Space Congress Programs

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1989 Twenty-Sixth Space Congress Preliminary Program

Canaveral Council of Technical Societies

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Cocoa Beach, Florida April 25, 26, 27, 28, 1989
Welcome to the 26th annual Space Congress. In its twenty-six years, this Space Congress has maintained its reputation as the premier conference on space technology and this year is no exception. The theme "Space - The New Generation" is appropriate with our Nation's challenge of successfully returning to space.

The 26th 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. In addition, the Space Coast communities, local Aerospace Contractors and citizens are instrumental in putting together this most informative symposium.

In the next four days you will hear outstanding speakers such as Congressman Bill Nelson at our opening session and Governor Bob Martinez at the Tuesday evening banquet. Panels will examine NSTS, Space Station and DOD's part of the overall picture. Panel Chairmen include outstanding leaders Mr. Arnold Aldrich, Lt. Gen. Donald L. Cromer, Mr. James B. Odom, Col. Robert T. Cote and Col. Vito J. Pagano. Technical paper sessions cover such topics as the International Aspect of Space Station, Lunar Base development, and Mission to Mars, to name a few. A Press Conference will feature well known media personalities and give us a chance to be on the questioning side. At the Wednesday luncheon Cosmonaut Valentin Lebedev will share his views on the 219 days he spent in space.

We know that you will agree after this week-long symposium that all our programs have been challenging and informative. We will be soliciting your evaluation of the Congress so that we can continue to improve this outstanding annual "Space" event.

If there is anything any of the committee members can do to make your stay at the Congress more enjoyable, please let us know.

We are happy to have you here and hope that you have a wonderful time.

L. J. Holloway
General Chairman
26th Space Congress
GENERAL INFORMATION

HEADQUARTERS/REGISTRATION

Headquarters for the Twenty-Sixth 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 24, 1989. 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.

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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 784-9324.

PRESS ROOM

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 Mitch Varnes 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) 784-9190, 4933, or 9208 and Howard Johnson Plaza-Hotel 784-9367, or 0056.

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) 784-9179, or 9184.

PROCEEDINGS

The proceedings of the Twenty-Sixth 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 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 10:00 a.m. to 7:00 p.m. Tuesday, from 10:00 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

Advanced Process Systems
Allen-Bradley Company
Applied Business Technology
Aviation Week
Ball Aerospace
BAMSI
Bechtel
Boeing Company
Brevard Community College
Canaveral Council of Technical Societies
Computer Sciences Corporation
Digital Equipment Corporation
Diversified Information Systems
Eastman Kodak
EG&G Florida, Inc.
Embry-Riddle Aeronautical University
Engineering Energy Systems
E’Prime Aerospace
Florida Department of Commerce
Florida Institute of Technology
General Dynamics Corporation
Government Technology Services, Inc.
Harris Corporation
Hercules Aerospace
Honeywell
International Business Machines Corporation
Krieger Publishing
Lockheed Missiles and Space Company
Martin Marietta Corporation
McDonnell Douglas Space Systems Corporation
Morton Thiokol
Pan Am World Services, Inc.
Perkin-Elmer Corporation
Rocketdyne
Rockwell International
Space Systems Services, Inc.
Spectrum Technology Group
Systonetics
TRW, Inc.
United States Air Force
United States Navy
United Technologies Corporation
University of Central Florida
University of Florida
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 26. The awards will be presented to the winners at 8:00 p.m. "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 27.

ATTRACTION CENTERS

Late April in Florida is a delightful time of the year for the entire family. The weather is pleasant, the water is 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 and three and four day cruises aboard the SS Oceanic or the SS Atlantic 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 in the Magic Kingdom of Walt Disney World and Epcot Center - 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 - rides and fun at Boardwalk & Baseball.

**PIONEERS' DAY**

The Pioneers' Day Banquet '89 will be held on Friday, April 28, at the Officer's Open Mess, Patrick Air Force Base.

Speaker: To be announced.

Social Hour: 7:00 p.m.

Dinner: 8:00 p.m.

Speaker: 9:00 p.m.

Registration is April 25, 26 and 27 at the Dolphin Room, Holiday Inn, Cocoa Beach, and 5:30 to 6:30 p.m. at the Officer's Open Mess on April 28.

**CANAVERAL COUNCIL OF TECHNICAL SOCIETIES**

Air Force Association
Armed Forces Communication Electronics 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 of Safety Engineers
American Society for Training and Development
American Welding Society
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
Society for the Advancement of Materials & Process Engineering
Society of Manufacturing Engineers
Society of Logistics Engineers
Society of Photo-Optical Instrumentation Engineers
Society for Technical Communication

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 28.

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 $25, each person. A maximum of 140 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. 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.
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 was 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.

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.

Congressman Nelson was unanimously elected chairman of the U.S. Congressional Travel and Tourism Caucus in January. The caucus is a bipartisan coalition of more than 150 members of Congress who share the common goal of increasing awareness of tourism and its economic impact in the U.S.

He is married to the former Grace Cavert of Jacksonville. They have two children: Billy, age 12, and Nan Ellen, age 11. 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

NATIONAL SPACE TRANSPORTATION SYSTEM

Session Chairman: Mr. Arnold D. Aldrich, Director, National Space Transportation System, NASA Headquarters, Washington, D.C.
Session Organizers: Mr. Frank S. Coe, Acting Director, Program Planning and Control, NASA Headquarters, Washington, D.C.
Mr. Cecil W. Houston, Manager, MSFC Resident Office, KSC, FL

MEMBERS:

Col. Richard O. Covey, Pilot STS-26, NASA, JSC
Mr. Robert M. Glaysker, Vice President, Engineering, Space Transportation Systems Division, Rockwell International
Mr. Richard L. Davis, Vice President and Assistant General Manager, Space Operations, Morton Thiokol, Inc.
Mr. Robert D. Paster, Vice President and Program Manager, Space Shuttle Main Engine, Rocketdyne Division, Rockwell International
Mr. Leon Ch Banich, Manager, NSTS Integration and Operations, NASA, JSC

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

Session Chairman: Mr. Julian W. Scheer, Senior Vice-President of Corporate Affairs, The LTV Corporation, Washington, D.C.

MEMBERS:

Mr. John Zarrella, Correspondent, CNN
Mr. Jay Barbree, Aerospace Correspondent, NBC, Radio/Television
Mr. Bill Harwood, Aerospace Journalist, UPI
Mr. John Glick, Senior Writer and National Correspondent, Orlando Sentinel

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

A. NSTS - THE NEXT GENERATION
Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairman: Mr. Jack Harden, Associate Director, STS Management and Operations, NASA, KSC
Session Organizer: Ms. Karin Biega, Mission Planning Office, STS Management and Operations, NASA, KSC

1. ADVANCED SOLID ROCKET MOTOR (ASRM)
Mr. Kenneth W. Jones, Chief Engineer, ASRM Engineering Office, Space Transportation Systems Directorate, NASA, MSFC
Mr. Lowell K. Zoller, Project Manager, Advanced Solid Rocket Motor, Shuttle Projects Office, NASA, MSFC

2. LIQUID ROCKET BOOSTERS FOR SHUTTLE
Mr. James E. Hughes, Manager, LRB Studies, NASA, KSC

3. LAUNCH SITE INTEGRATION OF LIQUID ROCKET BOOSTERS
Mr. Leland P. Scott, Advanced Programs, Lockheed Space Operations Company, Titusville, FL
Mr. William J. Dickinson, Future Launch Systems Office, NASA, KSC

4. SHUTTLE EVOLUTION FOR THE 1990'S
Mr. Charles Teixeira, Chief Systems Definition Branch, NASA, JSC
Mr. Charles Mallini, Aerospace Engineer, Advanced Programs Office, NASA, JSC

5. SHUTTLE-C HEAVY-LIFT VEHICLE OF THE 90'S
Mr. Robert G. Eudy, Manager, Shuttle-C Task Team, NASA, MSFC

6. ADVANCED MANNED LAUNCH SYSTEM (AMLS) REVIEW
Dr. Theodore A. Taiay, Space Systems Division, NASA, LaRC
Mr. Douglas O. Stanley, Vigyan Research Associates, Inc., Hampton, VA
Mr. Roger A. Lepsch, Space Systems Division, NASA, LaRC
B. NATIONAL SPACE PROGRAMS
Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: Mr. L. J. (Bud) Evans, President, Center for Space and Advanced Technology (CSAT), Arlington, VA
Session Organizer: Mr. Dwight Easterly, VITRO Corporation, Cocoa Beach, FL

1. GERMAN NATIONAL SPACE PROGRAM
Dr. Udo Pollvogt, President, ERNO-USA, Inc., German National Space Program

2. CANADA'S PLACE IN SPACE
Mr. Bryan Erb, National Research Council - Canada

3. INDIA - A SPACE PIONEER
Mr. Arun Batra, First Secretary, Indian Space Research Organization

4. ITALY'S EXPANDING COMMITMENT TO SPACE
Mr. Vincenzo Letico, Italian National Space Plan

5. FRANCE'S INTERNATIONAL SPACE PROGRAM: MAJOR CONTRIBUTION TO SPACE TECHNOLOGY AND INFRASTRUCTURE
Author's name not available at time of publication.

C. SPACE ENTERPRISE DEVELOPMENT
Holiday Inn, Manatee Room

Session Chairman: Mr. Chick Garcia, Manager, Grumman Corporate Development, Titusville, FL
Session Organizer: Mr. Bob Mellor, Lockheed Space Operations Co., KSC, FL

1. A FLORIDA FIRM ENTERS THE COMMERCIAL SPACE BUSINESS
Mr. James A. Ralph, President, International Space Corp., Melbourne, FL

2. MANNED INDUSTRIAL SPACE SOONEST
Mr. Leon Ronquillo, Martin Marietta Manned Space Systems, Chalmette, LA
Mr. Dean Monitor, Martin Marietta Manned Space Systems, Slidell, LA

Mr. Arthur N. Greene, Director, Program Development, E'Prime Aerospace Corporation, Titusville, FL

4. CORABI TELEMETRICS INTERNATIONAL
Dr. Ronald S. Weinstein, M.D., Chairman, CORABI Telemetrics

5. THE IMPACT OF THE UNIVERSITY ON CORPORATE, REGIONAL, AND STATE COMMERCIAL SPACE DEVELOPMENT
Dr. J. Bruce Rafter, Acting Executive Director, Space Research Institute, Florida Institute of Technology, Melbourne, FL

6. RANTECK: THE COMPANY
Mr. William K. Vardaman, Ranteck, Huntsville, AL

SPAC E CONGRESS BANQUET
Howard Johnson Plaza-Hotel

Cocktails: 7:00 p.m. to 8:00 p.m.
Banquet: 8:00 p.m.

Introductions: Mr. Lyle Holloway
Mr. C. M. Giesler

Spotlight Speaker: Bob Martinez, Governor of the State of Florida
Featured Speaker: To be announced.

Bob Martinez was inaugurated as Florida's 40th Governor on January 6, 1987, ushering in a new era in state government. Florida's first Governor of Hispanic descent and just the second Republican chief executive since Reconstruction, he became the leader of one of the nation's fastest growing and most dynamic states.

His election as Governor continued a lifetime of community involvement and public service that included two terms as Mayor of his native city of Tampa and important roles in local, state and federal organizations. He brought with him to the Governor's Mansion a diverse background that included experience as a public school teacher, labor negotiator and small business owner, in addition to his extensive public service.

In a state in which Republicans are in the minority, he was elected with 54.5 percent of the vote. He immediately began work on his pledge to effectively manage state government, to cut waste and streamline agencies, to boost Florida's economy, and to meet the challenge of unprecedented growth that increases Florida's population by almost 900 people each day.

When he took office, Bob Martinez inherited an overcrowded prison system, a drug-fueled crime problem, widespread problems in dealing with the nation's third-highest incidence of AIDS, and environmental issues associated with Florida's urban areas.

Governor Martinez perceived early a problem of great economic and social impact on Florida. The apprehension surrounding recent trends in space transportation led him to begin efforts to assure Florida's continued growth in Aerospace business, through many facets of his "Spaceport Florida" initiative.

WEDNESDAY, APRIL 26, 1989

PANEL SESSION II (8:30 a.m. to 11:30 a.m.)
Howard Johnson Plaza-Hotel

DEPARTMENT OF DEFENSE SPACE PROJECTS

Session Chairman: Lt. Gen. Donald L. Cromer, Commander, Space Division, Los Angeles AFB, CA
Session Organizer: Captain Gary Spirkak, 8555 ASTG, Cape Canaveral AFS, FL

MEMBERS:
Rear Admiral David Frost, Commander, Naval Space Command, Dahlgren, VA
Up until February of this year, Lt. General James A. Abrahamson was director of the Strategic Defense Initiative Organization, Office of the Secretary of Defense, Washington, D.C. He was responsible to the president and the secretary of defense for managing, directing and selecting key research and development programs designed to eliminate the threat posed by strategic nuclear ballistic missiles and to increase the contribution of defensive systems to U.S. and allied security. In carrying out this mission, he provided overall policy direction and supervision for the conduct of research and development programs associated with the Strategic Defense Initiative Organization mission as well as oversight of the acquisition process for all Strategic Defense Initiative program requirements. In concert with the Joint Chiefs of Staff and under secretary of defense for policy, he also was responsible for the review and development of strategy and policy implications of defensive capabilities.

General Abrahamson was born May 19, 1933, in Williston, N.D. He earned a bachelor of science degree in aeronautical engineering from the Massachusetts Institute of Technology in 1955 and a master of science degree in the same field through the Air Force Institute of Technology program at the University of Oklahoma in 1961. He completed Squadron Officer School in 1958, Air Command and Staff College in 1966 and the Industrial College of the Armed Forces in 1973. The general graduated from Air Command and Staff College as a distinguished graduate in July 1966. He then attended the Aerospace Research Pilot School at Edwards Air Force Base, Calif., and, upon graduation, served as an astronaut with the Air Force's Manned Orbiting Laboratory Program from August 1957 until it was canceled in June 1969.

In March 1974 General Abrahamson was assigned as inspector general, Air Force Systems Command, Andrews Air Force Base, Md. From May 1976 to July 1980 he served as director for the F-16 Multinational Air Combat Fighter Program, Aeronautical Systems Division, Wright-Patterson Air Force Base. He then became deputy chief of staff for systems at Air Force Systems Command headquarters.

In November 1981 the general was assigned as associate administrator for the Space Transportation System, Headquarters National Aeronautics and Space Administration, Washington, D.C. He was responsible for the nation's space shuttle program, leading it safely and successfully through 10 developmental and early operational launches. During his tenure, NASA performed many firsts, including the first satellite retrieval and repair mission that vividly demonstrated the operational capabilities of the space shuttle. He assumed these duties in April 1985.

The general is a command pilot with more than 3,000 flying hours. His military decorations and awards include the Distinguished Service Medal, Legion of Merit with two oak leaf clusters, Meritorious Service Medal, Air Medal with one oak leaf cluster, Air Force Commendation Medal, NASA Distinguished Service Medal, Order of King Olaf of Norway, Order of the Dutch Lion from the Netherlands and the Order of King Leopold of Belgium. He also wears the Space Badge and Command Missile badge. General Abrahamson has received honorary doctorate degrees in engineering from New York University, Utah State University and Rensselaer Polytechnic Institute. In 1984 he received the General Bernard A. Schriever Award for outstanding achievement in support of Air Force missile and space programs. In 1985 he received the Dr. Robert H. Goddard Trophy for leadership and excellence in advancing space flight programs contributing to United States leadership in astronautics. In 1987 he was named the Year in Science and Technology from the Achievement Rewards for College Scientists Foundation, Metropolitan Chapter, Washington, D.C.

He was promoted to lieutenant general July 21, 1982, with same date of rank.

General Abrahamson is married and has five children.
**LUNCHEON** (12:00 noon to 1:30 p.m.)
Holiday Inn, Manatee Room

*Special Informal Reunion Manned Spacecraft Center/Florida Operations, contact Tom Curry, (407) 799-0090.

**Introductions:**
Mr. Lyle Holloway
Mr. C. M. Giesler

**Speaker:**
Cosmonaut Valentin V. Lebedev

Valentin Vitalyevich Lebedev was born April 14, 1942 in Moscow, U.S.S.R. He graduated from the Moscow Aviation Institute in 1966 and has since earned the degree, Doctor of Technical Sciences. He is an active Pilot-Cosmonaut, and was twice decorated Hero of the Soviet Union.

He made his first mission to space in December 1973 as flight engineer aboard the spacecraft Soyuz-13. This mission lasted eight days.

Lebedev's second mission began when he and Anatoly Berezovoy lifted off on May 13, 1982 in the Soyuz T-5 spacecraft for a longer space journey aboard Salyut-7 space station. Lebedev was flight engineer aboard Soyuz T-5. While on the space station, he performed a two-hour EVA, completed over 300 medical and technical experiments and took over 20,000 photographs from orbit. Also his crew was visited by Svetlana Savitskaya, first woman to walk in space, and by Jean-Loup Creteil, the French astronaut trained by both NASA and the USSR.

He is author of the book "Diary of A Cosmonaut: 211 Days in Space," available now in English translation.

Lebedev lives in Moscow with his wife Ludmila and his son Vitaly.

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

**A. SPACE AND THE OPERATIONAL COMMANDER**
Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

**Session Chairman:** Col. Dominick Martinelli, Space Division Chief of Staff, Los Angeles, CA
**Session Organizer:** Capt. Gary Spirnak, 6555th Aerospace Test Group, Patrick AFB, FL

1. **USES OF ON-ORBIT REFUELING AND REFUELING SYSTEMS OPTIONS FOR AIR FORCE SATELLITES**
   Lt. Thomas Utsch, Air Force Systems Command Space Division, Office of Deputy for Plans and Advanced Programs, Los Angeles AFB, CA

2. **SATISFYING USER REQUIREMENTS - SPACE AND THE OPERATIONAL COMMANDER**
   Capt. Nancy M. McMahan, Chief, Program Requirements, DSCS Program Office, Space Division, Los Angeles AFB, CA

3. **POTENTIAL USE OF SMALLER SATELLITES FOR MILITARY SPACE OPERATIONS**
   2Lt. Dennis Montera, Air Force Systems Command Space Division, Office of Deputy for Plans and Advanced Programs, Los Angeles AFB, CA
   1Lt. Thomas Utsch, Air Force Systems Command Space Division, Office of Deputy for Plans and Advanced Programs, Los Angeles AFB, CA

**B. COMMERCIAL SPACE TRANSPORTATION**
Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

**Session Chairman:** Mr. Norman C. Bowles, Associate Director for Licensing Programs, Office of Commercial Space Transportation, Department of Transportation (DOT), Washington, D.C.
**Session Organizer:** Mr. Jerry Vick, Space Station Support Office, Payload Management and Operations Directorate, NASA, KSC

1. **THE U.S. COMMERCIAL LAUNCH SERVICES INDUSTRY AND INTERNATIONAL COMPETITION**
   Dr. Lee R. Scherer, General Dynamics Commercial Launch Services
   Mr. Dennis R. Dunbar, General Dynamics Commercial Launch Services

2. **COMMERCIAL LAUNCH SERVICES - THE KEY TO THE CAPITAL MARKETS FOR SPACE PROJECTS**
   Ms. Dee Ann Divis, Manager, Washington Operations, Third Millennium, Inc.

3. **THE ROLE OF THE DELTA ROCKET IN AMERICA'S SPACE FUTURE**
   Mr. Robert S. Cowls, Director, Commercial Programs, Delta/Delta II, McDonnell Douglas Space Systems Company

4. **A REUSABLE COMMERCIAL SPACE TRANSPORT IN A WORLD OF EXPENDABLES: DEVELOPMENT, CERTIFICATION AND OPERATION**
   Mr. Gary C. Hudson, President, Pacific American Launch Systems, Inc.
   Mr. Maxwell W. Hunter, II, Consultant, Pacific American Launch Systems, Inc.

5. **THE PEGASUS AIR-LAUNCHED SPACE BOOSTER**
   Mr. Robert E. Lindberg, Director, Advanced Projects, Orbital Sciences Corp.

6. **THE SELECTION OF A LAUNCH VEHICLE**
   Mr. Joel S. Greenberg, President, Princeton Synergetics, Inc.
   Ms. Carissa B. Christensen, Policy Analyst, Princeton Synergetics, Inc.

**C. TECHNOLOGY BENEFITS**
Holiday Inn, Manatee Room

**Session Chairman:** Mr. Bill Rock, Manager, Advanced Projects, Technology and Commercialization Office, NASA, KSC
**Session Organizer:** Ms. Tina Phillips, Advanced Projects, Technology and Commercialization Office, NASA, KSC

1. **SPACE STATION AS A BRIDGE TO FUTURE MISSIONS**
   Dr. Robert J. Sirko, McDonnell Douglas Astronautics Company
   Dr. Robert M. Wood, McDonnell Douglas Astronautics Company

2. **OPTICAL ALIGNMENT MEASUREMENT OF SPACE SHUTTLE TILES**
   Ms. Rebecca L. Welling, Lockheed Missiles and Space Company
   Dr. Rick A. Williams, Lockheed Missiles and Space Company
   Dr. Edward D. Huber, Lockheed Missiles and Space Company

3. **AEROSPACE HYDROGEN TECHNOLOGY AND ITS POTENTIAL IMPACT ON A 21ST CENTURY GLOBAL HYDROGEN ECONOMY**
   Dr. Joseph A. Angelo, EG&G, Inc.
   Dr. Ronald G. Barile, Florida Institute of Technology

4. **INTRODUCING NEW TECHNOLOGIES INTO SPACE STATION SUBSYSTEMS**
   Ms. Cindy L. Mollakarimi, Lockheed Space Operations Company
   Dr. Michael J. Wiskerchen, Stanford University

5. **HEAT PIPES FOR LOW-HUMIDITY APPLICATIONS**
   Mr. Mukesh K. Khattar, Florida Solar Energy Center

6. **FLORIDA COMMERCIAL SPACE INITIATIVES AND TECHNOLOGY TRANSFER MECHANISMS**
   Dr. Roger L. Moore, University of Central Florida
EXHIBIT CENTER COCKTAIL RECEPTION
(6:00 p.m. to 7:30 p.m.)
Hilton, Cocoa Beach

THURSDAY, APRIL 27

PANEL SESSION III (8:30 a.m. to 11:30 a.m.)
Howard Johnson Plaza-Hotel

SPACE STATION PROGRAM

Session Chairman: Mr. James B. Odom, Assoc. Administrator for Space Station, NASA Headquarters, Washington, D.C.
Session Organizers: Mr. Daniel H. Herman, Senior Engineer, Office of Space Station, NASA Headquarters, Washington, D.C.
Mr. J. Robert (Bob) Gunter, Technical Assistant, KSC Space Station Project Office, FL

MEMBERS:

Mr. E. Ray Tanner, Director, Space Station Freedom Program, Reston, VA
Mr. John M. (Mike) Lounge, NASA Astronaut, JSC
Dr. Robert J. Gurney, Head, Hydrological Science Branch, GSFC, Greenbelt, MD
Dr. Franklin D. Lemkey, Senior Consulting Scientist, United Technology Research Center, East Hartford, MA
Dr. Jack L. Kerrebrock, Associate Dean of Engineering, MIT, Cambridge, MA
Dr. Franklin D. Martin, Assistant Administrator for Exploration, NASA, Washington, D.C.

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

A. THE INTERNATIONAL ASPECT OF SPACE STATION
Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairman: Mr. William K. Stephenson, Acting Director, International Programs Group, Space Station Program Office, Reston, VA
Session Organizer: Ms. Terese Kozmoski, Space Station Project Office, NASA, KSC

1. SYSTEMS DESCRIPTION OF MOBILE SERVICING SYSTEM (MSS) FOR SPACE STATION FREEDOM
Dr. Andrew S. Jones, Deputy Director, Canadian Space Station Program
Mr. V. K. Agarwal, Systems Engineering, Canadian Space Station Program
Mr. R. Hayes, APM Design and Development, Canadian Space Station Program, Remote Manipulator Systems Division, Spar Aerospace Limited, Toronto, Canada

2. EUROPE'S INVOLVEMENT IN THE INTERNATIONAL SPACE STATION
Mr. F. A. Longhurst, European Space Agency, The Hague in the Netherlands
Mr. G. R. Bolton, European Space Agency, The Hague in the Netherlands

3. JAPANESE EXPERIMENT MODULE: MULTIPURPOSE RESEARCH AND DEVELOPMENT LABORATORY
Dr. Takehiko Kato, Director, Washington Liaison Office, National Space Development Agency of Japan

4. INTERNATIONAL UTILIZATION AND OPERATIONS
Mr. Stanley R. Goldberg, Deputy Director, Program Utilization and Operations Group, NASA Space Station Freedom Program, Reston, VA

5. SPACE STATION FREEDOM SAFETY PROGRAM
Mr. John G. Griggs, III, Chief, Safety Division, Safety/Product Assurance Office, NASA Space Station Freedom Program, Reston, VA

B. EXPLORATION MISSIONS - LUNAR AND MARS
Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: Mr. Jim Underwood, Director of Mission Studies, Office of Exploration, NASA, Reston, VA
Session Organizer: Mr. Dennis Matthews, Advanced Projects, Technology and Commercialization Office, NASA, KSC

1. STATUS OF OFFICE OF EXPLORATION FY89 STUDIES
Mr. Uriah Lovelace, Office of Exploration, NASA, HQ

2. A LUNAR ORBITING NODE IN SUPPORT OF MISSIONS TO MARS
Mr. A. Butterfield, The Bionetics Corporation
Dr. L. Bernard Garrett, Spacecraft Analysis Branch, NASA, LaRC

3. A TRANSPORTATION SYSTEM FOR A LUNAR BASE
Mr. Andrew J. Petro, NASA, JSC

4. POTENTIAL EUROPEAN INVOLVEMENT IN THE U.S. PATHFINDER PROGRAM
Mr. Rudi G. Reichert, Dornier System GmbH

5. THE PROSPECTOR'S PROPOSAL: RESEARCH ADVANCING SURVIVABILITY THROUGH RESOURCE OPTIONS
Mr. Devon C. Walters, et al., United States Air Force Academy

6. SOLAR SAIL TECHNOLOGY FOR MANNED MARS EXPLORATION
Mr. John Garvey, McDonnell Douglas Astronautics Company

C. STATE INITIATIVES IN SPACE
Holiday Inn, Manatee Room

Session Chairman: Mr. Stephen L. Morgan, President, Synergistics Communications Company, Inc., Orlando, FL
Session Organizer: Mr. Bob Mellor, Lockheed Space Operations Co., KSC, FL

1. "SPACEPORT FLORIDA" AND OTHER STATE-SPONSORED SPACE DEVELOPMENT PROGRAMS IN FLORIDA
Dr. Chris Shove, Director, Office of Space Programs, Florida Department of Commerce, Tallahassee, FL

2. A SPACEPORT FOR CAPE YORK - AN INITIATIVE OF THE STATE OF QUEENSLAND
Mr. Mick Borzi, O. B. E., Commissioner, Queensland Government Office, Los Angeles, CA

3. ACTIVITIES, PLANS AND PROGRAMS OF THE FLORIDA SPACE RESEARCH FOUNDATION
Dr. David Webb, Resident Scholar, Space Research Foundation, Orlando, FL

4. SPACE INDUSTRY DEVELOPMENT INITIATIVES IN VIRGINIA
Mr. Michael W. Miller, Program Director, Center for Innovative Technology, Herndon, VA

5. HAWAII'S INITIATIVES IN SPACE
Mr. Harry Foden, Vice President, Arthur D. Little, Inc., Cambridge, MA

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
Session Chairman: Lt. Gen. Forrest S. McCartney, USAF Retired, Center Director, NASA, KSC, FL
A panel open to the general public with several astronauts and payload specialists discussing present and future activities for men and women in space.
Science Fair Winners will be presented awards.
Astronauts John M. "Mike" Lounge and Charles F. (Charlie) Bolden, Jr., and Dr. Mae Jemison are expected to be present.

FRIDAY, APRIL 28
PANEL SESSION V (8:30 a.m. to 11:30 a.m.)
Howard Johnson Plaza-Hotel

DOD LAUNCH RESPONSIVENESS
Col. Vito J. Pagano, Director, Space Systems, DCS/Plans, Headquarters, AF Space Command, Peterson AFB, CO
Session Organizer: Capt. Gary Spirnak, 6555 ASTG, Cape Canaveral AFS, FL

MEMBERS:
Col. Lester L. Lyles, Asst. Deputy Commander for Launch Systems, Space Division, Los Angeles AFB, CA
B/G (selectee) Jean E. Caylor, Deputy Commander for Communications, Operations Support, and Control Systems, Space Division, Los Angeles AFB, CA
Col. Jack R. Worthington, Program Director, Advanced Launch Systems, Space Division, Los Angeles AFB, CA

PAPER SESSION IV (12:45 p.m. to 3:45 p.m.)
A. LAUNCH RESPONSIVENESS
Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairman: Col. William S. Files, Jr., Deputy Program Director, Titan IV System Program Office, Deputy Commander for Launch Systems, Space Division, Los Angeles, CA
Session Organizer: Capt. Gary Spirnak, 6555th Aerospace Test Group, Patrick AFB, FL

1. OPTIMUM MILITARY SPACE FORCE STRUCTURE CHARACTERISTICS
Lt. Col. Owen E. Jensen, Deputy Director, Space Systems DCS/Plans HQ Air Force Space Command

2. WIND MEASUREMENTS BY ELECTROMAGNETIC PROBES
Dr. Michael Susko, Science and Engineering Directorate, NASA, MSFC

3. COMMON INTERFACES
Dr. James K. Yakura, Aerospace Corporation
Dr. Dianne K. Sakaguchi, Aerospace Corporation
Mr. Richard P. Toutant, Aerospace Corporation

B. SPECIAL TOPICS
Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairman: Mr. Don Capone, Donald J. Capone Consulting Services, Inc., Cocoa Beach, FL
Session Organizer: Mr. Ned Wagnon, Engineering Development Directorate, NASA, KSC

PROGRAM SUMMARY

MONDAY, April 24
ARMED FORCES COMMUNICATION ELECTRONICS ASSOC. SPECIAL LUNCHEON PROGRAM
12:00 noon to 5:00 p.m.
REGISTRATION DESK OPEN
Holiday Inn Dolphin Room

TUESDAY, April 25
7:00 a.m. to 5:00 p.m.
8:30 a.m.
9:00 a.m. to 11:30 a.m.
11:00 a.m. to 7:00 p.m.
10:00 a.m. to 7:00 p.m.
12:00 noon to 1:30 p.m.
REGISTRATION DESK OPEN
Holiday Inn Dolphin Room
KEYNOTE ADDRESS
Howard Johnson Plaza-Hotel
PANEL SESSION I - NATIONAL SPACE TRANSPORTATION SYSTEM
Howard Johnson Plaza-Hotel
YOUTH SCIENCE FAIR
Holiday Inn Dolphin Room
EXHIBITS
Hilton Convention Center
MEET THE PRESS PANEL
Holiday Inn Manatee Room
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<th>Time</th>
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| 2:00 p.m. to 5:00 p.m. | PAPER SESSION I: A. NSTS - THE NEXT GENERATION  
Howard Johnson Plaza-Hotel  
B. NATIONAL SPACE PROGRAMS  
Howard Johnson Plaza-Hotel  
C. SPACE ENTERPRISE DEVELOPMENT  
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 26 | REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room |                                |
| 7:00 a.m. to 5:00 p.m. | PANEL SESSION II - DOD SPACE PROJECTS  
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 1:45 p.m. | SPACE CONGRESS LUNCHEON  
Holiday Inn Manatee Room |                                |
| 2:00 p.m. to 5:00 p.m. | PAPER SESSION II: A. SPACE AND THE OPERATIONAL COMMANDER  
Howard Johnson Plaza-Hotel  
B. COMMERCIAL SPACE TRANSPORTATION  
Howard Johnson Plaza-Hotel  
C. TECHNOLOGY BENEFITS  
Holiday Inn Manatee Room |                                |
| 6:00 p.m. to 7:30 p.m. | EXHIBIT CENTER COCKTAIL RECEPTION  
Hilton Convention Center |                                |
| THURSDAY, April 27 | REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room |                                |
| 7:00 a.m. to 5:00 p.m. | PANEL SESSION III - SPACE STATION PROGRAM  
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. THE INTERNATIONAL ASPECT OF SPACE STATION  
Howard Johnson Plaza-Hotel  
B. EXPLORATION MISSIONS - LUNAR AND MARS  
Howard Johnson Plaza-Hotel  
C. STATE INITIATIVES IN SPACE  
Holiday Inn Manatee Room |                                |
| 6:00 p.m. to 8:00 p.m. | SPACE CONGRESS RECEPTION  
Holiday Inn Observation Deck |                                |
| 7:00 a.m. to 9:30 a.m. | PANEL SESSION IV - MEET THE ASTRONAUTS  
Howard Johnson Plaza-Hotel |                                |
| FRI, May 28 | REGISTRATION DESK OPEN  
Holiday Inn Dolphin Room |                                |
| 7:00 a.m. to 12:00 noon | PANEL SESSION V - DOD LAUNCH RESPONSIBILITIES  
Howard Johnson Plaza-Hotel |                                |
| 11:30 a.m. to 5:00 p.m. | SPACE CONGRESS GOLF TOURNAMENT  
Patrick Air Force Base Golf Course |                                |
| 12:45 p.m. to 3:15 p.m. | PAPER SESSION IV: A. LAUNCH RESPONSIVENESS  
Howard Johnson Plaza-Hotel  
B. SPECIAL TOPICS  
Howard Johnson Plaza-Hotel |                                |
| 7:00 p.m. to 10:00 p.m. | MISSILE, SPACE AND RANGE PIONEERS' ANNUAL BANQUET  
Patrick Air Force Base, Officer's Open Mess |                                |

ACKNOWLEDGEMENTS

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