," Annual Presentation of Research Projects meeting, Florida Department of Natural Resources, Gainesville, Florida. February 11, 1976.

OSBORNE, J. A., "Zooplankton composition and species diversity in Lake Apopka, Florida," 39th annual meeting of the American Society of Limnology and Oceanography, Inc., Savannah, Georgia. June 21-24, 1976.

OSBORNE, J. A., "Biology of the white amur and its use in Central Florida for control of Hydrilla verticillata Royle." Radio taped presentation by Florida Technological University for presentation on ten Central Florida radio stations, August 31, 1975. 30-minute broadcast.

OSBORNE, J. A., "Experimental research of the grass carp at Florida Technological University." Radio taped presentation by Florida Technological University for presentation on five Central Florida radio stations. 5-minute broadcast.

SNELSON, FRANKLIN F., JR., "Aspects of reproduction in the sailfin molly, Poecilia latipinna, in Florida," annual meeting of the combined Association of Southeastern Biologists and Southeastern Division, American Society of Ichthyologists and Herpetologists in New Orleans, Louisiana. April 1976.

STOUT, I. J., "Resource division among small mammals," seminar at the Department of Animal Ecology, Iowa State University. July 1975.

PRESENTATIONS OF PROFESSIONAL PAPERS

BIOLOGICAL SCIENCES (continued)

STOUT, I. J., "Response of small mammals in a scrub community to supplementary food," annual meeting of Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 18-20, 1976.

STOUT, I. J. with L. E. deGuehery, "Some effects of solid rocket motor exhausts on avian embryos," annual meeting of Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 18-20, 1976.

SWEENEY, MICHAEL J., "Aspects of Tumor Immunology," national meeting of the American Society for Medical Technology, on November 8, 1975, in Orlando, Florida.

SWEENEY, MICHAEL J., "Clinical Immunology," a series of lectures, Winter Park Memorial Hospital, Winter Park, Florida. December 1975-January 1976.

SWEENEY, MICHAEL J., "Production of Antibodies to Diethylstilbestrol," annual meeting, Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 20, 1976.

SWEENEY, MICHAEL J., "An Immunological Study of the Tumorous-Head Antigens found in Drosophila melanogaster," annual meeting of the Florida Academy of Sciences, Eckerd College, St. Petersburg, Florida. March 20, 1976.

SWEENEY, MICHAEL J., "Dinitiochlorobenzene as a Stimulant of the Reticuloendotheliol System," presented at the Upjohn Pharmaceutical Company, King of Prussia, Pennsylvania. May 3, 1976.

WHITTIER, H. O., "Floristic Needs in the Pacific Basin - Mosses," invited paper at XIIIth Pacific Science Congress in Vancouver, B. C. (presented by Dr. H. A. Miller). August 1975.

WODZINSKI, R. J., Symposium Chairman: Physiology of Organisms of Industrial Significance, presented at ASM Conference on Genetics and Molecular Biology of Industrial Microorganisms, Orlando, Florida. February 1976.

WODZINSKI, R. J., Symposium Chairman: Biodegradation of Organic Compounds, presented at ASM meeting in Atlantic City, New Jersey. May 1976.

WODZINSKI, R. J., Session Convenor: Local ASM meeting, Miami, Florida. February 1976.

PRESENTATIONS OF PROFESSIONAL PAPERS

CHEMISTRY

CLAUSEN, CHRIS A. III, "Mossbauer Effect Studies of Supported Ruthenium Zeolite Catalysts," 27th Southeast-31st Southwest combined ACS meeting, Memphis, Tennessee. October 1975.

CLAUSEN, CHRIS A. III, "The Application of Mossbauer Spectroscopy to Studies of Supported Ruthenium Catalyst Systems," 10th Mossbauer Symposium, New York, New York. February 1976.

CLAUSEN, CHRIS A. III, "Characterization of Heterogeneous Ruthenium Catalysts by Mossbauer and ESCA Techniques," 171st National ACS Meeting, Philadelphia, Pennsylvania. April 1976.

CUNNINGHAM, G. N., "Biochemical Relationships of Aldehyde Oxidase to Head Tumors in Drosophila," Central Florida Branch of the American Cancer Society, Orlando, Florida. March 1976.

IDOUX, J. P., "Structure-Property Correlations of Carboxylic Acid Derivatives: Six-Number Effects Revisited," 27th Southeast-31st Southwest combined regional meeting of the American Chemical Society, Memphis, Tennessee. October 1975.

IDOUX, J. P., "Conformational Influence of Nitrogen Attached Groups on Acyl Group Priorities in N-Monosubstituted Acetamides," Meeting-in-Miniature, American Chemical Society, Jacksonville, Florida. May 1976.

KNUDSON, S. K., "Perturbation Technique for Elastic Scattering," VI Southeast Theoretical Chemists Association, Tallahassee, Florida. June 1975.

KNUDSON, S. K., "Model Calculation for Inelastic Scattering," VII Southwest Theoretical Chemists Association, Tuscaloosa, Alabama. May 1976.

McGEE, W. W., "The Use of Kovats Indices in the Crime Laboratory," Southern Association of Forensic Scientists, Boone, North Carolina. September 1975.

McGEE, W. W., "Blood Alcohol Analyses As Done in the State of Florida," American Society of Medical Technologists, Orlando, Florida. November 1975.

McGEE, W. W., "The Need for a B. S. Degree Program in Forensic Science," American Academy of Forensic Scientists, Washington, D. C. February 1976.

McGEE, W. W., "The Need for a B. S. Degree Program in Forensic Science," Southern Association of Forensic Scientists, Tallahassee, Florida. April 1976.

PRESENTATIONS OF PROFESSIONAL PAPERS

MATHEMATICAL SCIENCES

FREDERICK, T. J., "The State of Self-Assessment for the Computing Professional", presented at ACM meeting in Minneapolis, Minnesota, October 1975.

FREDERICK, T. J., "ACM's Involvement in Self Assessment", presented at the National Computer Conference, New York, New York, June 1976.

CARON, R. M., "Orders of Ternary Cubic Forms", presented at MAA meeting in Tallahassee, Florida, March 7, 1976.

LANG, A. L., "The Design of a Polymorphic Arithmetic Unit", presented at IEEE Symposium on Computer Arithmetic, Dallas, Texas, November 1975.

SOMERVILLE, P.N., "On Use of the Mann-Fertig Statistic for Obtaining Confidence Intervals for the Threshold Parameter of the Weibull", presented at Conference on the Theory and Application of Reliability, University of South Florida, Tampa, Florida, December 15-18, 1975.

SOMERVILLE, P. N., "On the Power of the Mann-Fertig Test of the Two-Parameter Versus Three-Parameter Weibull", presented at annual meeting, Florida Chapter, American Statistical Association, University of South Florida, Tampa, Florida. February 20-21, 1976.

PRESENTATIONS OF PROFESSIONAL PAPERS

PHYSICS

NOON, J. H., "Engineering Applications of Optics as seen through the Eyes of a College Student", presented at joint meeting of the Optical Society of America and Sigma Xi, NTEC, Orlando, Florida. April 1976.

BATES, H. E., "A Simple Black Box: Electronic Unknown for Use in the Undergraduate Scientific Instruments Laboratory," South Eastern section of the American Physical Society, Auburn University, Auburn, Alabama. November 1975.

BATES, H. E., "A Simple Black Box: Electronic Unknown for Use in the Undergraduate Scientific Instruments Laboratory," Florida Section, Optical Society of America, Orlando, Florida. January 1976.

BATES, H. E., "A Theoretical Study of Polychromatic Noncollinear Phase Matching Phenomena in Birefringent Crystals," South Eastern Section, American Physical Society, Auburn University, Auburn, Alabama. November 1975.

BATES, H. E., "Picosecond Pulse Shaping Techniques," Florida Section, American Association of Physics Teachers, St. Petersburg, Florida. March 1976.

BATES, H. E., "The Role of the Physicist in Society," Sigma Pi Sigma meeting at Rollins College, Winter Park, Florida. April 1976.

BOLEMON, JAY S., "Teaching Science with Science Fiction," South Eastern Section, American Physical Society, Auburn University, Auburn, Alabama. November 1975.

BOLEMON, JAY S., S. C. BLOCH and P. W. LYONS, "Space Time Evolution of Short Electromagnetic Pulses in Magnetoplasmas," Florida Academy of Sciences annual meeting, St. Petersburg, Florida. March 1976.

BOLEMON, JAY S., "Teaching Science with Science Fiction," Department of Physics, University of Florida, Gainesville, Florida. November 1975.

BOLEMON, JAY S., "Computer Generated Films on Gravity for Elementary Astronomy," Department of Astronomy, University of Florida, Gainesville, Florida. April 1976.

FLINCHBAUGH, DAVID, "Laser Ranging, Tracking and Guidance," Electro Optics International Laser Conference, Anaheim, California. November 1975.

HENDERSON, B. J., "Optical Pulse Shaping," Florida Section, American Association of Physics Teachers, St. Petersburg, Florida. March 1976.

KATZIN, J. C., "Magnetic Monopoles and the Quantization of Electric Charge for a First Year Quantum Mechanics Course," Florida Section, American Association of Physics Teachers, St. Petersburg, Florida. March 1976.

P U B L I C A T I O N S 1 9 7 5 - 7 6

ALLIED HEALTH SCIENCES

JOHNS, P., Script writer for Blood Groups, publication distributed by the Florida Association of Blood Banks.

BIOLOGICAL SCIENCES

- VICKERS, DAVID H., R. S. WHITE and I. J. STOUT. Elemental Analysis of Selected Merritt Island Plants, Florida Scientist 38 (3): 163-171. 1975.
- EHRHART, L. M., Review of "An Introduction to Ecology and Population Biology", by T. C. Emmel. Florida Naturalist 48 (4): 27-28. 1975.
- EHRHART, L. M. and R. G. YODER, "Initial Results of Studies of Marine Turtles in Mosquito Lagoon, Merritt Island NWR, Brevard County, Florida", Florida Scientist 39 (1): 3. 1976.
- EHRHART, L. M., "A Study of a Diverse Coastal Ecosystem on the Atlantic Coast of Florida: Mammal Studies". Final report to the National Aeronautics and Space Administration, Kennedy Space Center, 183 pp. 1976.
- EHRHART, L. M., "A Study of a Diverse Coastal Ecosystem on the Atlantic Coast of Florida: Studies of Marine Turtles at Kennedy Space Center and an Annotated List of Amphibians and Reptiles of Merritt Island", 119 pp. 1976.
- EHRHART, L. M. and M. H. HARRISON, "Nest-building behavior of the rice rat, Oryzomys palustris natator, from Merritt Island, Brevard County, Florida," Florida Scientist 39 (1): 7. 1976.
- GENNARO, ROBERT N., G. VANDERMOLLEN, T. O. PEEPLES and F. W. BISELINI, "Chemical Nature and Statistical Analysis of the Distribution of Plugging in Blight LYTD-affected Citrus Trees." Proc. of the Florida State Horticultural Society, Vol. 88. 1975.
- GENNARO, ROBERT N., "Numbers and Kinds of Viruses in Sewage Oxidation Ponds". Technical Series Vol. 2, #2. Report of Investigations in the Kissimmee River-Lake Okeechobee Watershed. State of Florida Department of Environmental Regulation, pp. 542-558. 1976.
- KOEVENIG, J. L., "Distribution of river birch, Betula nigra, in the United States". Florida Scientist 1: 13-19. 1975.
- KOEVENIG, J. L., "Techniques, exercises and problems in basic biology: an experimental approach." Rev. Ed. Printing and Reproductive Services, Florida Technological University, 127 pp. 1975.
- KUHN, D. T., "Relationship between larval competition, sex ratio, karyotype and the tumorous-head trait in Drosophila melanogaster." Drosophila Information Service 50: 102-104.
- KUHN, D. T. and S.F. DORGAN, "The homeotic effects of tumorous-head phenotype and differential effect of an enhancer gene in Drosophila melanogaster." Can. J. Genet. and Cytol. 17: 423-432.
- KUHN, D. T. and G. N. CUNNINGHAM, "Biochemical relationship of aldehyde oxidase to head tumor development in Drosophila melanogaster". Flacs 28: 37.

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