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## Space Congress Programs

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4-24-1990

# 1990 Twenty-Seventh Space Congress Program

Canaveral Council of Technical Societies

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**TWENTY-SEVENTH**



**SPACE CONGRESS**

**PROGRAM**

Cocoa Beach, Florida April 24, 25, 26, 27, 1990

## Chairman's Message

The "90's - Decade of Opportunity" has been chosen as the theme of our 27th annual Space Congress, and symbolizes the exciting programs in store for us this year. With the 80's culminating in our nation's successful return to space, this decade is signified by a renewed enthusiasm to further explore the universe.



The 27th Space 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 (DoD). Extensive involvement of local aerospace contractors and the Space Coast communities has helped the Space Congress maintain its well-deserved reputation as the premier conference on space technology.

This year's panel sessions focus on the upcoming opportunities in space, and provide additional insight into DoD Space Programs and Operations, derivatives of the Space Transportation System, and Space Station activities. Panel Chairmen include outstanding leaders Robert L. Crippen, Richard H. Kohrs, Lt. Gen Donald L. Cromer and Lt. Gen Thomas S. Moorman, Jr. Technical paper sessions will provide detailed information on such topics as Space Education, Commercial Initiatives, Technology Payloads and Robotics.

Scheduled speakers include Congressman Bill Nelson who will open the four-day session, Admiral Richard H. Truly, NASA Administrator, who will speak at the Tuesday evening banquet and Mr. Sanford N. McDonnell, Chairman Emeritus of McDonnell Douglas, who will address the guests at the Tuesday luncheon. "Teacher in Space" designee Barbara Morgan will speak at the Wednesday luncheon and General Forrest McCartney, Kennedy Space Center Director, will introduce the Meet the Astronauts Panel.

We hope you will find this week's program challenging and informative. If the committee members or I can do anything to make your visit more enjoyable, please let us know.

*Doug Sargent*

**Doug Sargent  
General Chairman  
27th Space Congress**

## General Information

### Headquarters/Registration

Headquarters for the Twenty-Seventh 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 23, 1990. 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

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

Press facilities are located in the Egret Room of the Holiday Inn of Cocoa Beach and the Skylab Room of the Howard Johnson Plaza-Hotel. Press facilities are staffed and directed by Stuart Shadbolt and John Glass 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 numbers for the press facilities are: Holiday Inn (407) 868-2329, 2341, or 2343 and Howard Johnson Plaza-Hotel 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-Seventh 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, computergraphics demonstrations and displays of the Space Station, Space Shuttle, Shuttle payloads, expendable launch vehicles, and other space related activities. The Exhibit Hall and Exhibit Rooms will be open from 11:00 a.m. to 7:00 p.m. Tuesday, from 11:00 a.m. to 8:00 p.m. on Wednesday, and from 9:00

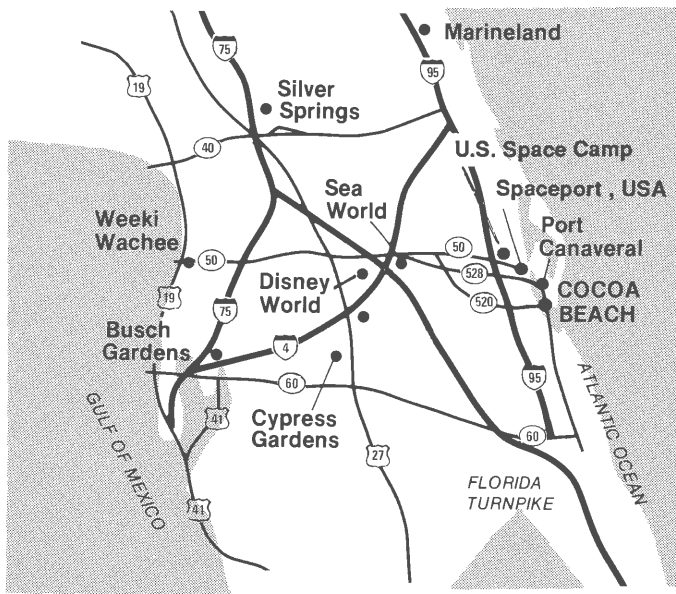
a.m. to 3:00 p.m. on Thursday. Representatives of the exhibitors will be in attendance to assist and inform visitors. The Exhibit Hall and Exhibit Rooms are located in the Cocoa Beach Hilton, 1550 N. Atlantic Ave. (A1A), Cocoa Beach.

### Exhibitors

Allen-Bradley Company  
Aviation Week and Space Technology  
BAMSI  
Bechtel National, Inc.  
Boeing Aerospace Operations, Inc.  
Brevard Community College  
Bruce G. Jackson & Associates  
Canaveral Council of Technical Societies  
Computer Sciences Raytheon  
Diversified Information Systems, Inc.  
EG&G Florida, Inc.  
Embry-Riddle Aeronautical University  
Final Frontier Magazine  
Florida Institute of Technology  
General Dynamics Corporation  
Government Technology Services, Inc.  
Harris Corporation  
Hercules Aerospace  
Honeywell  
Hughes Danbury Optical Systems, Inc.  
International Business Machines Corporation  
Krieger Publishing Company  
Lockheed Missiles and Space Company  
Martin Marietta Corporation  
McDonnell Douglas Space Systems Corporation  
Morton Thiokol  
Pan Am World Services, Inc.  
Perkin-Elmer Corporation  
Planning Research Corporation  
Rocketdyne  
Rockwell International  
Space Systems Services, Inc.  
TRW, Inc.  
United States Air Force  
United States Naval Research Laboratory  
United Technologies Corporation  
University of Central Florida  
Utah Economic Development  
Vitro, Inc.

### 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 25. 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 26.



## 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** or the **SS Carnivale** 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** — **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** — and the beautiful gardens and daily water ski revue with lovely aquamaids at **Cypress Gardens**.

## Pioneers' Day

The Pioneers' Day Banquet '90 will be held on Friday, April 27, at the Officer's Club, Patrick Air Force Base.

Social Hour: 6:30 p.m.  
 Dinner: 7:30 p.m.  
 Speaker: 8:30 p.m.  
 James C. Adamson, Astronaut,  
 Colonel, U.S. Army

Registration is April 24, 25 and 26 at the Dolphin Room, Holiday Inn, Cocoa Beach, and 5:30 to 6:30 p.m. at the Officer's Club on April 27.

## Canaveral Council of Technical Societies

### CCTS Member Societies:

Air Force Association  
 American Institute of Architects

American Institute of Aeronautics & Astronautics  
 American Institute of Industrial Engineers  
 American Meteorological Society  
 American Society of Civil Engineers  
 American Society of Heating, Refrig. & 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 for Safety Engineers  
 American Society for Training and Development  
 American Welding Society  
 Armed Forces Communication Electronics Association  
 East Central Florida Space Business Roundtable  
 Florida Engineering Society  
 Institute of Electrical & Electronic Engineers  
 Instrument Society of America  
 Missile, Space & Range Pioneers, Inc.  
 National Contract Management Association  
 National Space Club-Florida Committee  
 National Technical Association  
 Society for the Advancement of Materials & 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.

## Space Congress Golf Tournament

Golfers will be able to enjoy a tournament at the Patrick Air Force Base Course on Friday, April 27.

The tournament will be a four player, select shot format, as in the past. You may sign up with up to three partners 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(s), and enclose \$25, each person. A maximum of 140 players will be registered on a first come, first in basis. Buffet lunch, refreshments on the course, green fees, carts, and trophies are included in the fee. Lunch at 11:30 a.m., and shotgun start at 1:00 p.m. will allow completion in time for Pioneers' Banquet attendance. Maps are available at registration desk.





## TWENTY-SEVENTH SPACE CONGRESS PROGRAM

TUESDAY, APRIL 24

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

Howard Johnson Plaza-Hotel

Introductions: Doug Sargent  
Dick Lyon

Speaker: Congressman Bill Nelson

Bill was elected to the U.S. Congress in 1978 and was re-elected to his sixth term in 1988. He is chairman of the Space Science and Applications subcommittee and a member of the Banking, Finance and Urban Affairs Committee.

As chairman of the subcommittee, Bill trained and flew with the crew of the Space Shuttle Columbia. After being launched from Kennedy Space Center on January 12, 1986, Columbia and its crew returned to Earth six days later at Edwards Air Force Base in California. Bill conducted several experiments designed to aid cancer research, the storage of human blood, and the understanding of man's adaptation to space travel.



Bill is a fifth generation Floridian whose family settled in Washington County in Florida's Panhandle in 1829. His grandparents homesteaded in 1915 on what is now the Kennedy Space Center. He attended public schools in Brevard County and graduated from Melbourne High School in 1960. He earned a Bachelor of Arts degree at Yale University, a law degree from the University of Virginia and was admitted to the Florida Bar in 1968. Bill was a U.S. Army Captain, serving on active duty from 1968 to 1970.

He was elected to the Florida legislature in 1972 and served six years until he was elected to Congress. While a state legislator, he was honored by the Florida Jaycees as one of the Five Outstanding Young Men of Florida and was nominated as the Most Valuable Member of the House of Representatives.

On February 14, 1990, Bill announced his candidacy for Governor of Florida.

Four Florida colleges have conferred upon him honorary degrees - a Doctor of Laws from Rollins College, a Doctor of Science from Florida Institute of Technology, a Doctor of Laws from Bethune-Cookman College and a Doctor of Science from Embry-Riddle Aeronautical University.

He is married to the former Grace Cavert of Jacksonville. They have two children: Billy, age 14, and Nan Ellen, age 13. The family attends the Tabernacle Church in Melbourne and Christ Church of Arlington, Virginia.

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

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

### SPACE OPPORTUNITIES FOR THE NEXT CENTURY

Panel Chairman: Lt. Gen. Donald L. Cromer, USAF, Commander, Space Systems Division, Los Angeles AFB, CA  
Session Organizer: Capt. Gary Spirnak, USAF, 6555th Aerospace Test Group, CCAFS, FL

#### MEMBERS:

The Honorable Martin C. Faga, Assistant Secretary of the Air Force for Space, Office of the Secretary of the Air Force  
Lt. Gen. George L. Morahan, Jr., USAF, Director for Strategic Defense Initiatives Organization, Office of the Secretary of Defense  
Dr. Victor H. Reis, Deputy Director, Defense Advanced Research Projects Agency (DARPA)  
Brig. Gen. Donald G. Hard, USAF, Deputy Director of Plans, Office of the Deputy Chief of Staff, Plans and Operations, Headquarters, USAF

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

Holiday Inn, Manatee Room

Introductions: Doug Sargent  
Dick Lyon

Speaker: Sanford N. McDonnell, Chairman Emeritus, McDonnell Douglas Corporation

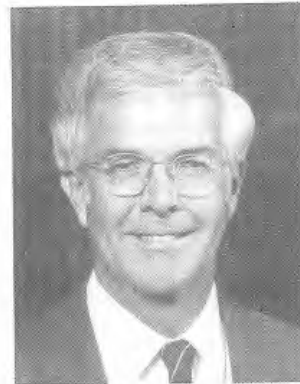
Sanford N. McDonnell was born in Little Rock, Arkansas and attended Princeton University where he received a Bachelor of Arts in Economics. He earned a Bachelor of Science in Mechanical Engineering from the University of Colorado and a Master of Science in Applied Mechanics from Washington University.

At McDonnell Aircraft Company in St. Louis, he worked as a stress engineer, an aerodynamicist, a design engineer, and Group Leader, progressing to companywide Project Manager for the F-101. He was Vice President-General Manager for the F4H Project and later for all combat aircraft. He was elected a Director in 1962, and to the Board's Executive Committee in 1963. He was made Vice President-Aircraft General Manager in 1965 and elected President in 1966. From this time he has been intimately involved with the major space projects as well as aircraft projects.

McDonnell was elected a Director of McDonnell Douglas Corporation in 1967 at the time of merger with Douglas Aircraft Company, and in 1971 was elected President of the Corporation. In 1972, he was elected Chief Executive Officer.

From 1980 he served as Chairman and Chief Executive Officer of the Corporation and also as Chairman of the McDonnell Douglas Foundation. He became Chairman Emeritus of the Corporation in 1988.

He is a member of Tau Beta Pi, and a Fellow of the American Institute of Aeronautics and Astronautics. He holds honorary degrees from the following institutions: Washington University, University of Missouri, St.



Louis University, Maryville College of St. Louis, Oklahoma Christian College, University of Colorado, and Lehigh University.

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

**A. DoD RESEARCH AND DEVELOPMENT**

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

Session Chairman: Col. M. T. Runkle, USAF, GPS Program, Space Systems Division, Los Angeles AFB, CA

Session Organizer: Capt. Gary Spirmak, USAF, 6555th Aerospace Test Group, CCAFS, FL

1. MEETING THE DoD SPACE TEST OPERATIONS SUPPORT REQUIREMENTS OF THE FUTURE  
Col. James L. Grogan, III, USAF, Commander, Consolidated Space Test Center (CSTC), Onizuka AFB
2. EMPLOYING ARTIFICIAL INTELLIGENCE TO MEET SPACE REQUIREMENTS  
Capt. James M. Skinner, USAF, Artificial Intelligence Technology Officer, Air Force Space Technology Center  
Capt. Richard Higgins, Jr., USAF Technology Segment Manager, Air Force Space Technology Center
3. SMART STRUCTURES/SKINS PROGRAM OVERVIEW  
Capt. Douglas DeHart, USAF, Chief of Engineering, Composite Structure Laboratory, Air Force Astronautics Laboratory
4. ADVANCED LIQUID FEED EXPERIMENT (ALFE)  
Bao K. Nguyen, Project Manager, Space Propulsion Technology, Air Force Astronautics Laboratory
5. NEUTRAL PARTICLE BEAM TECHNOLOGY  
Lt. Col. Michael T. Toole, USAF, Deputy Director for Particle Beam Directed Energy, Strategic Defense Initiative Organization  
Maj. Jay C. Willis, USA, Army Strategic Defense Command
6. STARLAB OVERVIEW  
Lt. Col. Randall G. Oliver, USAF, Starlab Program Manager, Strategic Defense Initiatives Organization  
John E. Moyer, Analytic Sciences Corporation

**B. SCIENCE PAYLOADS**

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

Session Chairman: Joe Alexander, NASA Assistant Associate Administrator for Space Science and Applications, NASA Headquarters

Session Organizer: Lee O'Fallon, NASA, Kennedy Space Center

1. AN OVERVIEW OF THE SPACELAB PROGRAM  
Robert H. Benson, Director, Flight Systems Division, Office of Space Science & Applications, NASA Headquarters
2. SPACELAB-J INVESTIGATIONS OF VESTIBULAR NERVE DEVELOPMENT  
John E. Love, Florida Institute of Technology  
Glenn M. Cohen, Florida Institute of Technology
3. THE GREAT OBSERVATORIES PROGRAM  
Dr. Edward J. Weiler, Chief UV/Visible Astrophysics Branch, NASA Headquarters

4. KISS-THE KIEPENHEUER INSTITUTE SOLAR SPECTROGRAPH  
Dr. Rudiger Gerndt, Kiepenheuer Institute, Dornier GmbH  
Dr. Edgar Holzle, Kiepenheuer Institute, Dornier GmbH

5. EARTH OBSERVING SYSTEM  
Dr. Stanley Wilson, EOS Program Scientist, Earth Science and Applications Division, NASA Headquarters

6. SCIENCE AND APPLICATIONS PAYLOADS IN THE 90'S  
Carmine E. DeSanctis, Chief, Space Science and Applications Group, NASA, Marshall Space Flight Center

7. PRELAUNCH PROCESSING SCIENTIFIC PAYLOADS SINCE CHALLENGER: LESSONS LEARNED EXERCISE  
Roelof L. Schuiling, Test Management Branch, NASA, Kennedy Space Center

**C. SMALL MICROGRAVITY CARRIERS**

**Holiday Inn, Manatee Room**

Session Chairman: Dr. Charles Lundquist, Director, Consortium for Materials Development in Space, University of Alabama in Huntsville

Session Organizer: Dr. Dwight Easterly, CSAT, Cocoa Beach, FL

1. DROP TOWER "BREMEN" - SHORT TIME MICROGRAVITY EXPERIMENTS DURING FREE FALL  
Dr. H. Dittus, Dr. C. Eigenbrod, U. Kaczmarczik, Dr. J. Middleberg, H. J. Rath, R. Schwark, Center of Applied Space Technology and Microgravity (ZARM), University of Bremen
2. AUTONOMOUS MICROGRAVITY INDUSTRIAL CARRIER (AMICA) INITIATIVE  
William J. Caimo, General Electric Astro-Space Division  
Wolfgang Kohler-Naumann, MBB-ERNO, Bremen
3. MIKROBA - MISSION OPPORTUNITY FOR MICROGRAVITY PAYLOADS  
A. Tegtmeier, Opto-Elektronik Und Hydraulik-System, GmbH, Bremen  
Dr. K. Kretzschmar, Opto-Elektronik Und Hydraulik-System, GmbH, Bremen
4. LOW GRAVITY INVESTIGATIONS ON SUBORBITAL ROCKETS  
Prof. Francis C. Wessling, Consortium for Materials Development in Space  
Dr. Charles A. Lundquist, Director, Consortium for Materials Development in Space
5. REUSABLE REENTRY SATELLITE: AND ESSENTIAL CAPABILITY FOR MICROGRAVITY AND SPACE LIFE SCIENCE EXPERIMENTS  
Robert G. Efrus, Vice-President, Space Tech, CSAT
6. THE TEXUS PROGRAM  
Burkhard Franke, TEXUS Program, MBB-ERNO

**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: Doug Sargent

Dick Lyon



Speaker:

NASA Administrator, Vice Admiral  
Richard H. Truly, USN Retired

Richard H. Truly became the eighth Administrator of NASA on July 1, 1989. One day earlier, he concluded his naval career of more than 30 years, retiring as a Vice Admiral, United States Navy. He is the first astronaut to head the nation's civilian space agency.



Truly became NASA's Associate Administrator for Space Flight on February 20, 1986. In this position, he led the painstaking rebuilding of the Space Shuttle program. This was highlighted by NASA's celebrated "return to flight" on September 29, 1988, when Discovery lifted off on the first Shuttle mission in almost three years.

Before returning to NASA, he served as the first commander of the Naval Space Command, Dahlgren, Virginia, established October 1, 1983. His Navy career began in 1959, when he graduated from Georgia Institute of Technology, which he attended as a Naval R.O.T.C. midshipman and where he earned a Bachelor's Degree in Aeronautical Engineering.

Following flight school in 1960, his initial tour of duty, Fighter Squadron 33, was aboard USS Intrepid and USS Enterprise, and he made more than 300 carrier landings. From 1963 to 1965, he was a student and then instructor at the U.S. Air Force Aerospace Research Pilot School, Edwards Air Force Base, California.

In 1965, Truly became one of the first military astronauts selected to the Air Force's Manned Orbiting Laboratory program in Los Angeles, California, and transferred to NASA as an astronaut in August 1969. He served as capsule communicator for all three of the manned Skylab missions in 1973 and the Apollo-Soyuz mission in 1975. He has logged over 7,500 hours in numerous military and civilian jet aircraft.

He was pilot for one of the two-man crews that flew Space Shuttle Enterprise approach and landing test flights during 1977, backup pilot for STS-1, pilot for STS-2 in Space Shuttle Columbia, and was commander of STS-8 in Space Shuttle Challenger.

On January 18, 1989, Truly was awarded the Presidential Citizen's Medal by President Reagan. His NASA awards include two NASA Distinguished Service Medals, the NASA Outstanding Leadership Medal, two NASA Exceptional Service Medals, and two NASA Space Flight Medals. His military decorations include the Defense Distinguished Service Medal, the Defense Superior Service Medal, two Legions of Merit, the Navy Distinguished Flying Cross, and the Meritorious Service Medal.

Truly was born in Fayette, Mississippi, on November 12, 1937, and attended school in Fayette and Meridian, Mississippi. He is married to the former Colleen (Cody) Hanner of Milledgeville, Georgia. They have three children — Mike, Dan and Lee — and three grandchildren — Ashley, Courtney and Peter.

He has received more than a dozen other major distinguished awards including the Collier Trophy twice, the Goddard Memorial Trophy twice, the Kincheloe Award and Doolittle Award.

WEDNESDAY, APRIL 25

PANEL SESSION II (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 Program, NASA Headquarters, Washington, D.C.  
Session Organizer: Lewis L. Peach, Jr., Deputy Director, Space Station Engineering, NASA Headquarters, Washington, D.C.

#### MEMBERS:

Arnold D. Aldrich, Associate Administrator for Aeronautics and Space Technology, NASA Headquarters  
Ms. Marcia Smith, Specialist in Aerospace Policy, Library of Congress  
Dr. Jack L. Kerrebrock, Professor of Aeronautics and Astronautics at MIT, Fairchild Scholar, California Institute of Technology  
Dr. Edmond M. Reeves, Deputy Director, Flight Systems Division, Office of Space Science and Applications, NASA Headquarters  
Angelo (Gus) Guastaferrro, Vice President, NASA Space Flight Programs, Lockheed Missiles and Space Company

LUNCHEON (12:00 noon to 1:30 p.m.)  
Holiday Inn, Manatee Room

Introductions: Doug Sargent  
Dick Lyon

Speaker: Barbara Morgan, "Teacher in Space"  
Designee

Barbara Morgan was born in Fresno, California where her parents Jerome and Marian Radding still reside.

She graduated from Hoover High School in Fresno in 1969, earned a Bachelor of Arts (with distinction) in Human Biology from Stanford University in 1973 and her teaching credentials in 1974 from the College of Notre Dame in Belmont, California.

She began her teaching career in 1974 at the Flathead Indian Reservation at Arlee Elementary School in Arlee, Montana, where she taught remedial reading and math. From 1975 to 1978, she taught remedial reading/math and second grade at McCall-Donnelly Elementary School in McCall, Idaho. From 1978 to 1979, she taught English and Science to third graders at Colegio Americano de Quito in Quito, Ecuador. Since 1979, she has taught third/fourth grade combination classes and fourth, second and third grade at McCall-Donnelly Elementary School.

She is deeply involved in her community, as member and past acting musical director of McCall Chamber Orchestra, member of the McCall Chorale and McCall Mandolin Orchestra, treasurer and concert organizer for McCall Folklore Society, and musician for local drama productions.





She is a member of Phi Beta Kappa, National Education Association, National Science Teachers Association, International Reading Association, state and local education associations, and the PTA.

Morgan was selected as the backup candidate for the NASA Teacher in Space Project on July 19, 1986. From September 1985 to January 1986, she trained with Christa McAuliffe at the Johnson Space Center, Houston. Following the 51-L accident, she assumed the duties of the Teacher in Space designee. From March - July 1986 she worked with NASA, speaking to educational organizations throughout the country. In the Fall of 1986, she returned to Idaho to resume her teaching activities. She currently teaches 2nd grade at McCall-Donnelly Elementary, and also continues to work with NASA's Educational Affairs Division.

She was married to Clayton Michael Morgan in 1978, and is the mother of two sons, Adam Clayton Morgan, born in September, 1987, and Ryan Jacob Morgan, born in May, 1989.

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

### **A. SPACE STATION**

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

Session Chairman: John Cox, Director, Program Utilization and Operations for the Space Station Program, NASA Headquarters  
Session Organizer: Ms. Nancy Lorenz, McDonnell Douglas Space Systems Company, Florida

1. COLUMBUS ELEMENTS PROCESSING NEEDS AT KSC  
Dr. Dieter Husung, COLUMBUS Ground Operations Manager, MBB-ERNO, Bremen
2. SPACE STATION PAYLOAD ADAPTATION SYSTEM  
Kenneth R. Taylor, Materials Processing in Space Group Program Development, Marshall Space Flight Center  
Charles L. Adams, Space Engineering and Hardware Group, Wyle Laboratories, Huntsville
3. SPACE STATION ASSURED CREW RETURN VEHICLE (ACRV) SYSTEM AND OPERATIONAL CONSIDERATIONS  
George F. Fraser, Space Transportation Systems Division, Rockwell International
4. SPACE STATION REQUIREMENTS AND TRANSPORTATION OPERATIONS FOR LUNAR OUTPOST  
Archie C. Young, MSFC  
John A. Mulqueen, MSFC  
James W. McCarter, MSFC  
Ms. Margaret C. Varner, MSFC  
Richard W. Brown, MSFC  
Barton S. Perrine, MSFC
5. SPACE STATION FREEDOM ACCOMMODATION OF THE HUMAN EXPLORATION INITIATIVE  
Barry D. Meredith, NASA, Langley Research Center  
Lewis L. Peach, Jr., NASA Headquarters  
Peter R. Ahlf, Rudolph J. Saucillo, McDonnell Douglas Space Systems Company
6. LUNAR VEHICLE ASSEMBLY AND PROCESSING ON SPACE STATION FREEDOM.  
Patrick A. Troutman, NASA Langley Research Center  
George G. Gano, NASA Langley Research Center

### **B. TECHNOLOGY PAYLOADS AND ROBOTICS**

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

Session Chairman: Jon Pyle, Project Manager, Flight Projects Division, Office of Aeronautics and Space Technology, NASA Headquarters, Washington, D.C.  
Session Organizer: Keith Chandler, Boeing Aerospace Operations, Florida

1. ELECTRIC INSERTION TRANSFER EXPERIMENT (ELITE)  
Richard S. Matlock, Astronautics Laboratory, Edwards AFB  
Jason R. Feig, Astronautics Laboratory, Edwards AFB  
Michael R. Dickey, Astronautics Laboratory, Edwards AFB
2. SENSOR DATA DISPLAY FOR TELEROBOTIC SYSTEMS  
Dr. Margaret M. Clarke, Rockwell International Corporation  
Davoud Manouchehri, Rockwell International Corporation
3. DEVELOPMENT OF THE LIQUID PLUME IMAGING EXPERIMENT AS AN ADJUNCT TO THE STARLAB MISSION  
Brian McKee, Astronautics Laboratory, Edwards AFB  
Dave Barnhart, Astronautics Laboratory, Edwards AFB  
Ron Wojnar, Astronautics Laboratory, Edwards AFB  
Chuck Fulk, Astronautics Laboratory, Edwards AFB  
Bryan Wallace, Astronautics Laboratory, Edwards AFB  
Mark Coleman, Astronautics Laboratory, Edwards AFB
4. THE DEPARTMENT OF DEFENSE SPACE TEST PROGRAM  
Maj. Mark E. Pestana, USAF, Chief, Mission Planning Division, Space Test and Transportation Programs Office, Headquarters Space Systems Division
5. A LOOK AT NASA'S IN-SPACE TECHNOLOGY EXPERIMENTS PROGRAM  
Lenwood G. Clark, NASA, Langley Research Center

### **C. COMMERCIAL INITIATIVES**

**Holiday Inn, Manatee Room**

Session Chairman: Steven L. Morgan, Director of Space Industry Development, Virginia Center for Innovative Technology, Herndon, VA  
Session Organizer: Bob Mellor, Lockheed Space Operations, Florida

1. COMMERCIAL SPACE INITIATIVES  
Dr. Barbara A. Stone, Director, Plans, Policy, and Evaluation Division, Office of Commercial Space Programs, NASA Headquarters  
Peter W. Wood, Consultant
2. U.S. DEPARTMENT OF COMMERCE: OFFICE OF COMMERCIAL SPACE INITIATIVES AND PLANS  
Ms. Laura B. Ayres, Associate Director, Special Programs, Office of Space Commerce, U.S. Department of Commerce
3. ECONOMIC IMPLICATIONS OF HYPERSONIC VEHICLES  
Dr. David C. Webb, President, International Hypersonic Research Institute, Winter Springs, FL
4. SPACEHAB: ACCOMMODATIONS FOR COMMERCIAL MICROGRAVITY EXPERIMENTATION  
James E. Shepard, Senior Manager, Spacehab Payload Development, McDonnell Douglas Space Systems Company

5. SSI's COMMERCIAL SPACE LAUNCH SERVICES  
Donald K. (Deke) Slayton, President, Space Services, Inc.
6. PEGASUS AND TAURUS LAUNCH VEHICLES  
Edwin G. Rutkowski, Director, Marketing, Orbital Sciences Corporation  
Chris C. Schade, Orbital Sciences Corporation
7. FLORIDA SPACEPORT DEVELOPMENT  
Edward O'Connor, Executive Director, Spaceport Florida

#### EXHIBIT CENTER COCKTAIL RECEPTION

(6:00 p.m. to 7:30 p.m.)

Cocoa Beach Hilton, Exhibit Hall

#### THURSDAY, APRIL 26

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

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

##### SPACE TRANSPORTATION SYSTEM AND DERIVATIVES

Panel Chairman: Robert L. Crippen, Director, Space Shuttle, NASA Headquarters, Washington, D.C.  
Session Organizer: Frank S. Coe, Acting Director, Program Planning and Control, NASA Headquarters, Washington, D.C.

##### MEMBERS:

Jay F. Honeycutt, Director of STS Management and Operations, NASA, KSC  
Tommy W. Holloway, Assistant Director for Space Shuttle Programs, Mission Operations Directorate, NASA, JSC  
G. Lee Norbraten, Deputy Manager, Systems Engineering Office, Space Shuttle Engineering Integration Office, NASA, JSC  
Robert J. Schwinghamer, Deputy Director for Space Transportation Systems, Science and Engineering, NASA, MSFC  
Daniel M. Germany, Manager, Orbiter and GFE Projects Office, NASA, JSC  
Lowell K. Zoller, Manager, Advanced Solid Rocket Motor Project, Shuttle Projects Office, NASA, MSFC

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

###### A. STS AND DERIVATIVES

Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairman: James Madewell, Director, Advanced Programs, Lockheed Space Operations Company, Florida  
Session Organizer: Mark Foshee, Lockheed Space Operations Company, Florida

1. EVOLUTIONARY TRANSPORTATION CONCEPTS  
Charles Teixeira, NASA, JSC
2. ADVANCED SOLID ROCKET MOTOR PROJECT  
Howard O. Trudeau, Vice President and Project Manager, Lockheed Missiles and Space Company
3. STS DERIVATIVE CARGO VEHICLES FOR THE 1990'S DECADE AND BEYOND  
Billy W. Shelton, NASA, MSFC

4. AMERICA'S SPACE TRANSPORTATION SYSTEM FOR THE 1990'S AND BEYOND  
Ardell W. Nease, Project Director, Orbiter Improvements, Rockwell International  
Ms. Kim E. Smith, Program Development Manager, Orbiter Improvements, Rockwell International  
Kenneth E. Lengner, Project Manager, Assured Shuttle Availability, Rockwell International
5. HUMAN EXPLORATION INITIATIVE  
William D. Goldsby, Program Integration & Special Projects Office, NASA, KSC
6. SPACE SHUTTLE AVIONICS UPGRADE: ISSUES AND OPPORTUNITIES  
Richard A. Swaim, IBM, Systems Integration Division  
William B. Wingert, IBM, Systems Integration Division

###### B. SPACE EDUCATION

Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: Dr. Norm Thagard, NASA Astronaut  
Session Organizer: Dr. James Ragusa, University of Central Florida, Orlando, FL

1. SPACE EXPLORATION THROUGH EDUCATION  
Charles D. Quincy, Orbiter Processing Facility Manager, NASA, KSC
2. THE NASA SPACE LIFE SCIENCES TRAINING PROGRAM - PREPARING THE WAY!  
Ronald Biro, Bionetics Corporation  
Bill Munsey, Payload Projects Management, NASA, KSC  
Dr. Irene Long, Biomedical Operations and Research Office, NASA, KSC
3. JOURNEYS OF THE MIND: SPACE EDUCATION  
Dr. Patricia Manning, Professor, College of Education, University of Central Florida  
Dr. James M. Ragusa, Associate Professor, College of Business, University of Central Florida  
Ms. Leslie Neihouse, Director, U.S. Space Camp, FL
4. SPACE TECHNOLOGY GRADUATE PROGRAM FOR ENGINEERS AND SCIENTISTS  
Dr. Harold S. Sweet, Chairman, Space Technology Academic Program, Florida Institute of Technology  
Dr. John R. Patton, Director, Spaceport Program, Florida Institute of Technology  
Lt. Joseph B. Auer, Adjunct Professor, Florida Institute of Technology
5. GIVING DIRECTION TO THE DREAM: NEW EXPERIENCES IN SPACE EDUCATION  
Frank Sietzen, Jr., Space Technology Writer

###### C. DoD SPACE OPERATIONS

Holiday Inn, Manatee Room

Session Chairman: Col. James K. McDonough, USAF, Air Force Space Command, Peterson AFB, CO  
Session Organizer: Capt. Gary Spirnak, USAF, 6555th Aerospace Test Group, CCAFS, FL



1. ORBITING SENTINELS FOR SECURITY  
Lt. Col. Stanley G. Rosen, USAF, Space Systems Division
2. CONCEPTS FOR USING SMALL SATELLITES TO EVOLVE  
CROSSLINKING FOR ROBUST SATELLITE COMMANDING  
Lt. Tom Utsch, USAF, Space Systems Division
3. TECHNOLOGY APPLICATIONS TO IMPROVE LAUNCH VEHI-  
CLE RESPONSIVENESS  
Mr. James Hollopeter, Manager, Advanced Launch System Oper-  
ations Segment, General Dynamics, Space Systems Division
4. RAPID LAUNCH - IMPLICATIONS TO SPACECRAFT DESIGN  
AND OPERATIONS  
Lt. Janice Norton, USAF, Space Systems Division
5. PRUDENT PLANNING FOR SPACE OPERATIONS  
Lt. Col. Owen E. Jensen, USAF, Space Command

**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

#### MEET THE ASTRONAUTS

Panel Chairman: Lt. Gen. Forrest S. McCartney, USAF Retired,  
Center Director, NASA, KSC  
Astronauts: Dr. Norm Thagard, currently assigned to STS-  
42, and other astronauts as available between training commitments.

#### FRIDAY, APRIL 27

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

**DEPARTMENT OF DEFENSE SPACE OPERATIONS: CAPABILITIES  
FOR THE WAR-FIGHTER**

Panel Chairman: Lt. Gen. Thomas S. Moorman, Jr., USAF, Com-  
mander, Air Force Space Command, Peterson AFB, CO  
Session Organizer: Capt. Gary Spirnak, USAF, 6555th Aerospace  
Test Group, CCAFS, FL

#### MEMBERS:

Brig. Gen. Ronald D. Gray, USAF, DCS Operations, Air Force Space  
Command  
Col. Durand E. Cleveland, USAF, Vice Director of Operations, U.S.  
Space Command  
Col. Roman I. Ellis, USA, Commander, Army Space Command  
Dr. William E. Howard III, Technical Director, Naval Space Command

**SPACE CONGRESS GOLF TOURNAMENT**  
(11:30 a.m. to 5:00 p.m.)

Patrick AFB Golf Course - Map available at registration desk.  
Buffet lunch from 11:30 a.m. - Shotgun start at 1:00 p.m.

**PIONEERS' ANNUAL BANQUET (6:30 p.m.)**  
Patrick AFB, Officer's Club

Social Hour: 6:30  
Dinner: 7:30  
Speaker: 8:30

James C. Adamson, Astronaut,  
Col., U.S. Army

#### PROGRAM SUMMARY

##### MONDAY, April 23

12:00 noon to 5:00 p.m. REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room

##### TUESDAY, April 24

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

9:00 a.m. to 11:30 a.m. PANEL SESSION I: SPACE OPPORTUNI-  
TIES FOR THE NEXT CENTURY  
Howard Johnson Plaza-Hotel

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  
Hilton Convention Center

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. DoD RESEARCH & DEVELOPMENT  
Howard Johnson Plaza-Hotel  
B. SCIENCE PAYLOADS  
Howard Johnson Plaza-Hotel  
C. SMALL MICROGRAVITY CARRIERS  
Holiday Inn Manatee Room

7:00 p.m. BANQUET SOCIAL HOUR  
Howard Johnson Plaza-Hotel

8:00 p.m. BANQUET  
Howard Johnson Plaza-Hotel

##### WEDNESDAY, April 25

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 STATION  
Howard Johnson Plaza-Hotel

11:00 a.m. to 8:00 p.m. EXHIBITS  
Hilton 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 Room

2:00 p.m. to  
5:00 p.m. PAPER SESSION II:  
A. SPACE STATION  
Howard Johnson Plaza-Hotel  
B. TECHNOLOGY PAYLOADS &  
ROBOTICS  
Howard Johnson Plaza-Hotel  
C. COMMERCIAL INITIATIVES  
Holiday Inn Manatee Room

6:00 p.m. to  
7:30 p.m. EXHIBIT CENTER COCKTAIL RECEPTION  
Hilton Convention Center

#### THURSDAY, April 26

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 TRANSPORTATION SYSTEM & DERIVATIVES  
Howard Johnson Plaza-Hotel

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  
Hilton Convention Center

1:00 p.m. to  
4:00 p.m. PAPER SESSION III:  
A. NSTS & DERIVATIVES  
Howard Johnson Plaza-Hotel  
B. SPACE EDUCATION  
Howard Johnson Plaza-Hotel  
C. DoD SPACE OPERATIONS  
Holiday Inn Manatee Room

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

#### FRIDAY, April 27

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: DEPARTMENT OF DEFENSE SPACE OPERATIONS: CAPABILITIES FOR THE WAR-FIGHTER  
Howard Johnson Plaza-Hotel

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. MISSILE, SPACE AND RANGE PIONEERS' ANNUAL BANQUET  
Patrick AFB, Officer's Club

#### ACKNOWLEDGEMENTS

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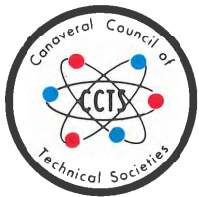
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Gabrielle Hammond  
City Officials of Cocoa Beach, to Mayor Bob Lawton and especially  
the Cocoa Beach Police Department  
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