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## Space Congress Programs

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4-27-1993

# 1993 Thirtieth Space Congress Program

Canaveral Council of Technical Societies

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**THIRTIETH**



**SPACE CONGRESS**

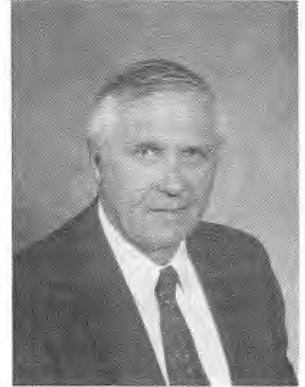
**PROGRAM**

Cocoa Beach, Florida April 27, 28, 29, 30, 1993

## Chairman's Message

The **Thirtieth Space Congress** should be a memorable event. The theme we have chosen "**Yesterday's Vision Is Tomorrow's Reality**" befits this significant anniversary.

Three decades ago the United States had just entered into what we call the "Space Age." Our manned space program was well underway with the very successful Mercury program. The world shared the excitement of these early adventures but were, for the most part, unaware of the technology and human struggle behind the space effort. Here on the Space Coast, a deeper understanding existed. That understanding, combined with a vision, gave birth to the Space Congress. We believe you will find at this event, some of the excitement of those early days as well as opening a window on the future.



The Congress is sponsored by the Canaveral Council of Technical Societies (CCTS) and supported by the National Aeronautics and Space Administration and the Department of Defense. In addition, communities and aerospace companies of the Space Coast have put together an exciting combination of symposiums, displays, social events and educational activities. During this, the oldest such gathering of space expertise of its kind anywhere, you will encounter stimulating presentations, discussions, and displays that focus on the past, present and future of space.

Once again, the Space Congress has attracted an outstanding group of leaders in the military and civilian space programs who will share their assessment of our accomplishments, and vision for the future. This distinguished group of speakers and panel/paper session leaders are noted in the program for your pre-Congress planning. Additionally, we seek to inspire our communities youth to explore space as a career through activities such as the science fair, "Meet the Astronauts Night" and model rocket contest.

On behalf of myself and this year's committee, we look forward to joining with you in celebration of our joint heritage and future in space. Welcome to the **Thirtieth Space Congress**.

A handwritten signature in black ink, appearing to read "L. D. Solid". The signature is fluid and cursive, with a long horizontal line extending to the right.

**L. D. Solid**  
**General Chairman**  
**Thirtieth Space Congress**

# Information

## Headquarters/Registration

Headquarters for the **Thirtieth Space Congress** the Holiday Inn, Cocoa Beach. Registration will take place in the Dolphin Room from noon to 5:00 p.m. Monday, April 26, 1992. Registration will continue from 7:00 a.m. to 5:00 p.m. on Tuesday, Wednesday and Thursday, and from 7:00 a.m. to noon on Friday.

PACKAGE REGISTRATION .....	\$130.00
(Includes first five items listed below)	
Tuesday Luncheon .....	10.00
Tuesday Banquet .....	25.00
Wednesday Luncheon .....	10.00
Proceedings .....	70.00
Sessions all four days .....	30.00
Individual Sessions .....	5.00
Individual Sessions (Students) .....	2.00
Golf .....	35.00

Package registration will save you money; however, each item may be purchased individually at the listed price. Telephone contact can be made through the Holiday Inn, (407) 783-2271 (ask for Dolphin Room) or directly by calling (407) 868-2147.

## Press Room

The press facility is located in the Skylab Room of the Howard Johnson Plaza-Hotel. The press facility is staffed and directed by Chuck Morley and J. B. Kump from 12 noon to 5:00 p.m. on Monday and from 8:00 a.m. to 5:00 p.m. on Tuesday, Wednesday and Thursday and 8:00 a.m. to noon on Friday. The telephone number for the press facility is (407) 868-2146.

## Message/Locator Assistance

The sponsoring organization, the Canaveral Council of Technical Societies (CCTS), maintains an office with telephone (407) 868-1623 and fax (407) 783-5579 for convenience of Space Congress participants. It also assists attendees by maintaining a message board. Registrants who wish to leave lodging and local phone information can do so by turning in locator forms, available at the Registration Desk, to the CCTS Message/Locator Desk located in the Dolphin Room, Holiday Inn, or by phone to (407) 868-2345.

## Proceedings

The proceedings of the **Thirtieth Space Congress** are available at the registration desk in the Holiday Inn during the Space Congress. After the close of the Space Congress, additional proceedings can be purchased for \$70 each plus postage from Secretary, CCTS, Post Office Box 245, Cape Canaveral, Florida 32920.

## Exhibits

Exhibits will include a Showcase Exhibit, computer graphics demonstrations and displays of the Space Shuttle, Shuttle Payloads, Space Station, Expendable Launch Vehicles, and other space related activities. The Exhibit Halls will be open to the public in the Cocoa Beach Hilton and the Comfort Inn & Suite Resort, on the following schedules: Tuesday - 11:00 a.m. to 7:00 p.m.; Wednesday - 11:00 a.m. to 8:00 p.m.; and Thursday - 9:00 a.m. to 3:00 p.m.

## Exhibitors

ADC Government Operations  
AlliedSignal  
Analex Space Systems Inc.  
BAMSI, Inc.  
Bionetics Inc.  
Boeing Company  
Brevard Community College  
Brevard Technical Journal  
Communications Concepts, Inc.  
Computer Science Raytheon  
Countdown  
CST  
Digital Equipment Corporation  
EG&G Florida, Inc.  
Empress Software Inc.  
ENSCO  
Final Frontier Magazine  
Florida Institute of Technology  
General Dynamics Space Systems Division  
Harris Corporation  
Hewlett Packard  
Honeywell, Inc.  
I-NET Inc.  
International Business Machines Corporation  
ITT Federal Services Inc.  
Johnson Controls World Services Inc.  
Krieger Publishing Company, Inc.  
Lockheed Engineering and Science Company  
Lockheed Missiles and Space Company  
Lockheed Space Operations Company  
Loral Space Information Systems  
Martin Marietta Astronautics Group  
McDonnell Douglas Corporation  
Morton Thiokol Corporation  
NASA STI  
Naval Ordnance Test Unit  
Naval Research Laboratory  
NYMA, Inc.  
Planning Research Corporation  
Public Broadcast System  
Rockwell International  
Software Publishing Co.  
STC  
Sun Microsystems  
United Technologies Corporation  
University of Central Florida  
Vitro Corporation  
Xerox  
Xerox Engineering System (XES)

## Youth Science Fair

Science fair displays and demonstrations from local secondary school students will be open to the public from 11:00 a.m. to 7:00 p.m. on Tuesday, and 12:00 noon to 8:00 p.m. on Wednesday. The Thursday schedule is from 9:00 a.m. to 1:00 p.m. All Youth Science Fair activities will take place in the Dolphin Room of the Cocoa Beach Holiday Inn. Judging will be conducted from 8:00 a.m. to 12:00 p.m. on Wednesday, April 22. The awards will be presented to the winners at the "Meet the Astronauts" panel session to be held at the Howard Johnson Plaza-Hotel in Cocoa Beach at 7:00 p.m. on Thursday, April 29.

## Pioneers' Day

The Pioneers' Day Banquet '93 will be held on Friday, April 30, at the Officers' Club, Patrick Air Force Base.

Social Hour: 6:30 p.m.  
Dinner: 7:30 p.m.  
Speaker: 8:30 p.m.  
Gilbert D. Rye  
Senior Vice-President of Business  
Development  
Orbital Sciences Corporation

Registration is April 21, 22 and 23 at the Dolphin Room, Holiday Inn, Cocoa Beach, and 5:30 to 6:30 p.m. at the Officers' Club on April 24.

## Space Congress Golf Tournament

Golfers will be able to enjoy a tournament at the Patrick AFB Course on Friday, April 30.

The tournament will be a four player, select shot format, as in the past. You may sign up with **one partner** or by yourself. The tournament committee will assign teams based on playing ability. Foursomes may sign up if they provide a combined total certifiable handicap of 55 or higher. Fill in your name and average score or handicap for 18 holes on the registration form, along with the same for your partner, and enclose \$35, each person. A maximum of 144 players will be registered on a first come, first in basis. Lunch, refreshments on the course, green fees, carts, and trophies are included in the fee. Buffet lunch from 11:00 a.m., and shotgun start at 12:30 p.m. will allow completion in time for Pioneers' Banquet attendance. Maps are available at the Registration Desk.

## Canaveral Council of Technical Societies

### CCTS Member Societies:

Air Force Association  
American Institute of Aeronautics and Astronautics  
American Institute of Architects  
American Meteorological Society  
American Society of Civil Engineers  
American Society of Heating, Refrigeration and A/C Engineers  
American Society for Industrial Security  
American Society of Mechanical Engineers  
American Society for Nondestructive Testing  
American Society for Quality Control  
American Society of Safety Engineers  
American Society for Training and Development  
American Welding Society  
Armed Forces Communication Electronics Association  
Florida Engineering Society  
Florida Space Business Roundtable  
Institute of Electrical and Electronic Engineers  
Institute of Industrial Engineers  
Instrument Society of America  
Missile, Space and Range Pioneers, Inc.  
NASA Alumni League  
National Contract Management Association  
National Space Club  
National Technical Association  
Society for the Advancement of Materials and Process Engineering  
Society for Technical Communications  
Society of Logistics Engineers  
Society of Manufacturing Engineers  
Society of Photo-Optical Instrumentation Engineers  
Society of Women Engineers

## Associate Members:

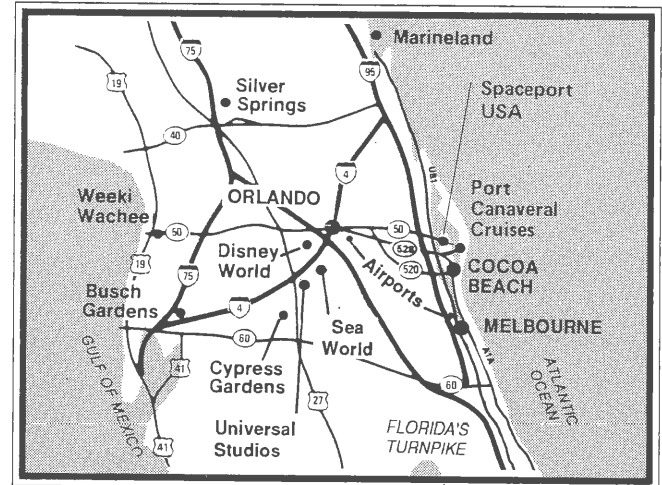
Association for Quality and Participation  
National Management Association, Florida Space Coast Council  
USAF Space & Missile Museum Foundation

Many of the societies will have educational/promotional brochures/information on display at the CCTS Desk at the Holiday Inn and the Hilton Exhibit Center. Attendees are invited to stop by and review this material.

## Attraction Centers

Late April in Florida is a delightful time of year for the entire family. The weather is pleasant, the hardy find the Atlantic warm enough for swimming and tourist attractions are not yet crowded. **Cocoa Beach** offers a long stretch of swimming beach, surfing areas, and both deep-sea and shore fishing. Three and four day cruises aboard the **SS Oceanic**, the **SS Atlantic**, the **SS Majestic**, the **Carnivale** or the **Mardi Gras** can be enjoyed from Port Canaveral. Bus tours of the **Kennedy Space Center** and **Cape Canaveral Air Force Station** are available from the **Spaceport, USA** where a free exhibit-filled space museum can be enjoyed by both children and adults.

Within one to two hours drive is a world of vacation fun at **Walt Disney World** in the **Magic Kingdom**, **Epcot Center**, or **Disney/MGM Studios**, **Universal Studios, Florida** - **Sea World**, one of America's finest marine attractions - the mystery and excitement of Africa in **Busch Gardens** - famed Glass Bottom boats at **Silver Springs** - the beautiful gardens and daily water ski revue with lovely aquamaids at **Cypress Gardens**.



# Program

TUESDAY, APRIL 27

**KEYNOTE ADDRESS (8:30 a.m. to 9:00 a.m.)**

**Howard Johnson Plaza-Hotel, Challenger Main Ballroom**

**Introductions:** L. D. Solid  
General Chairman

**Speaker:** General Merrill M. McPeak  
Chief of Staff, USAF

General Merrill A. McPeak is chief of staff of the U.S. Air Force, Washington, D.C. As chief, he serves as the senior uniformed Air Force officer over 900,000 people serving at approximately 3,000 locations in the United States and overseas.

General McPeak was born January 9, 1936, in Santa Rosa, Calif. He has earned a bachelor of arts degree in economics and a master's degree in international relations. During the period 1970-1979, the general completed Armed Forces Staff College, National War College, and the executive development program at the University of Michigan Graduate School of Business.

The general was a distinguished graduate of the Air Force Reserve Officer Training Corps program and entered the Air Force in November 1957. He completed pilot training at Hondo Air Force Base, Texas, and Vance Air Force Base, Okla., and received pilot wings in January 1959. General McPeak was designated a distinguished graduate of flying training.

His first operational assignment was flying F-104 Starfighters with the 436th Tactical Fighter Squadron, George Air Force Base, Calif. He subsequently transferred to the 79th Tactical Fighter Squadron, 20th Tactical Fighter Wing, Royal Air Force Station Woodbridge, England, where he flew F-100 Super Sabres.

In September 1965 General McPeak returned to Luke Air Force Base as a gunnery instructor and later served as wing weapons officer for the F-104G program.

From December 1966 to December 1968 General McPeak flew the solo and lead solo positions with the U.S. Air Force Air Demonstration Squadron, the Thunderbirds. He performed in nearly 200 official air shows in the United States and abroad.

The general served as an F-100 tactical fighter pilot with the 37th Tactical Fighter Wing, Phu Cat Air Base, Vietnam, then as operations officer and commander of the "Misty" high-speed forward air controller unit. During his tour of duty in Vietnam, he flew 269 combat missions.

The general took command of the 513th Combat Support Group, Royal Air Force Station Mildenhall, England, in July 1976 and in July 1977 became vice commander of the 406th Tactical Fighter Training Wing, Zaragoza Air Base, Spain.

From July 1978 to February 1980 General McPeak was assistant chief of staff for current operations, Allied Air Forces Central Europe. He then assumed command of the 20th Tactical Fighter Wing, Royal Air Force Station Upper Heyford, England. In June 1981 he was assigned to Headquarters U.S. Air Forces in Europe at Ramstein Air Base, West Germany, as chief of staff. In October 1982 he became deputy chief of staff for plans, Headquarters Tactical Air Command, Langley Air Force Base, Va. From May 1985 to June 1987 he assumed command of 12th Air Force and U.S. Southern Command Air Forces, Bergstrom Air Force Base, Texas. He became commander in chief, Pacific Air Forces, Hickam Air Force Base, Hawaii, in July 1988. He assumed his present position in October 1990.

General McPeak is a command pilot and parachutist with more than 6,000 flying hours in a variety of aircraft, principally fighters. The air



forces of Germany, Spain, Mexico, Thailand, Yugoslavia, France, Israel, Russia, Bulgaria, Venezuela and Poland have awarded him pilot wings. He is a member of the Council on Foreign Relations, New York City, and the International Institute for Strategic Studies, London.

He was promoted to general August 1, 1988.

General McPeak is married to the former Elynor Moskowitz of San Diego. They have two sons, Mark and Brian.

**PANEL SESSION I (9:00 a.m. to 11:30 a.m.)**

**Howard Johnson Plaza-Hotel, Challenger Main Ballroom**

## SPACE RESEARCH AND DEVELOPMENT

**Panel Chairman:** Rear Admiral Herbert A. Browne, Jr., USN,  
Commander, Naval Space Command, Dahlgren, VA

**Session Organizer:** Capt. Bruce Stevenson, USAF, Air Force  
Space Command, 45th Space Wing, Patrick AFB, FL

### MEMBERS:

Dr. Peter G. Pappas, Chief Scientist, USA Strategic Defense Command, Arlington, VA

Dr. John R. Davis, Chief Scientist, Space and C4 Systems Requirements, Navy Department, OPNAV-N6H, Pentagon, Washington, D.C.

Peter Wilhelm, Director, Navy Center for Space Technology, Washington, D.C.

MGen. Vernon L. Conner, USA, U.S. Space Command, Executive Director for Joint Strategic Defense Planning Staff, Peterson AFB, CO

BGen. Jimmy R. Morrell, USAF, Air Force Space Command, Commander, 45th Space Wing, Patrick AFB, FL

BGen. Robert Dickman, USAF, Air Force Space Command, Director of Plans, Peterson AFB, CO

**SPACE VIDEOS (9:00 a.m. to 5:00 p.m.)**

**Howard Johnson Plaza-Hotel, Skylab Room**

**LUNCHEON (12:00 noon to 1:30 p.m.)**

**Holiday Inn, Manatee Room**

**Introductions:** L. D. Solid  
General Chairman

**Speaker:** Miles (Mike) Ross  
Past Deputy Director  
Kennedy Space Center, FL

Mike Ross graduated from MIT with a degree in Mechanical Engineering and Engineering Management.

His first participation in missile and space programs was at the Applied Physics Laboratory of The Johns Hopkins University, where he was a member of the Senior Staff. He designed components and procedures for the Proximity Fuze, a radar-controlled gun director, and the Terrier surface-to-air missile program. He was also Flight Test Director for Terrier missiles at the Naval Ordnance Test Station, China Lake, California.

In 1956, Mike joined the Ramo Woolridge Corporation as project manager of the Thor missile program at Cape Canaveral, with responsibility for systems engineering



and technical direction. He later became Director of Florida Operations for Ramo Woolridge, now TRW.

In 1967, he moved to the Kennedy Space Center, first as Deputy Center Director for Operations, and in 1968 as Deputy Center Director. He received NASA's Exceptional Service Medal, the Medal for Outstanding Leadership, and the Distinguished Service Medal.

In 1977 Mike returned to TRW as European Regional Manager, and was based in Brussels. In this position, he worked with NATO, SHAPE, and provided technical and marketing assistance to companies in seven countries which were starting or expanding operations in space programs.

Mike and wife, Patricia, have four sons - a naval architect, an Army colonel, a United Airline pilot, and an advertising manager.

Pat and Mike retired in 1984 and are living in Cocoa Beach. He holds a Commercial Pilot's license, and is now trying to fly a radio controlled model helicopter.

## PAPER SESSION I (2:00 p.m. to 5:00 p.m.)

### A. ADVANCED TECHNOLOGY DEVELOPMENT

Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairman: Col. Louis A. Kouts, Director, National Test Bed SDIO/SDT Pentagon, Washington, D.C.

Session Organizer: LT. Jeffery P. Jacques, USAF, Assistant Installation Mobility Officer, 45th Logistics Support Squadron, Patrick AFB, FL

#### 1. SPACE TECHNOLOGY REQUIREMENTS AND INTERDEPENDENCY FOR NATIONAL COMPETITIVENESS

Dr. Kumar Krishen, NASA, Johnson Space Center, Houston, TX

#### 2. IN-SPACE WELDING VISIONS & REALITIES

David Tamir, Rockwell International Corporation, Space Systems Division, Kennedy Space Center, FL

Lee Flanigan, Rockwell International Corporation, Rocketdyne Division, Marshall Space Flight Center, Huntsville, AL

Dr. Thomas A. Siewert, National Institute of Standards and Technology, Materials Processing Group, Boulder, CO

Dr. Koichi Matsubuchi, Massachusetts Institute of Technology, Department of Ocean Engineering, Cambridge, MA

Dr. Thomas W. Eagar, Massachusetts Institute of Technology, Department of Materials Science & Engineering, Cambridge, MA

Dr. Renjeng Su, University of Colorado at Boulder, Center for Space Construction, Boulder, CO

#### 3. THE NAVY NUCLEAR PROGRAM AS AN ANALOGUE OF LONG DURATION, NUCLEAR POWERED, MANNED SPACE MISSIONS

LT. John Anthony Camara, USN, P.E., Officer Department, Naval Nuclear Power School, Orlando, FL

Dr. E. F. Strother, Adjunct Professor, Florida Institute of Technology, Melbourne, FL

#### 4. IS IT SEP YET?

C. Uphoff, Ball Space Systems Division, Boulder, CO

R. Reinert, Ball Space Systems Division, Boulder, CO

J. R. French, JRF Engineering, La Canada, CA

#### 5. MODELING CURRENT AND FUTURE LAUNCH VEHICLE PROCESSING USING OBJECT-ORIENTED SIMULATION TECHNIQUES

D. G. Linton, Associate Professor, Electrical & Computer Engineering Department, University of Central Florida, Orlando, FL

S. Khajenoori, Associate Professor, Electrical & Computer Engineering Department, University of Central Florida, Orlando, FL

M. Heileman, Advanced Programs Engineer, Rockwell International Corporation, Space Systems Division, Kennedy Space Center, FL

K. Halder, Graduate Research Assistant, Electrical & Computer Engineering Department, University of Central Florida, Orlando, FL

H. Cat, Graduate Research Assistant, Electrical & Computer Engineering Department, University of Central Florida, Orlando, FL

V. Bullington, Graduate Research Assistant, Electrical & Computer Engineering Department, University of Central Florida, Orlando, FL

G. Hebert, Graduate Research Assistant, Electrical & Computer Engineering Department, University of Central Florida, Orlando, FL

### B. TODAY'S VISION (SEI, NLS, AEROSPACE PLANE)

Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: Col. Steven C. Stadler, USAF, DCS/ Requirements, Headquarters AFSPACECOM, Peterson AFB, CO

Session Organizer: Capt. Mike Rampino, USAF, Studies & Analysis Officer, Plans Directorate, 45th Space Wing, Patrick AFB, FL

#### 1. FACILITY CONCEPT FOR NASP DERIVED VEHICLES

David A. Luke, Jr., Mechanical Engineer, Merrick & Co., Denver, CO

#### 2. IN-SPACE OPERATIONS FOR LUNAR AND MARS SPACE TRANSFER VEHICLES

James L. Raper, Sr., Deputy Manager, Space Exploration Initiative Office, NASA, Langley Research Center, Hampton, VA

Rick C. Vargo, Technical Specialist, McDonnell Douglas Space Systems, Kennedy Space Center, FL

#### 3. CONCEPTUAL DESIGN OF A CARGO LANDER FOR THE FIRST LUNAR OUTPOST

Michael J. Wright, University of Minnesota, NASA, Marshall Space Flight Center, Summer Fellow, Huntsville, AL

#### 4. THE LUNAR CAMPSITE MISSION CONCEPT

Carl M. Case, Manager, Exploration Systems Office, Boeing Defense & Space Group, Missiles & Space Division, Huntsville, AL

#### 5. CONTINUOUS IMPROVEMENT: TRANSFORMING YESTERDAY'S REALITY INTO TOMORROW'S VISION

Mina Akhavi, Rockwell International, Space Systems Division, Downey, CA

Patrick Antony, Rockwell International, Space Systems Division, Downey, CA

Larry Davidoff, Rockwell International, Space Systems Division, Downey, CA

Gerard Hanley, Rockwell International; Space Systems Division, Downey, CA

William Johnson, Rockwell International, Space Systems Division, Downey, CA

6. **RELIABILITY, RECOVERY, AND REUSE; THE THREE R'S OF A NATIONAL LAUNCH STRATEGY**

Ed Bangsund, Director of Space Product Area Marketing, Boeing Defense & Space Group, Aerospace & Electronics Division, Seattle, WA

Vince Caluori, Launch Vehicle Program Manager, Boeing Defense & Space Group, Aerospace & Electronics Division, Seattle, WA

C. **INTERSTELLAR INITIATIVES**

Holiday Inn, Manatee Rooms A and B

Session Chairman: Dr. Samuel T. Durrance, Center for Astrophysical Science, Johns Hopkins University, Baltimore, MD

Session Organizer: Suzanne Hodge, Rockwell International Corp., Space Systems Division, Kennedy Space Center, FL

1. **INTERSTELLAR TRANSPORTATION: AN ENABLING TECHNOLOGY FOR INTERSTELLAR CIVILIZATIONS**

Gary L. Bennett, NASA, Office of Advanced Concepts and Technology, Washington, D.C.

2. **EVOLUTION OF LUNAR BASED OPTICAL ASTRONOMY FACILITIES**

John D. Hilchey, NASA, Program Development Directorate, Marshall Space Flight Center, Huntsville, AL

Max E. Nein, NASA, Program Development Directorate, Marshall Space Flight Center, Huntsville, AL

3. **MAXIMIZING WORLD BENEFITS FROM SPACE ENDEAVORS**

William H. Siegfried, Director of Advanced Systems, McDonnell Douglas Aerospace, Huntington Beach, CA

4. **ROBOTICS FOR INTERSTELLAR MISSIONS**

Eric Rhodes, NASA, Advanced Technology Office, Kennedy Space Center, FL

A. J. Mauceri, Rockwell International Corp., Space Systems Division, Downey, CA

Margaret M. Clarke, Rockwell International Corp., Space Systems Division, Downey, CA

Thomas S. Lindsay, Rockwell International Corp., Space Systems Division, Downey, CA

5. **MULTIFUNCTIONAL AIR REVITALIZATION SYSTEMS: COMBINED CO<sub>2</sub>-TRACE CONTAMINANT REMOVAL USING SOLID AMINES**

Scott R. Johnson, Rockwell International Corporation, Space Systems Division, Downey, CA

George G. Garrard, Rockwell International Corporation, Space Systems Division, Downey, CA

Shirley M. Mitchell, Rockwell International Corporation, Space Systems Division, Downey, CA

6. **THE ROLE OF ADVANCED ROBOTIC SYSTEMS IN INTERSTELLAR EXPLORATION**

Dr. Joseph A. Angelo, Jr., Director Advanced Technology, Science Applications International Corp., Melbourne, FL

**SPACE CONGRESS BANQUET**

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

Social Hour: 7:00 p.m.

Dinner: 8:00 p.m.

Program: 9:00 p.m.

Introductions: L. D. Solid

General Chairman

Speaker: Daniel S. Goldin

Administrator, NASA Headquarters  
Washington, D.C.

Daniel S. Goldin became the ninth NASA Administrator on April 1, 1992. Prior to his nomination, he was Vice President and General Manager of the TRW Space & Technology Group, Redondo, Calif., where he managed the development and production of advanced spacecraft, technologies and space science instruments.

Goldin began his career as a research scientist at NASA's Lewis Research Center, Cleveland, Ohio, from 1962 to 1967. While there, he worked on electric propulsion systems for human interplanetary travel.

He has held positions at TRW since 1967 when he became a member of the technical staff.

During his tenure as Vice President and General Manager, the Space and Technology Group pioneered advanced technologies including superconductivity, composites and electrooptics and built 13 spacecraft that continue to operate successfully in orbit. These include the launch and operation of NASA's Tracking and Data Relay Satellite-5 and the Compton Gamma Ray Observatory. The group also has worked on other NASA programs, including the successful grinding and testing of the world's two largest X-ray mirrors for the Advanced X-ray Astrophysics Facility.

The Space & Technology Group won the 1990 Goddard Award for Quality and Productivity, was a finalist in 1991 for NASA's highest quality award for contractors - the George M. Low trophy - and in 1992, the NASA/TRW team received the National Space Club's Nelson P. Jackson Aerospace Award for the Compton Gamma Ray Observatory.

Prior to that position, Goldin managed several advanced technology programs of high national priority. He led TRW's efforts in the design, development and production of the communications payload for the U.S. Air Force's MILSTAR communications satellite and managed the direct broadcast payload for NASA's communications technology that became the forerunner of current direct broadcast television systems. He also has held leadership positions on several NASA advanced studies for interplanetary, asteroid-flyby and comet rendezvous missions.

Goldin, born in New York City on July 23, 1940, received a Bachelor of Science degree in mechanical engineering in 1962 from the City College of New York. He is married to the former Judith Linda Kramer of New York City. They have two daughters, Aerial and Laura, who reside in California.





**WEDNESDAY, APRIL 28**

**PANEL SESSION II (8:30 a.m. to 11:30 a.m.)**

**Howard Johnson Plaza-Hotel, Challenger Main Ballroom**

**SPACE OPERATIONS**

Panel Chairman: General Jeremiah (Jed) W. Pearson, III, Associate Administrator for Space Flight, NASA Headquarters, Washington, D.C.

Session Organizer: Tim Ferris, McDonnell Douglas Space Systems, Kennedy Space Center, FL

**MEMBERS:**

Colonel Vladimir G. Titov, Mission Specialist (Cosmonaut), NASA, Johnson Space Center, Houston, TX

Dr. Bonnie J. Dunbar, Mission Specialist (Astronaut), NASA, Johnson Space Center, Houston, TX

Sergei Krikalev, Mission Specialist (Cosmonaut), NASA, Johnson Space Center, Houston, TX

James L. Smothermon, Deputy Manager, Space Shuttle Integrations and Operations Office, NASA, Johnson Space Center, Houston, TX

Guy S. Gardner, Deputy Associate Administrator (Russian Affairs), Office of Space Flight, NASA, Washington, D.C.

**SPACE VIDEOS (9:00 a.m. to 5:00 p.m.)**

**Howard Johnson Plaza-Hotel, Skylab Room**

**LUNCHEON (12:00 noon to 1:30 p.m.)**

**Holiday Inn, Manatee Room**

Introductions: L. D. Solid  
General Chairman

Speaker: General Charles A. Horner  
Commander in Chief, U.S. Space Command  
Peterson AFB, CO

General Charles A. Horner is commander in chief of North American Aerospace Defense Command and the United States Space Command, and commander of Air Force Space Command at Peterson Air Force Base, Colo.

General Horner was born October 19, 1936, in Davenport, Iowa. He has earned a bachelor of arts degree and a master's degree in business administration. During the period 1967-1976, the general completed Squadron Officer School, Armed Forces Staff College, Industrial College of the Armed Forces and National War College.

The general was commissioned through the Air Force Reserve Officer Training Corps and was awarded pilot wings in November 1959. After completing F-100 training, General Horner served as an F-100 pilot with the 492nd Tactical Fighter Squadron, Royal Air Force Station Lakenheath, England.



The general served a temporary tour of duty with the 388th Tactical Fighter Wing at Korat Royal Thai Air Force Base, Thailand. While there, he flew 41 combat missions in the F-105 over North Vietnam. When he returned to the United States, he was assigned to Nellis Air Force Base, Nev., as an F-105 instructor pilot. In May 1967, the general returned to Korat Royal Thai Air Force Base as an F-105 Wild Weasel pilot with the 388th tactical Fighter Wing and flew 70 more combat missions over North Vietnam.

He was later assigned to Nellis Air Force Base. He served as a F-105 instructor, and as an F-105 liaison officer with the Air Force Tactical Fighter Weapons Center. General Horner transferred to Langley Air Force Base, Va., where he was an air operations staff officer. After graduating from Armed Forces Staff College in January 1972, he was assigned to Headquarters U.S. Air Force in Washington, D.C.

The general was assigned as commander of the 23rd North American Aerospace Defense Command Region and Tactical Air Command Air Division at Tyndall Air Force Base, Fla. Later, he became commander of the Air Force Air Defense Weapons Center at Tyndall Air Force Base. He was assigned as deputy chief of staff for plans at Tactical Air Command headquarters. The general became commander of 9th Air Force and U.S. Central Command Air Forces at Shaw Air Force Base, S.C., in March 1987.

In August 1990, General Horner deployed to Saudi Arabia as the forward commander for U.S. Central Command as well as the commander of U.S. Central Command Air Forces. There he assumed command of all U.S. and Allied air assets for the duration of Operation Desert Shield and Desert Storm. He returned to Shaw Air Force Base in April 1991. He assumed his present position on June 30, 1992.

The general is a command pilot with more than 5,300 flying hours. He has maintained proficiency in a variety of modern fighter aircraft, including the F-15 and F-16. His U.S. military awards and decorations include the Distinguished Service Medal with one oak leaf cluster, Silver Star with one oak leaf cluster, Legion of Merit, Distinguished Flying Cross, Meritorious Service Medal with two oak leaf clusters, Air Medal with 10 oak leaf clusters, Air Force Commendation Medal with three oak leaf clusters, Combat Readiness Medal, National Defense Service Medal with one bronze service star, Armed Forces Expeditionary Medal with service star, Vietnam Service Medal with service star and Republic of Vietnam Campaign Medal.

In addition to his U.S. military awards, General Horner has been decorated with Canada's Meritorious Service Cross and honored by France, Pakistan and the sovereign states of Bahrain, Kuwait, Saudi Arabia and the United Arab Emirates.

He was promoted to general on June 19, 1992.

General Horner is married to the former Mary Jo Gitchell of Cresco, Iowa. They have three children: Susan, John and Nancy.

**PAPER SESSION II (2:00 p.m. to 5:00 p.m.)**

**A. CURRENT LAUNCH SYSTEMS**

**Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms**

Session Chairman: Lee R. Scherer, Consultant, Commercial Launch Services, General Dynamics Corporation, San Diego, CA

Session Organizer: Shaman Mullick, Advanced Programs, Harris Space Systems Corporation, Rockledge, FL

**1. PUBLIC SPACE LAUNCH ACQUISITION: A COMPARATIVE CASE STUDY**

Capt. Lee W. Rosen, USAF, Upper Stage Program Office, San Pedro, CA

Capt. Kenneth R. Leeson, USAF, Upper Stage Program Office, San Pedro, CA

2. LAUNCH SYSTEM DEVELOPMENT IN THE PACIFIC RIM  
Dr. Barbara A. Stone, Special Assistant for Industry Liaison, NASA, Office of Commercial Programs, Washington, D.C.  
John R. Page, Head, Aerospace Engineering, School of Mechanical and Manufacturing Engineering, The University of New South Wales, Kensington, NSW, Australia

3. REPORT OF THE COMSTAC TASK GROUP ON SOVIET ENTRY INTO THE WORLD SPACE MARKET  
Robert D. Jones, Program Manager, Advanced Technology, Rocketdyne Division, Rockwell International Corporation, Canoga Park, CA

4. USE OF EXCESS MISSILE SYSTEMS FOR COMMERCIAL LAUNCHES  
Donald K. (Deke) Slayton, Director, Corporate Business Development, Aerospace Systems Group, EER Systems Corporation, Seabrook, MD

5. NASA'S RESEARCH AND TECHNOLOGY PROGRAM FOR ENHANCING THE COMPETITIVENESS OF THE CURRENT U.S. EXPENDABLE LAUNCH FLEET  
David R. Stone, Manager, Advanced Transportation and Technology, Office of Advanced Concepts and Technology, NASA Headquarters, Washington, D.C.

6. EXPENDABLE LAUNCH VEHICLES FOR SPACE STATION FREEDOM DELIVERY MISSIONS  
Otto Steinbronn, Advanced Programs Director, General Dynamics, Commercial Launch Services, San Diego, CA

**B. PAST AND FUTURE PAYLOADS (2:00 p.m. to 5:30 p.m.)  
Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms**

Session Chairman: JoAnn H. Morgan, Director, Payloads Projects Management, NASA, Kennedy Space Center, FL

Session Organizer: Shirley Green, Payload Support Office, NASA, Kennedy Space Center, FL

1. THE TRACKING AND DATA RELAY SATELLITE SYSTEM  
Charles S. Vanek, TDRS Project Manager, Goddard Space Flight Center, Greenbelt, MD
2. DEVELOPMENT OF SPACE SYSTEM PAYLOADS FOR EARTH ORBIT AND PLANETARY APPLICATIONS  
Sidney P. Saucier, Manager, Space Systems Projects, Marshall Space Flight Center, Huntsville, AL
3. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S MICROGRAVITY SCIENCE AND APPLICATIONS PROGRAM  
Mary E. Kicza, Microgravity Science and Applications Division, Office of Space Science and Applications, NASA, Washington, D.C.
4. LIFE SCIENCES SHUTTLE FLIGHTS - 15 YEARS  
Bonnie P. Dalton, Chief, Payload Operations Branch, Ames Research Center, Moffet Field, CA  
Robert P. Hogan, Deputy Chief, Space Life Sciences Payload Office, Ames Research Center, Moffet Field, CA  
Dr. Gary C. Jahns, Sciences Operations Branch, Ames Research Center, Moffet Field, CA
5. EVOLUTION OF BIOMEDICAL PAYLOADS TO EXPAND HUMAN PRESENCE IN SPACE  
Howard J. Schneider, Ph.D., Space and Life Sciences Directorate, NASA, Johnson Space Center, Houston, TX

Carolyn L. Huntoon, Ph.D., Space and Life Sciences Directorate, NASA, Johnson Space Center, Houston, TX  
Gayle M. Karamanos, Mission Support Scientist, General Electric Government Services, Houston, TX

6. SHUTTLE/MIR JOINT MISSION  
David Stu Grissom, Assistant Manager, Program Integration, NASA, Johnson Space Center, Houston, TX
7. THE MARS ENVIRONMENTAL SURVEY (MESUR) NETWORK AND PATHFINDER MISSIONS  
John B. McNamee, Ph.D., Mission Design/Navigation Manager, Jet Propulsion Laboratory, Pasadena, CA
8. NASA EARTH OBSERVING (EOS) PROGRAM OVERVIEW AND THE EOS SPACE SEGMENT  
Ray Roberts, EOS Project Director, NASA, Washington, D.C.  
Christopher J. Scolese, EOS-AM Project Manager, Goddard Space Flight Center, Greenbelt, MD

**C. COMMERCIAL SPACE DEVELOPMENT  
Holiday Inn, Manatee Rooms A & B**

Session Chairman: John G. Mannix, Associate General Counsel for Intellectual Property, NASA Headquarters, Washington, D.C.

Session Organizer: Chris Cook, EG&G, Kennedy Space Center, FL

1. THE U.S. COMMERCIAL SPACE LAUNCH INDUSTRY: RESPONDING TO THE MARKET FORCES  
Ralph De Palma, Consultant, Merritt Island, FL
2. TECHNOLOGY TRANSFER AND THE OFFICE OF ADVANCED CONCEPTS AND TECHNOLOGY  
John C. Mankiris, Office of Advanced Concepts and Technology, NASA, Washington, D.C.  
Jonathan Root, Office of Advanced Concepts and Technology, NASA, Washington, D.C.  
Carissa Bryce Christensen, Princeton Synergetics, Inc., Princeton, NJ  
Robert G. Steen, Princeton Synergetics, Inc., Princeton, NJ
3. NASA'S COMMERCIAL MICROGRAVITY ADVANCES  
Richard H. Ott, Director, Commercial Flight Experiment Division, Office of Advanced Concepts and Technology, NASA Headquarters, Washington, D.C.
4. LOW COST ACCESS TO SPACE WITH THE STARFIRE/CONESTOGA LAUNCH VEHICLE SYSTEMS  
Bill Saavedra, Director, Corporate Business Development, Aerospace Systems Group, EER Systems Corporation, Seabrook, MD
5. SPACE LAUNCH INFRASTRUCTURE  
Linda Hull Strine, Deputy Associate Director for Program Affairs, U.S. Department of Transportation, Washington, D.C.  
Carissa Bryce Christensen, Princeton Synergetics, Inc., Princeton, NJ  
Robert G. Steen, Princeton Synergetics, Inc., Princeton, NJ

**EXHIBIT CENTER RECEPTION (6:00 p.m. to 7:30 p.m.)  
Cocoa Beach Hilton and Comfort Inn & Suite Resort**

## THURSDAY, APRIL 29

**PANEL SESSION III (8:30 a.m. to 11:30 a.m.)**  
Howard Johnson Plaza-Hotel, Challenger Main Ballroom

### SPACE STATION

Panel Chairman: Richard (Dick) Kohrs, Director, Space Station Freedom, NASA Headquarters, Washington, D.C.

Session Organizer: Joel Dodds, McDonnell Douglas Space Systems, Kennedy Space Center, FL

#### MEMBERS:

Col. Bryan D. O'Connor, Deputy Associate Administrator, Office of Space Flight, NASA Headquarters, Washington, D.C.

Jerry W. Craig, Manager, ACRV Project Office, NASA, Johnson Space Center, Houston, TX

Dr. Earle K. Huckins, Director, Space Station Engineering, Washington, D.C.

**SPACE VIDEOS (9:00 a.m. to 5:00 p.m.)**  
Howard Johnson Plaza-Hotel, Skylab Room

**PAPER SESSION III (1:00 p.m. to 4:00 p.m.)**

#### A. SPACE STATION

Howard Johnson Plaza-Hotel, Atlanta/Discovery Rooms

Session Chairman: Robert W. Moorehead, Deputy Director, Space Station Freedom Program and Operations, NASA, Reston, VA

Session Organizer: Gert Adkins, McDonnell Douglas Space Systems, Kennedy Space Center, FL

- RACK LEVEL TEST FACILITY - THE COLUMBUS APM PAYLOAD VERIFICATION TOOL**  
Dr. Wilfried Schroeder, Utilization and Mission Planning, ERNO Raumfahrttechnik GmbH, Bremen, Germany  
D. Husung, Utilization and Mission Planning, ERNO Raumfahrttechnik GmbH, Bremen, Germany  
H. Pieterek, ESA, Noordwijk, Bremen, Germany
- SPACE STATION UTILIZATION INITIATIVES**  
Mark Ubran, DSO, Utilization & Operations Office, NASA, Reston, VA
- INTERNATIONAL SCIENCE FACILITY**  
Stanley Goldberg, DSX, International Programs Office, NASA, Reston, VA  
Elizabeth Carter, Space Station Freedom Program Office, ESA, Bremen, Germany
- SPACE STATION AVIONICS ARCHITECTURE**  
John Rush, DSS, System Engineering & Integration Office, NASA, Reston, VA

#### B. SPACE EDUCATION

Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: R. Gilbert Moore, Physics Department, Utah State University, Logan, UT

Session Organizer: Priscilla Elfrey, Patent Counsel and Technology Transfer Office, NASA, Kennedy Space Center, FL

- FLORIDA'S SPACE EDUCATION DEVELOPMENT PROGRAM**  
Gerard G. Ventre, Ph.D., Technical Director and Associate Director, FSGC, University of Central Florida, Orlando, FL
  - A HIGH-SCHOOL LEVEL SUMMER SPACE EDUCATION SEMINAR**  
Dr. Stephen Horan, New Mexico Space Grant Consortium, New Mexico State University, Las Cruces, NM
  - CREATING SPACE EXPERIMENT OPPORTUNITIES FOR THE ACACEMIC COMMUNITY**  
James A. Ralph, Spaceport Florida Authority, Cocoa Beach, FL  
Edward Ellegood, Spaceport Florida Authority, Cocoa Beach, FL
  - NEW INITIATIVES IN UNDERGRADUATE AND GRADUATE SPACE EDUCATION**  
Dr. David C. Webb, Embry Riddle Aeronautical University, Daytona Beach, FL
  - DISTANCE LEARNING AS A TRAINING AND EDUCATION TOOL:**  
Dr. David L. Hosley, Manager, Technical Training, Lockheed Space Operations Company, Kennedy Space Center, FL  
Sherry L. Randolph, Visual Communication Specialist, Lockheed Space Operations Company, Kennedy Space Center, FL
  - SPACE EDUCATION BENEFITS FROM INDUSTRIAL CONSORTIA**  
Barbara A. Stone, Ph.D., Office of Advanced Concepts and Technology, NASA, Washington, D.C.  
John R. Page, The University of New South Wales, Kensington, NSW, Australia
- #### C. 30 YEARS OF PROGRESS, SPINOFFS FROM SPACE TECHNOLOGY
- Holiday Inn, Manatee Rooms A & B
- Session Chairman: Dr. Doris J. Rouse, Director, NASA Technology Applications Team, Research Triangle Institute, Research Triangle Park, NC
- Session Organizer: Don Capone, Southern Technology Application Center, Kennedy Space Center, FL
- OUTER SPACE TO INNER SPACE: THE STORY OF THE TRANSFER OF NASA EXCIMER LASER TECHNOLOGY TO MEDICAL ANGIOPLASTY PRODUCTS**  
Dr. James Laudenslager, President, Advanced Interventional Systems, Inc., Irvine, CA
  - FLOW CYTOMETRY FOR CLINICAL USE AND SPACE-BASED RESEARCH**  
Dr. David Robinson, M.D., Associate Professor of Surgery, Division of Oncology, University of Miami School of Medicine, Miami, FL  
Dr. Gerry Taylor, Ph.D., Associate Mission Specialist, Life Sciences Division, NASA, Johnson Space Center, Houston, TX

3. **MEDITRAIN-MEDICAL INSTRUMENTATION AS SPIN-OFF FROM SPACE APPLICATION**

J. Schneider, NOVA Aerospace, Vienna, Austria

W. Bumba, Vienna, Austria

M. Mossaheb, Vienna, Austria

N. Bachl, Dept. of Sports Physiology, University of Vienna, Vienna, Austria

R. Baron, Dept. of Sports Physiology, University of Vienna, Vienna, Austria

KH. Tschan, Dept. of Sports Physiology, University of Vienna, Vienna, Austria

4. **COMMERCIALIZING STRATEGIC DEFENSE INITIATIVE TECHNOLOGY**

Nick Montanarelli, Deputy Director, Technology Application Office, Office of the Secretary of Defense, Washington, D.C.

5. **STRATEGIC FACTORS IN THE DEVELOPMENT OF THE NATIONAL TECHNOLOGY TRANSFER NETWORK**

Jonathan Root, Program Manager, NASA Technology Transfer Program, Office of Advanced Concepts and Technology, Washington, D.C.

Barbara A. Stone, Ph.D., Office of Advanced Concepts and Technology, Washington, D.C.

6. **DIVIDENDS FROM SPACE; HOW NASA TECHNOLOGY HAS PROVIDED A COMPETITIVE ADVANTAGE FOR U.S. INDUSTRY**

Doris J. Rouse, Ph.D., Director, NASA Technology Application Team, Research Triangle Park, NC

**SPACE CONGRESS RECEPTION (6:00 p.m. to 8:00 p.m.)**

Holiday Inn, Observation Deck

**PANEL SESSION IV (7:00 p.m. to 9:00 p.m.)**

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**MEET THE ASTRONAUTS**

Panel Chairman: Robert L. Crippen, Center Director, NASA, John F. Kennedy Space Center, FL

Astronauts: As available between training commitments.

**FRIDAY, APRIL 30**

**PANEL SESSION V (8:30 a.m. to 11:30 a.m.)**

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**YESTERDAY'S VISION IS TOMORROW'S REALITY**

Panel Chairman: James M. Beggs, Chairman of the Board, Spacehab, Inc., Washington, D.C.

Session Organizer: George H. Mosakowski, NASA, Kennedy Space Center, FL

**MEMBERS:**

LT. General Richard C. Henry, USAF, Retired

John Yardley

Bill Nelson

Frank Borman: Invited

**NOSTALGIA DISPLAY (7:30 a.m. to 12:30 p.m.)**

Howard Johnson Plaza-Hotel, Ballroom, North End

**SPACE CONGRESS GOLF TOURNAMENT**

(11:00 a.m. to 5:30 p.m.)

Patrick AFB Golf Course

Buffet Lunch: 11:00 a.m.

Shotgun Start: 12:30 p.m.

Map available at registration desk.

**PIONEERS' ANNUAL BANQUET**

Patrick AFB, Officers' Club

Social Hour: 6:30

Dinner: 7:30

Speaker: 8:30

Gilbert D. Rye

Senior Vice-President of Business Development

Orbital Sciences Corporation

# PROGRAM SUMMARY

## MONDAY, APRIL 26

**12:00 noon to 5:00 p.m.**

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

## TUESDAY, APRIL 27

**7:00 a.m. to 5:00 p.m.**

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

**8:30 a.m.**

KEYNOTE ADDRESS, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**9:00 a.m. to 11:30 a.m.**

PANEL SESSION I: SPACE RESEARCH AND DEVELOPMENT, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**9:00 a.m. to 5:00 p.m.**

SPACE VIDEOS, Howard Johnson Plaza-Hotel, Skylab Room

**11:00 a.m. to 7:00 p.m.**

YOUTH SCIENCE FAIR, Holiday Inn, Dolphin Room

**11:00 a.m. to 7:00 p.m.**

EXHIBITS, Cocoa Beach Hilton and Comfort Inn & Suite Resort

**12:00 noon to 1:30 p.m.**

LUNCHEON, Holiday Inn, Manatee Room

**2:00 p.m. to 5:00 p.m.**

PAPER SESSION I:

- A. ADVANCED TECHNOLOGY DEVELOPMENT, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. TODAY'S VISION (SEI, NLS, AEROSPACE PLANE), Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. INTERSTELLAR INITIATIVES, Holiday Inn, Manatee Room

**7:00 p.m.**

BANQUET SOCIAL HOUR, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**8:00 p.m.**

BANQUET, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

## WEDNESDAY, APRIL 28

**7:00 a.m. to 5:00 p.m.**

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

**8:30 a.m. to 11:30 a.m.**

PANEL SESSION II: SPACE OPERATIONS, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**9:00 a.m. to 5:00 p.m.**

SPACE VIDEOS, Howard Johnson Plaza-Hotel, Skylab Room

**11:00 a.m. to 8:00 p.m.**

EXHIBITS, Cocoa Beach Hilton and Comfort Inn & Suite Resort

**12:00 noon to 8:00 p.m.**

YOUTH SCIENCE FAIR, Holiday Inn, Dolphin Room

**12:00 noon to 1:30 p.m.**

LUNCHEON, Holiday Inn, Manatee Room

**2:00 p.m. to 5:00 p.m.**

PAPER SESSION II:

- A. CURRENT LAUNCH SYSTEMS, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. PAST AND FUTURE PAYLOADS, Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. COMMERCIAL SPACE DEVELOPMENT, Holiday Inn, Manatee Room

**6:00 p.m. to 7:30 p.m.**

EXHIBIT CENTER RECEPTION, Cocoa Beach Hilton and Comfort Inn & Suite Resort

## THURSDAY, APRIL 29

**7:00 a.m. to 5:00 p.m.**

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

**8:30 a.m. 11:30 a.m.**

PANEL SESSION III: SPACE STATION, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**9:00 a.m. to 1:00 p.m.**

YOUTH SCIENCE FAIR, Holiday Inn, Dolphin Room

**9:00 a.m. to 3:00 p.m.**

EXHIBITS, Cocoa Beach Hilton and Comfort Inn & Suite Resort

**9:00 a.m. to 5:00 p.m.**

SPACE VIDEOS, Howard Johnson Plaza-Hotel, Skylab Room

**1:00 p.m. to 4:00 p.m.**

PAPER SESSION III:

- A. SPACE STATION, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. SPACE EDUCATION, Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. 30 YEARS OF PROGRESS, SPINOFFS FROM SPACE TECHNOLOGY, Holiday Inn, Manatee Room

**6:00 p.m. to 8:00 p.m.**

SPACE CONGRESS RECEPTION, Holiday Inn, Observation Deck

**7:00 p.m. to 9:00 p.m.**

PANEL SESSION IV: MEET THE ASTRONAUTS, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

## FRIDAY, APRIL 30

**7:00 a.m. to 12:00 noon**

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

**8:30 a.m. to 11:30 a.m.**

PANEL SESSION V: YESTERDAY'S VISION IS TOMORROW'S REALITY, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

**11:00 a.m. to 5:30 p.m.**

SPACE CONGRESS GOLF TOURNAMENT, Patrick AFB, Golf Course

**6:30 p.m. to 10:00 p.m.**

PIONEERS' ANNUAL BANQUET, Patrick AFB, Officers' Club

## ACKNOWLEDGEMENTS

The Thirtieth Space Congress gratefully acknowledges the special support of the following organizations:

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City Officials of Cocoa Beach, to Mayor Bob Lawton and especially the Cocoa Beach Police Department

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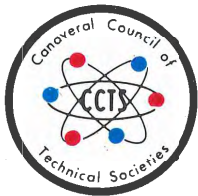
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