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## Space Congress Programs

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4-23-1991

# 1991 Twenty-Eighth Space Congress Program

Canaveral Council of Technical Societies

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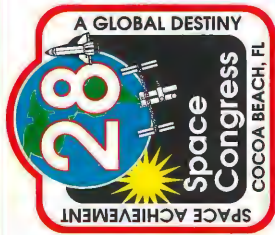
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**TWENTY-EIGHTH**



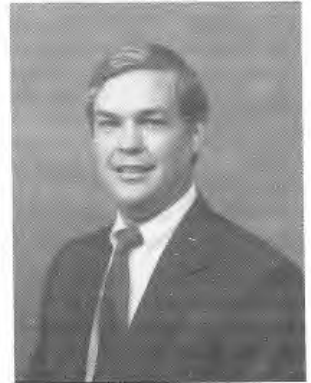
**SPACE CONGRESS**

**PROGRAM**

Cocoa Beach, Florida April 23, 24, 25, 26, 1991

## Chairman's Message

**"Space Achievement: A Global Destiny"** has been chosen as the theme of our **28th Annual Space Congress**. With the extraordinary international events of the past year, and with continued planning for cooperative space ventures, we feel that space accomplishments in the future will truly be a global enterprise. Once again, the Space Congress has attracted an outstanding group of leaders in the civilian and military space programs who will share their vision of the future for space achievement. The Space Congress will be bigger and better; including international participation, and a new additional exhibit area. Please join us in Cocoa Beach on **April 23-26, 1991**, for an exciting and interesting program.



The **28th Space Congress** is sponsored by the Canaveral Council of Technical Societies (CCTS) and supported by the National Aeronautics and Space Administration (NASA) and the Department of Defense (DoD). Extensive involvement of local aerospace contractors and the Space Coast communities have helped the Space Congress maintain its well-deserved reputation as the premier conference on space technology.

This year's panel sessions focus on current and future space exploration initiatives, the Space Station Freedom Program, DoD Operations and DoD Research and Development. Technical paper sessions will provide detailed information on such topics as Commercialization of Space, Interstellar Initiatives, Space Education, Science Payloads, Space Shuttle and Space Station. In addition, special briefing sessions using technical posters will be presented on international initiatives, by recognized space authorities throughout the congress.

We have a truly distinguished group of speakers for Space Congress this year. We will have Dr. Mark Albrecht as the keynote speaker. Other speakers include Arnie Aldrich, NASA Associate Administrator for Aeronautics and Space Technology; Brig. Gen. Jimmey Morrell, 9th Space Division Commander; Lt. Gen. Thomas S. Moorman, Commander Air Force Space Command; Dr. Lynn Weaver, President, Florida Institute of Technology; Lt. Gen. Don Cromer, Commander Space Systems Division; and Mr. Dick Kohrs, NASA Director for the Space Station Freedom Program. Lt. Gen. Forrest McCartney will introduce the "Meet the Astronauts" Panel. In addition, an outstanding group of leaders will be chairing the paper sessions.

On behalf of the committee, I invite you to join the **28th Space Congress** in April and I am looking forward to seeing you there.

*Bill McCaslin*

**Bill McCaslin  
General Chairman  
28th Space Congress**

## John W. Young NASA Astronaut

John W. Young was born September 24, 1930, in San Francisco, California.

He graduated from Orlando High School, Orlando, Florida and received a Bachelor of Science degree in Aeronautical Engineering with highest honors from the Georgia Institute of Technology in 1952.

Upon graduation from Georgia Tech, Young entered the United States Navy. After serving on the west coast destroyer U.S.S. Laws for a year, he was sent to flight training in props, jets and helicopters. He was then assigned to 'Flight Squadron 103' for four years, flying Cougar and Crusader aircraft.

After test pilot training at the U.S. Navy Test Pilot School in 1959, he was assigned to the Naval Air Test Center for three years. In 1962, he set world time-to-climb records to 3,000- and 25,000-meter altitudes.

Young was selected as an astronaut in 1962. His missions include:

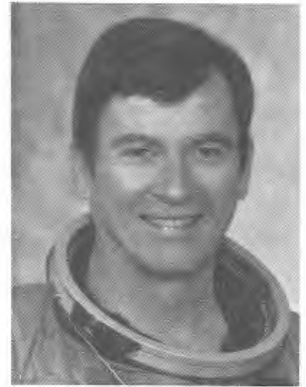
- Gemini 3, the first manned Gemini mission, where he operated the first computer on a manned spacecraft in 1965.
- He was commander of Gemini 10, which involved a dual rendezvous with two separate Agena target vehicles.
- He was command module pilot of Apollo 10, which orbited the moon and completed a lunar rendezvous in 1966.
- He was spacecraft commander of Apollo 16, a lunar exploration mission in 1972. Two hundred pounds of rocks were collected during this mission while on the moon.
- He was spacecraft commander of STS-1, the first flight of the Space Shuttle Columbia in 1981. Columbia was the first manned spaceship to be flown into orbit without the benefit of previous unmanned orbital testing. Columbia was also the first winged reentry vehicle to return from space to a runway landing.
- He was spacecraft commander of STS-9, the first Spacelab mission in 1983. This 10-day mission performed over 70 experiments, and returned more scientific and technical data than all previous Apollo and Skylab missions.

Young retired from the Navy as a Captain in 1976, after completing almost 25 years of active military service and logging more than 11,700 hours flying time, including 835 hours in six space flights. He is the first person to fly in space six times.

John Young has been awarded the Congressional Space Medal of Honor, three NASA Distinguished Service Medals, two Navy Distinguished Service Medals, and three Navy Distinguished Flying Crosses. He was also the recipient of more than 65 other major awards, including four honorary doctorate degrees, and was inducted into the National Aviation Hall of Fame in 1988.

He is married to the former Susy Feldman of St. Louis, Missouri. They have two children; Sandy, born April 30, 1957 and John, born January 17, 1959.

His recreational interests include wind surfing and bicycling.



# Information

## Headquarters/Registration

Headquarters for the **Twenty-Eighth Space Congress** is the Holiday Inn, Cocoa Beach. Registration will take place in the Dolphin Room from noon to 5:00 p.m. Monday, April 22, 1991. 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 .....	30.00

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 868-2147.

## Press Rooms

The press facility is located in the Skylab Room of the Howard Johnson Plaza-Hotel. The press facility is staffed and directed by Stuart Shadbolt and Chuck Morley 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), 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, or 0752.

## Proceedings

The proceedings of the **Twenty-Eighth 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 Cocoa Beach Hilton, Exhibit Hall, and the Cape Colony Resort Convention Center (formerly Travelodge) will be open to the public 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  
Allen-Bradley Company  
Aviation Week and Space Technology  
BAMSI, Inc.  
Bechtel National, Inc.  
BRPH  
Cexec, Inc.  
Compaq Computer Corporation  
Computer Sciences Raytheon  
Digital Equipment Corporation  
Eastman Kodak Company  
EG&G Florida, Inc.  
Final Frontier Magazine  
Florida Institute of Technology (Solar Car)  
General Dynamics Space Systems Division  
Government Technology Services, Inc.  
Grumman Corporation  
Harris Corporation  
Hercules Aerospace  
Hewlett Packard  
Honeywell, Inc. (Showcase Exhibit)  
Hughes Aircraft Corporation  
Hughes Danbury Optical Systems, Inc.  
International Business Machines Corporation  
Johnson Controls World Services Inc.  
Krieger Publishing Company, Inc.  
Lockheed Missiles and Space Company  
Lockheed Space Operations Company  
Loral Space Information Systems  
Martin Marietta Astronautics Group  
McDonnell Douglas Corporation  
Microsoft Corporation  
Motorola, Inc., Government Electronics Group  
NASA/Marshall Space Flight Center  
Planning Research Corporation  
Rocketdyne  
Rockwell International  
Silicone Graphics  
Teledyne Brown  
The Boeing Company  
Thiokol Corporation  
TRW, Inc.  
United Technology Corporation  
Vitro Corporation

## 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 24. 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 7:30 p.m. on Thursday, April 25.



## Pioneers' Day

The Pioneers' Day Banquet '91 will be held on Friday, April 26, at the Officers' Club, Patrick Air Force Base.

Social Hour: 6:30 p.m.  
Dinner: 7:30 p.m.  
Speaker: 8:30 p.m.  
J. R. Thompson  
Deputy Administrator, NASA, Washington, D.C.

Registration is April 23, 24 and 25 at the Dolphin Room, Holiday Inn, Cocoa Beach, and 5:30 to 6:30 p.m. at the Officers' Club on April 26.

## Space Congress Golf Tournament

Golfers will be able to enjoy a tournament at the Patrick AFB Course on Friday, April 26.

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 from your partner, and enclose \$30, 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 Institute of Industrial Engineers  
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  
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 of Logistics Engineers  
Society of Manufacturing Engineers  
Society of Photo-Optical Instrumentation Engineers  
Society for Technical Communication  
Society of Women Engineers

## Associate Members:

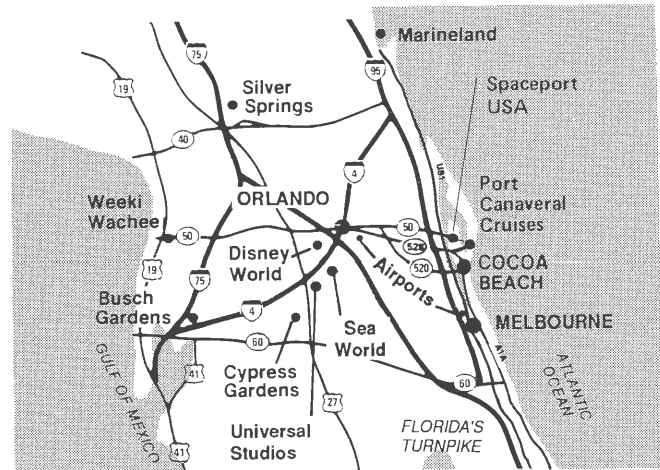
Association for Quality and Participation  
National Management Association, Florida Space Coast Council

Many of the societies will have educational/promotional brochures/ information on display at the CCTS Desk. 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. **Sea Escape** one day cruises, **Europa Star** part day cruises and 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 23**

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

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

Introductions: Bill McCaslin  
General Chairman  
Speaker: Dr. Mark J. Albrecht  
Executive Secretary, National Space Council

Dr. Mark J. Albrecht was appointed Executive Secretary of the National Space Council by President Bush on May 15, 1989.

Since 1982, Dr. Albrecht had served as the Legislative Assistant for National Security Affairs to United States Senator Pete Wilson of California. In this capacity, he was Senator Wilson's principal advisor on space and technology issues.

Dr. Albrecht has been a Senior Policy Analyst at Science Applications Internal Corporation (SAI) and Senior Research Analyst on the Resource Management Staff of the Director of Central Intelligence (DCI) in Washington, D.C.

In 1978 he was awarded a Ph.D. in Public Policy Analysis from the Rand graduate Institute at the Rand Corporation where he had been a research associate since 1972. His dissertation concentrated on labor substitution in a non-market environment.

Dr. Albrecht graduated Phi Beta Kappa from UCLA in 1971 with a degree in History. One year later, in 1972, Dr. Albrecht earned a Master's Degree at UCLA, again in History.

Dr. Albrecht and his wife Kathe were raised in San Diego, California. They currently live in Vienna, Virginia and have three children: Nicole, Alexander and Olivia.



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

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

## **SPACE EXPLORATION INITIATIVE**

Panel Chairman: Arnold D. Aldrich, Associate Administrator for Aeronautics, Exploration and Technology, NASA Headquarters, Washington, D.C.

Session Organizer: Dr. Terence T. Finn, Assistant Director, (Strategy) Space Exploration Directorate, NASA Headquarters, Washington, D.C.

### **MEMBERS:**

George W. S. Abbey, Deputy for Operations, Synthesis Group, Arlington, VA

Mark K. Craig, Special Assistant for Exploration, Office of Aeronautics, Exploration and Technology, NASA Headquarters

Dr. Michael B. Duke, Deputy for Science, Lunar and Mars Exploration Program Office, NASA, Johnson Space Center

Gregory M. Reck, Director for Space Technology, Office of Aeronautics, Exploration and Technology, NASA Headquarters

Barney B. Roberts, Director, Planetary Surface Systems Office, Lunar and Mars Exploration Program Office, NASA, Johnson Space Center

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

**Holiday Inn, Manatee Rooms A and B**

Introductions: Bill McCaslin  
General Chairman  
Speaker: Brig. Gen. Jimmy R. Morrell  
Commander, 9th Space Division, Patrick AFB, FL

Brigadier General Jimmy R. Morrell is commander of the 9th Space Division at Patrick Air Force Base, Florida

General Morrell was born June 4, 1946, in Morgan City, Louisiana. He earned a Bachelor of Science degree from Nicholls State University in Thibodaux, Louisiana, in 1968 and a Master of Arts degree in economics from the University of South Dakota in 1975. He is also a distinguished graduate of Squadron Officer School in 1972, Air Command and Staff College in 1977, and the Industrial College of the Armed Forces in 1985.



General Morrell entered the Air Force in 1968 as a distinguished graduate of the Reserve Officer Training Corps and was initially assigned to Lowry Air Force Base, Colorado, where he completed Air Intelligence Officers' School in 1969. He was then assigned to the 3rd Tactical Fighter Wing, Bien Hoa, Republic of Vietnam, as a wing intelligence officer, where he flew more than 100 combat hours in various fighter aircraft.

From 1970 through 1987, General Morrell's assignments included tours at Strategic Air Command Headquarters, the 44th Strategic Missile Wing, Air University and the Pentagon.

In July 1987, General Morrell was selected by the Secretary of the Air Force to be his military assistant for space, where he served as the advisor to the secretary on all technical, programmatic and operational issues affecting national security space programs. General Morrell assumed command of the 2nd Space Wing at Falcon Air Force Base, Colorado, in December 1988.

General Morrell wears the Master Space Badge and the Senior Missile Operations Badge. His military decorations and awards include the Defense Superior Service Medal, the Legion of Merit, the Bronze Star, Defense Meritorious Service Medal with one oak leaf cluster, Meritorious Service Medal with three oak leaf clusters, Air Force Commendation Medal, Vietnam Service Medal, Air Force Achievement Medal, Combat Readiness Medal, Republic of Vietnam Gallantry Cross with Palm and the Republic of Vietnam Campaign Medal.

General Morrell is married to the former Marjorie Ann McCracken of Sioux City, Iowa. They have three children: Ryan, Kyle and Kelly.

## POSTER SESSION

### Holiday Inn, Mezzanine

(New this year. Posters are displayed throughout the Congress.)

#### U.S. AND INTERNATIONAL INITIATIVES IN ENVIRONMENTAL AND GLOBAL MONITORING, SATELLITE COMMUNICATIONS AND OTHER RELATED TOPICS

Session Chairman: Stephen L. Morgan, Director, Space Industry Development, Virginia's Center for Innovative Technology, Herndon, VA

Session Organizer: Robert Mellor, Lockheed Space Operations Company, Kennedy Space Center, FL

The posters are displayed throughout the entire Congress. Authors set times during which they will be present at the poster to discuss the subject of the poster. These times will be scheduled such as not to overlap other scheduled Space Congress activities.

#### POSTERS:

- 1. VIRGINIA TECH'S NEW CENTER FOR COMMERCIAL SATELLITE COMMUNICATIONS**  
Dr. Charles Bostian, Executive Director, Center for Commercial Satellite Communications, Virginia Polytechnic Institute and State University, Blacksburg, VA
- 2. AN OVERVIEW OF THE COMMERCIAL SPACE ARCHIVES**  
PolyAnna Bryant, Acting Curator, Commercial Space Archives, Herndon, VA
- 3. LAUNCHSITE OPERATIONS COMPARISON BETWEEN EARTH, THE MOON AND MARS**  
Suzanne Hodge, Rockwell International Corporation, Cape Canaveral, FL  
Ron Caldwell, Rockwell International Corporation, Downey, CA
- 4. SPACE-RELATED R&D ACTIVITIES OF FLORIDA'S TRDA**  
Frank Kinney, Executive Director, Technological R&D Authority, Melbourne, FL
- 5. AN INDUSTRY REVIEW INITIATIVE IN SUPPORT OF THE COMMERCIAL REMOTE SENSING INDUSTRY**  
Jeffrey Manber, Executive Director, The Space Foundation, Washington, D.C.
- 6. COMMERCIAL DEVELOPMENT OF INTERNATIONAL SATELLITE COMMUNICATIONS**  
Dr. Barbara Stone, Director, Plans, Policy and Evaluation, NASA Office of Commercial Programs, Washington, D.C.
- 7. ACTIVITIES AND INITIATIVES OF THE NAVAL SPACE COMMAND**  
Gary Wagner, Public Relations Officer, Naval Space Command, Dahlgren, VA
- 8. LAWS — LASER ATMOSPHERIC WIND SOUNDER**  
David Wilson, Lockheed Missiles and Space Company, Huntsville, AL

- 9. EUROPEAN REMOTE SENSING SATELLITE — ERS-1/ERS-2**  
Gervino Walter, Marketing Manager, Orbiting Systems, Dornier, Friedrichshafen, Germany

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

##### A. INTERSTELLAR INITIATIVES

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

Session Chairman: Dr. Steven Hawley, Associate Director, NASA, Ames Research Center, Moffett Field, CA

Session Organizer: Dr. Allan Drysdale, Specialist for New Technical Applications, McDonnell Douglas Space Systems Company, Kennedy Space Center, FL

- 1. SESSION CHAIRMAN'S ADDRESS — INTERSTELLAR INITIATIVES: A CURRENT STATUS**  
Dr. Steven Hawley, Associate Director, NASA, Ames Research Center, Moffett Field, CA
- 2. INTERSTELLAR INITIATIVES**  
Dr. Allan Drysdale, McDonnell Douglas Space Systems Company, Kennedy Space Center, FL  
Jerome H. Vick, NASA, Kennedy Space Center, FL
- 3. AN INTERSTELLAR EXPLORATION INITIATIVE FOR FUTURE FLIGHT**  
H. D. Froning, McDonnell Douglas Space Systems Company, Huntington Beach, CA
- 4. HUMAN FACTORS ISSUES FOR INTERSTELLAR SPACECRAFT**  
Marc Cohen, NASA, Ames Research Center, Moffett Field, CA  
Adam R. Brody, Sterling Software, Moffett Field, CA
- 5. MAGNETIC SHIELDING FOR INTERPLANETARY SPACECRAFT**  
J. Stephen Herring, Idaho National Engineering Laboratory  
Brad J. Merrill, Idaho National Engineering Laboratory
- 6. THE CHARACTERISTICS OF EXTRATERRESTRIAL CIVILIZATIONS AND THE INTERSTELLAR IMPERATIVE**  
Dr. Joseph A. Angelo, Jr., Director, Science Applications International Corporation, Melbourne, FL

##### B. SPACE EXPLORATION INITIATIVES

###### Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: George Abbey, Deputy for Operations, Synthesis Group, Arlington, VA

Session Organizer: Suzanne Hodge, Rockwell International Corporation, Cape Canaveral, FL

- 1. LAUNCH SITE COMPARISON BETWEEN THE EARTH, THE MOON AND MARS**  
Suzanne Hodge, Rockwell International Corporation, Cape Canaveral, FL  
Ron Caldwell, Rockwell International Corporation, Downey, CA



2. NUCLEAR THERMAL ROCKET PROPULSION APPLICATION TO MARS MISSIONS

W. J. Emrich, Jr., Marshall Space Flight Center, Huntsville, AL  
A. C. Young, Marshall Space Flight Center, Huntsville, AL  
J. A. Mulqueen, Marshall Space Flight Center, Huntsville, AL

3. AUTONOMOUS ROBOTIC SYSTEMS FOR SEI TASKS

Davoud Manouchehri, Rockwell International Corporation, Downey, CA  
C. M. Wu, Rockwell International Corporation, Downey, CA  
Margaret M. Clarke, Rockwell International Corporation, Downey, CA  
A. J. Mauceri, Rockwell International Corporation, Downey, CA

4. THE SPACE EXPLORATION INITIATIVE AND THE AERO-SPACE PLANE LAUNCHER

Russel J. Hannigan, Visiting Researcher, Space and Hypersonics, CREST Ecole Polytechnique, Paris, France  
Dr. David C. Webb, President, International Hypersonic Research Institute, Winter Springs, FL

5. MAXIMIZATION OF BENEFITS FROM THE SPACE EXPLORATION INITIATIVE

Dr. W. H. Siegfried, Program Manager Exploration, Space Exploration Initiative, McDonnell Douglas Space Systems Company  
Dr. J. W. Alred, Director of Space, Eagle Engineering, Inc.

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

Session Chairman: Edward A. O'Connor, Jr., Director, Spaceport Florida Authority, Cocoa Beach, FL

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

1. THE INTERNATIONAL THREAT TO U.S. COMMERCIAL LAUNCH SERVICES

Lee R. Scherer, General Dynamics Commercial Launch Services, San Diego, CA

2. THE ROLE OF THE UNIVERSITY IN COMMERCIAL LAUNCH ACTIVITIES

Dr. Gerard G. Ventre, UCF Space Education and Research Center, Orlando, FL  
Dr. James Ragusa, UCF Space Education and Research Center, Orlando, FL

3. DELTA II (MODEL 7925) DEVELOPMENT AND FLIGHT RESULTS

Sam K. Mihara, McDonnell Douglas Space Systems Company, Huntington Beach, CA

4. SPACEHAB, A COMMERCIAL APPROACH TO SPACE

Dino Brondolo, ALENIA, Alenia Spazio, Torino, Italy

5. COMMERCIAL SPACE INFRASTRUCTURE: GIVING INDUSTRY A LIFT

Dr. Barbara A. Stone, Office of Commercial Programs, NASA Headquarters, Washington, D.C.  
Peter W. Wood, Space Consultant, Alexandria, VA

6. TOWARD THE OFF-THE-SHELF LAUNCH

Chuck Molyneaux, Silicon Graphics Computer Systems, Maitland, FL

7. THE COMET PROGRAM — A PROGRESS REPORT

Joseph Pawlick, Center for Advanced Space Propulsion, Tullahoma, TN

8. COMMERCIAL INFRASTRUCTURE PARTICIPATION IN THE SPACE STATION FREEDOM PROGRAM

Kevin Barquinero, Space Station Engineering Division, NASA Headquarters, Washington, D.C.  
Alison Watkins, Consultant, The Egan Group

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: Bill McCaslin  
General Chairman  
Speaker: To Be Announced



## WEDNESDAY, APRIL 24

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

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

#### DoD SPACE OPERATIONS

Panel Chairman: Lt. Gen. Thomas S. Moorman, Jr., USAF,  
Commander, Air Force Space Command, Peterson AFB, CO

Session Organizer: Capt. William E. Richard, USAF, Eastern Test  
Range Navy Ballistic Program Manager, Patrick AFB, FL

#### MEMBERS:

Brig. Gen. Dale E. Stovall, USAF, Vice Commander, Air Force Special  
Operations Command

Col. Robert S. Dickman, USAF, Deputy Director, Space and Strategic  
Defense Initiative, Headquarters, U.S. Air Force

Col. William S. Hinton, Jr., USAF, Commander, 58th Tactical Training  
Wing

TBD, Army Space Command

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

Holiday Inn, Manatee Rooms A and B

Introductions: Bill McCaslin  
General Chairman

Speaker: Dr. Lynn E. Weaver  
President, Florida Institute of Technology,  
Melbourne, FL

Dr. Weaver has thirty years of academic and administrative experience, serving on the faculty of five major universities. He has held every academic rank and currently is President of Florida Institute of Technology.

He has served in academic administration for the past twenty-five years in the positions of Department Head, University of Arizona; Associate Dean, University of Oklahoma; School Director, Georgia Institute of Technology; Distinguished Professor and Dean, Auburn University.

He has been active in research, receiving major research funding from industry and government; is the author of two textbooks; the editor or co-editor of five technical books and over fifty publications in professional journals and is Executive Editor of the technical journal, *Annals of Nuclear Energy*. Two of his speeches on energy were selected for reprint in *Vital Speeches of the Day* and read into the Congressional Record.

He has held offices in a number of national professional organizations and is a Fellow of the American Nuclear Society. Dr. Weaver has served on advisory committees to government and industry and, on several occasions, given expert testimony to congressional committees.

He is a consultant to a number of industrial organizations, legal firms, the Texas Higher Education Coordinating Board, and has consulted with the



Organization of American States in education and research development in Latin America. He has served on State commissions and the Board of Directors of Oak Ridge Associated Universities, the National Center for Asphalt Technology, several civic organizations and currently is on the Board of Directors of DBA Systems, Inc.

Dr. Weaver has provided a leadership role in the development and restructuring of academic and research programs, introduction of innovation in education, raising outside support for buildings, equipment, endowed chairs, scholarships and faculty development. He recently initiated a major development campaign for the Florida Institute of Technology.

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

#### A. SCIENCE PAYLOADS

Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairman: Dr. John M. Klineberg, Director, Goddard  
Space Flight Center, Greenbelt, MD

Session Organizer: Lee O'Fallon, Space Station Project Office,  
NASA, Kennedy Space Center, FL

#### 1. TETHERED SATELLITES: EXOTIC AND POWERFUL PROBES FOR SCIENTIFIC EXPERIMENTS IN LOW PLANETARY ORBITS

Bruno Strim, ALENIA, Alenia Spazio, Torino, Italy  
Francis Giani, ALENIA, Alenia Spazio, Torino, Italy

#### 2. IRISS — LAGEOS 2 MISSION

Roberto Ibba, Italian Space Agency, Rome, Italy  
Giovanni Rum, Italian Space Agency, Rome, Italy  
Franco Varesio, Italian Space Agency, Rome, Italy  
Enrico Beruto, Italian Space Agency, Rome, Italy  
Pratzia Buratti, Italian Space Agency, Rome, Italy

#### 3. GAMMA RAY OBSERVATORY: VIEWING THE VIOLENT UNIVERSE

David J. Thompson, NASA, Goddard Space Flight Center, Greenbelt, MD  
D. A. Kniffen, NASA, Goddard Space Flight Center, Greenbelt, MD

#### 4. MAGELLAN: GEOLOGIC MAPPING OF VENUS

Steven Saunders, NASA, Jet Propulsion Laboratory, Pasadena, CA  
Ellen Stofan, NASA, Jet Propulsion Laboratory, Pasadena, CA

#### 5. THE CENTRIFUGE SUITE — ENABLING LIFE SCIENCES RESEARCH ON SPACE STATION FREEDOM

C. E. Rudiger, Jr., Manager, Centrifuge Facility Project, Lockheed  
Missiles and Space Company, Inc.

#### B. SPACE SHUTTLE AND DERIVATIVES

Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: Brewster H. Shaw, Deputy Director, Space  
Shuttle Operations, NASA Headquarters (stationed at Kennedy  
Space Center, FL)

Session Organizer: Patricia Houston, Manager, Project Integra-  
tion, McDonnell Douglas Space Systems Company, Kennedy Space  
Center, FL

1. **THE LAUNCH PROCESSING SYSTEM OF TOMORROW**  
Gerry Duggan, Harris Space Systems Corporation, Rockledge, FL  
Shaman Mullick, Harris Space Systems Corporation, Rockledge, FL  
Charles Westerfield, Harris Space Systems Corporation, Rockledge, FL
2. **SIMULATING SHUTTLE AND DERIVATIVE VEHICLE PROCESSING AT KENNEDY SPACE CENTER**  
Mark Heileman, P.E., Space Systems Division, Rockwell International, Florida Operations  
John Winkler, Space Systems Division, Rockwell International, Florida Operations  
Dr. Darrell Linton, P.E., Department of Computer Engineering, University of Central Florida, Orlando, FL  
Dr. Soheil Khajenoori, Department of Computer Engineering, University of Central Florida, Orlando, FL  
Dr. Gregory L. Heileman, Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM
3. **SPACE SHUTTLE PROCESSING: A CASE STUDY IN ARTIFICIAL INTELLIGENCE**  
Cindy Mollakarimi, Lockheed Space Operations Company, Titusville, FL  
Monte Zweben, NASA, Ames Research Center, Moffett Field, CA  
Bob Gargan, Lockheed Corporation, Palo Alto, CA
4. **AN APPROACH TO SHUTTLE EVOLUTION**  
Richard Thiel, Rockwell International Corporation, Space Systems Division, Downey, CA  
Ardell Nease, Rockwell International Corporation, Space Systems Division, Downey, CA  
Kim Smith, Rockwell International Corporation, Space Systems Division, Downey, CA
5. **LAUNCH SITE PROCESSING OF THE PERSONNEL LAUNCH SYSTEM**  
Gary Letchworth, Senior Engineer, Lockheed Space Operations Company, Titusville, FL
6. **NASA'S HEAVY-LIFT CARGO LAUNCH VEHICLE NEEDS AND OPTIONS FOR THE POST 2000 PERIOD**  
Uwe Hueter, NASA, Marshall Space Flight Center, Huntsville, AL  
Hugh Brady, NASA, Marshall Space Flight Center, Huntsville, AL  
Mr. Ray Evans, NASA, Kennedy Space Center, FL

**C. DoD SPACE OPERATIONS**  
**Holiday Inn, Manatee Rooms A and B**

Session Chairman: Col. John S. Boone, Director of Space Operations, Headquarters, Air Force Space Command, Peterson AFB, CO

Session Organizer: Capt. William E. Richard, USAF, Eastern Test Range, Navy Ballistic Program Manager, Patrick AFB, FL

1. **ASSURED ACCESS TO AND USE OF SPACE: A MILITARY PERSPECTIVE**  
Col. Henry G. Culbertson, III, USAF, Deputy Director for Space Control, U.S. Space Command, Cheyenne Mountain AFB, CO  
Maj. Michael K. Weiderhold, U.S. Army, Astronautical Engineer, U.S. Space Command, Cheyenne Mountain AFB, CO
2. **OPERATIONAL SPACE SUPPORT TO TACTICAL FORCES**  
Lt. Col. Owen E. Jensen, USAF, Chief, Space Forces Division, Programs and Requirements, Headquarters, U.S. Air Force
3. **USAF ENGINEERING AND SERVICES ROLES IN SPACE OPERATIONS: BUILDING THE FOUNDATION FOR OUR FUTURE SPACE INFRASTRUCTURE**  
Capt. R. John Martin, USAF, Engineering and Services Space Plans Office, Headquarters, Air Force Space Command, Peterson AFB, CO
4. **DAILY OPERATIONS SUPPORTING THE GLOBAL POSITIONING SYSTEM (GPS)**  
Lt. Kyle G. Roesler, USAF, Second Satellite Control Squadron, Second Space Wing, Falcon AFB, Colorado Springs, CO
5. **ASTRO: A COMPUTER-AIDED SCHEDULING TOOL FOR OPERATIONAL SATELLITE CONTROL**  
Capt. Cameron H. G. Wright, USAF, Space Systems Division, Los Angeles AFB, CA  
Capt. Donald J. Aitken, USAF, Space Systems Division, Los Angeles AFB, CA
6. **THE EVOLUTION OF SPACE TRAINING**  
Maj. Dana Atkins, USAF, 1022nd Combat Crew Training Squadron, Air Force Space Command, Peterson AFB, CO

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**EXHIBIT CENTER COCKTAIL RECEPTION (6:00 p.m. to 7:30 p.m.)**  
**Cocoa Beach Hilton, Exhibit Hall and Cape Colony Resort Convention Center (formerly Travelodge)**



## THURSDAY, APRIL 25

### PANEL SESSION III (8:30 a.m. to 11:30 a.m.)

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

#### DoD RESEARCH AND DEVELOPMENT

Panel Chairman: Lt. Gen. Donald L. Cromer, USAF, Commander, Space Systems Division, Air Force Systems Command, Los Angeles AFB, CA

Session Organizer: Capt. Spencer H. Levels, USAF, Eastern Test Range Space Shuttle Program Manager, Patrick AFB, FL

#### MEMBERS:

Edward C. "Pete" Aldridge, President, McDonnell Douglas Electronic Systems Company

Dr. Allan C. Schell, Chief Scientist, Headquarters, Air Force Systems Command

Col. Brent R. Collins, USAF, Deputy Chief for Staff Developmental Planning, Space Systems Division, Air Force Systems Command

T. Jack Lee, Center Director, NASA, Marshall Space Flight Center

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

#### A. SPACE EDUCATION

Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairman: Barbara Morgan, NASA's "Teacher in Space" Designee, NASA, Education Affairs Office, NASA Headquarters, Washington, D.C.

Session Organizer: Dr. Gerard Ventre, Acting Director, Space Education and Research Center, University of Central Florida, Orlando, FL

##### 1. THE CRISIS IN HUMAN CAPITAL

E. D. Kam Kersey, NASA, Kennedy Space Center, FL  
Judith A. Kersey, NASA, Kennedy Space Center, FL

##### 2. WORKFORCE 2000 AND ITS EDUCATION IMPLICATIONS FOR SPACE ORGANIZATIONS

Betty P. Preece, Science Education Consultant, Indialantic, FL

##### 3. EXCELLENCE IN EDUCATION THROUGH SPACE EXPLORATION

Lisa G. Bartosik, Staff Manager, Program Development — NASA Space Flight Centers, McDonnell Douglas Space Systems Company, Huntington Beach, CA

##### 4. CHALLENGER CENTER TOUCHING THE FUTURE

Richard A. Methia, Challenger Center for Space Science Education

##### 5. THE FLORIDA SPACE GRANT CONSORTIUM

Dr. Martin A. Eisenberg, Department of Aerospace Engineering, Mechanics and Engineering Science, University of Florida, Gainesville, FL

##### 6. THE ROLE OF SIMULATION IN SPACE OPERATIONS TRAINING

Maj. Frank Ocasio, USAF, Air Force Space Command, Peterson AFB, CO

Maj. Dana Atkins, USAF, Air Force Space Command, Peterson AFB, CO

#### B. SPACE STATION

Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: Dr. John Cox, Acting Deputy Director for Operations, Space Station Freedom Program and Operations Office, NASA, Space Station, Freedom Program, Reston, VA

Session Organizer: Ann Delo, NASA, Space Station Freedom Project, Reston, VA

##### 1. THE COLUMBUS ATTACHED LABORATORY

Luigi D'Emiliano, Manager, Attached Laboratory Project, ALENIA, Alenia Spazio, Torino, Italy

##### 2. SPACE STATION ON-ORBIT ASSEMBLY AND OPERATION

L. P. Morata, Vice President — Deputy General Manager, McDonnell Douglas Space Systems Company, Huntington Beach, CA

##### 3. COLUMBUSFREE-FLYERCENTER—TASKSANDMANPOWER PROFILE

H. J. C. Koopman, Manager, Columbus Operations Support, MBB-ERNO, Raumfahrttechnik, Germany

##### 4. ASSURED CREW RETURN

Charles E. Daniher, Chief Project Engineer, Rockwell International, Downey, CA

##### 5. UTILIZATION OF COMMON PRESSURIZED MODULES OF SPACE STATION FREEDOM

Daniel D. Mazanek, Staff Engineer, Analytical Mechanics Associates, Inc., Langley Research Center, Hampton, VA

Michael L. Heck, Ph.D., Staff Engineer, Analytical Mechanics Associates, Inc., Langley Research Center, Hampton, VA

Marston J. Gould, NASA Space Station Freedom Office, Langley Research Center, Hampton, VA

##### 6. A ROBOT BASED CONCEPT FOR AUTOMATION AND SERVICING OF SCIENTIFIC PAYLOADS ABOARD ORBITING LABORATORIES

Jorg Flemmig, Dornier, Friedrichshafen, Germany

Peter Putz, Dornier, Friedrichshafen, Germany

#### C. DoD RESEARCH AND DEVELOPMENT

Holiday Inn, Manatee Rooms A and B

Session Chairman: Col. Michael R. Spence, USAF, Commander, 6555th Aerospace Test Group, Cape Canaveral Air Force Station, FL



Session Organizer: Capt. Spencer H. Levels, USAF, Space Shuttle Program Manager, Eastern Test Range, Patrick AFB, FL

1. A SUMMARY OF BENEFITS FROM THE DoD SPACE TEST PROGRAM

Thomas Hagler, ANSER, Arlington, VA

2. ACCELERATED LOW COST LIQUID ENGINE STAGE DEVELOPMENT FOR CRITICAL NEED MISSIONS

David Barnhart, Astronautics Laboratory, Edwards AFB, CA  
Mark Coleman, Astronautics Laboratory, Edwards AFB, CA  
Bill Mabe, NASA, Jet Propulsion Laboratory, Pasadena, CA  
George Goranson, NASA, Jet Propulsion Laboratory, Pasadena, CA

3. GROUND BASED LASER SYSTEM—DEFENSE AT THE SPEED OF LIGHT

Lt. Donald J. Fielden, USAF, Directed Energy Weapons Program Office, Space Systems Division, Los Angeles AFB, CA

4. HISTORY OF THE SPACE BASED LASER (SBL) CONCEPT DEFINITION

Lt. Debora E. Mosley, USAF, Directed Energy Weapons Program Office, Space Systems Division, Los Angeles AFB, CA  
Capt. Alvaro Gracia, USAF, Directed Energy Weapons Program Office, Space Systems Division, Los Angeles AFB, CA

**SPACE CONGRESS RECEPTION (6:00 p.m. to 8:00 p.m.)**  
**Holiday Inn, Observation Deck**

**PANEL SESSION IV (7:30 p.m. to 9:30 p.m.)**  
**Howard Johnson Plaza-Hotel, Mercury-Gemini Room**

**MEET THE ASTRONAUTS**

Panel Chairman: Lt. Gen. Forrest S. McCartney, USAF Retired, Center Director, NASA, Kennedy Space Center, FL

Astronauts: As available between training commitments.

**FRIDAY, APRIL 26**

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

**SPACE STATION**

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

Session Organizer: Dr. Earle K. Huckins, Director, Space Station Engineering, NASA Headquarters, Washington, D.C.

**MEMBERS:**

Robert Moorehead, Deputy Director, Space Station Freedom Program and Operations, NASA, Reston, VA

George D. Hopson, Manager, Space Station Projects Office, NASA, Marshall Space Flight Center

John W. Aaron, Manager, Space Station Projects Office, NASA, Johnson Space Center

Ronald L. Thomas, Director, Space Station Freedom, NASA, Lewis Research Center

J. R. (Dick) Lyon, Manager, Space Station Project Office, NASA, Kennedy

**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

J. R. Thompson, Deputy Administrator, NASA, Washington, D.C.

# PROGRAM SUMMARY

## MONDAY, APRIL 22

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

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

## TUESDAY, APRIL 23

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

**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, Exhibit Hall and Cape Colony Resort Convention Center

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

LUNCHEON, Holiday Inn, Manatee Rooms A and B

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

PAPER SESSION I:

- A. INTERSTELLAR INITIATIVES, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. SPACE EXPLORATION INITIATIVES, Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. COMMERCIAL SPACE DEVELOPMENT, Holiday Inn, Manatee Rooms A and B

**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 24

**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: DoD SPACE OPERATIONS, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

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

EXHIBITS, Cocoa Beach Hilton, Exhibit Hall and Cape Colony Resort Convention Center

**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 Rooms A and B

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

PAPER SESSION II:

- A. SCIENCE PAYLOADS, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. SPACE SHUTTLE, Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. DoD SPACE OPERATIONS, Holiday Inn, Manatee Rooms A and B

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

EXHIBIT CENTER COCKTAIL RECEPTION, Cocoa Beach Hilton, Exhibit Hall and Cape Colony Resort Convention Center

## THURSDAY, APRIL 25

**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: DoD RESEARCH AND DEVELOPMENT, 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, Exhibit Hall and Cape Colony Resort Convention Center

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

PAPER SESSION III:

- A. SPACE EDUCATION, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. SPACE STATION, Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. DoD RESEARCH AND DEVELOPMENT, Holiday Inn, Manatee Rooms A and B

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

SPACE CONGRESS RECEPTION, Holiday Inn, Observation Deck

**7:30 p.m. to 9:30 p.m.**

PANEL SESSION IV: MEET THE ASTRONAUTS, Howard Johnson Plaza-Hotel, Mercury-Gemini Room

## FRIDAY, APRIL 26

**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: SPACE STATION, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

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

SPACE CONGRESS GOLF TOURNAMENT, Patrick AFB, Golf Course

**6:30 p.m. to 9:30 p.m.**

PIONEERS' ANNUAL BANQUET, Patrick AFB, Officers' Club

## ACKNOWLEDGEMENTS

The **Twenty-Eighth 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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