1983 Twentieth Space Congress Program

Canaveral Council of Technical Societies
CHAIRMAN’S MESSAGE

The theme of the TWENTIETH SPACE CONGRESS is SPACE—THE NEXT TWENTY YEARS—and two decades after the first United States manned orbital flight seems an appropriate time to review the solid accomplishments of the space program, and project its most likely course as we move toward the next century.

The history of spaceflight spans barely a quarter-century, a very short time span for an incredible amount of progress in space exploration and utilization. This was brought home to me last year during a trip to Washington D.C., when I visited the Smithsonian National Air and Space Museum. In the Space Hall, and the Rocketry and Space Flight Exhibits, I viewed the systems of the past, and an exhibit called “Toward 2076: The Future of Rocket Propulsion.” These show clearly that the future, as always, will be vastly different from the past.

To date, all major space transportation systems have been powered by solid or liquid chemical rockets. In the future, small nuclear-powered rocket systems may provide much longer burn times and hence more overall powerful vehicles. Electrical propulsion systems employing electrostatic or magnetic forces to accelerate small quantities of propellants, operating for weeks or even months at a time, can achieve velocities that are very expensive to obtain with rockets that burn for only a few minutes. Both are radical departures from current technology, and both—or neither—may be the wave of the future.

The one fact of which we can be certain is that the process of constant change will continue, and bring many surprises in its wake. Those people who take reasoned, analytical looks at future possibilities and potentials, in symposiums such as the SPACE CONGRESS, will suffer less "future shock" than most. And they will be more able to take advantage of the limitless possibilities now opening up before us.

These three days will allow all of us to share the thoughts and ideas of prominent thinkers from industry, government (both civil and military), and education. We will hear stimulating panel discussions dealing with the lessons of the past and the complexities of the future. A high school science fair will be held in conjunction with the SPACE CONGRESS, featuring exhibits from some of today’s bright young students. Several leading aerospace companies also plan to have exhibits available.

Our agenda calls for a number of social activities, including a banquet at the Patrick AFB Officers Open Mess, a luncheon, and other functions hosted by symposium attendees. Family members may enjoy Florida attractions listed elsewhere in this brochure.

The staff and workers will be glad to assist you in making the Congress both informative and pleasant.

Al Reeser,
Chairman, Twentieth Space Congress
GENERAL INFORMATION

HEADQUARTERS/REGISTRATION

Headquarters for the Twentieth Space Congress is the Holiday Inn, Cocoa Beach. Registration will take place in the Dolphin Room from noon to 6:00 p.m. Monday, April 25, 1983. Registration will continue from 7:00 a.m. to 5:00 p.m. onTuesday and Wednesday, and from 8:00 a.m. to 1:00 p.m. on Thursday.

The Tuesday Space Congress Banquet has been sold out, but the following items are available as a package for $50.00.

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<tr>
<th>Package</th>
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<tr>
<td>PACKAGE REGISTRATION</td>
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<td>(Includes three items listed below)</td>
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<tr>
<td>Thursday Luncheon</td>
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<td>Bound Copy of Proceedings</td>
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<td>Sessions</td>
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This package registration will save you money, however, each item may be purchased individually at the listed price. Individual papers in the proceedings will be available at a cost of $.10 cents per page.

PRESS ROOM

Press headquarters is in the Pelican Room of the Holiday Inn and is staffed and directed by Melodie de Guibert 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. The telephone number in the press headquarters is (305) 784-6925.

MESSAGE CENTER

A message center will be located in the lobby of the Holiday Inn. Messages and telephone calls will be placed on a message board in the lobby. During the Congress hours, calls to this center should be placed to (305) 784-6924. After session hours, calls can be made to the Holiday Inn operator at (305) 783-2271.

AUTO RENTALS

Reservations and rentals can be made at Cocoa Beach or at the Melbourne and Orlando airports. Agencies include:

- AVIS
- NATIONAL
- BUDGET
- HERTZ

ATTRACTION CENTERS

Late April in Central Florida is a delightful time of the year for the entire family. The weather is usually mild, the Atlantic warm enough for swimming and the tourist attractions are not yet crowded. Cocoa Beach offers a long stretch of swimming and walking beach, surfing areas, and both deep-sea and shore fishing. Bus tours of The Kennedy Space Center and Cape Canaveral Air Force Station are available from the KSC Visitors Center. This is a free, exhibit-filled space museum which can be enjoyed by the entire family, including relatively small children. Within one or two hours drive are—a world of vacation fun in the Magic Kingdom of Walt Disney World, including the new attraction EPCOT, The Experimental Prototype Community of Tomorrow—Sea World, one of America's finest marine attractions—Circus World, where you can perform instead of just watch—the mystery and excitement of Africa in Busch Gardens—the famed glass bottom boats at Silver Springs—the beautiful, recently enlarged gardens and daily water ski review at Cypress Gardens—and many other lesser-known attractions.

PROCEEDINGS

The proceedings of the Twentieth 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 $35.00 each plus postage from:

- Secretary, CCTS
- Post Office Box 245
- Cape Canaveral, Florida 32920

EXHIBITS

Exhibits will include displays of the Space Shuttle, Shuttle payloads, ground support systems, and communications satellites.

The exhibit hall will be open from 11:00 a.m. to 7:30 p.m. on Tuesday, from 11:00 a.m. to 7:45 p.m. on Wednesday, and from 9:00 a.m. to 1:00 p.m. on Thursday. Representatives of the exhibits will be in attendance to assist and inform visitors. The exhibit hall is located at the Crossway Inn, 3901 N. Atlantic Ave. (A1A) Cocoa Beach.

The general public is invited to view the exhibits. A free Shuttle Bus is available from the registration area, Holiday Inn, to the exhibit area every 30 minutes.

EXHIBITORS

- Brevard Community College
- The Boeing Company
- Canaveral Council of Technical Societies
- Computer Sciences Corporation
- EG&G, Florida
- Florida Institute of Technology
- IBM
- ILC Dover
- Kodak
- Lockheed
- McDonnell Douglas Astronautics Company
- Northrop Services, Inc.
- Planning Research Corporation
- Rockwell International Corporation
- The Space Coast Tourism Committee
- Thiokol Corporation
- TRW
- United Technologies Corporation
- Wyle Laboratories

YOUTH SCIENCE FAIR

Science fair displays and demonstrations from local secondary school students will be open to the public from 7:00 a.m. to 7:30 p.m., on Tuesday and Wednesday, April 26 and 27, 1983. The Thursday schedule is from 8:00 a.m. to 2:30 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 12:30 p.m. on Wednesday, April 27. The awards will be presented to the winners at the 8:00 p.m. "Meet the Astronauts" panel session to be held at the Cocoa Beach Theater on Wednesday.

PIONEERS' DAY

The Pioneers Banquet '83 will be held on Friday, April 29 at the Officers Open Mess, Patrick Air Force Base on the following schedule:
TWENTIETH SPACE CONGRESS PROGRAM
TUESDAY, APRIL 26

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

Introduction: Mr. Al Reeser
Speaker: Congressman Bill Nelson

Bill Nelson, mentioned as one of the outstanding young men in America in 1972, represents the 9th Congressional District of Florida in the United States House of Representatives.

Bill was elected to the 96th Congress in November 1978 with 62% of the vote and subsequently re-elected in 1980 with 71% of the vote. He serves as a member of the Budget Committee and the Science and Technology Committee. Prior to his national service, he combined the practice of law with an active career in state and local public service and in the civic and religious life of his community.

He attended the public schools of Brevard County and graduated from Melbourne High School in 1960. At Yale University, he graduated as class orator with a Bachelor of Arts Degree. He received a Juris Doctor Degree from the University of Virginia School of Law, and was admitted to the Florida Bar in 1968.

Bill was a Captain in the United States Army Reserve, where he served from 1965 to 1971, and was on active military duty from 1968 to 1970.

He was elected to the first of three terms in the Florida House of Representatives in 1972 and was elected subsequently without any opposition.

He is a member of the Kiwanis Club, the Jaycees, and is an entered apprentice Mason. He and his family attend the Tabernacle Church in Melbourne and the National Presbyterian Church in Washington.

Bill has been honored by the Florida Jaycees as one of the Five Outstanding Young Men of Florida in 1975 and nominated as the most valuable member of the Florida House of Representatives in 1976. Two Florida colleges have conferred upon him honorary degrees—a Doctor of Laws from Rollins College and a Doctor of Science from Florida Institute of Technology.

He is married to the former Grace Caverl of Jacksonville. They have two children: Billy, age 7, and Nan Ellen, age 6.
C. ORBITAL OPERATIONS
Brassy's

Session Chairperson: Mr. Mac R. Morrison, Lab Manager, Test and Field Operations Division, TRW, Redondo Beach CA
Session Organizer: Mr. Robert S. Kreisberg, Project Engineer, Space Systems Operations Engineering Department, TRW, Redondo Beach, CA

1. Space Nuclear Power and Man's Extraterrestrial Civilization
Dr. Joseph A. Angelo, Jr., Chairman, Space Technology Program, Florida Institute of Technology, Melbourne, FL
AND
Mr. David Buden, Program Manager, Los Alamos National Laboratory, Los Alamos, NM

2. Satellite Servicing Technology Development Missions
Mr. Robert Middleton, Aerospace Engineer — Program Development, NASA—MSFC, Huntsville, AL
AND
Mr. Donald Waltz, Advanced Projects Manager, Test and Field Operations Division, TRW, Redondo Beach, CA
AND
Mr. Sherman Schrock, Manager, Space Station, Martin Marietta Aerospace, Denver, CO

3. Shuttle Remote Manipulator System and its use in Orbital Operations
Mr. Savi S. Sachdev, Manager, Systems, Controls and Analysis Engineering, RMS Division, Spar Aerospace Limited, Toronto, Canada
AND
Mr. Brian R. Fuller, Manager, RMS Marketing, RMS Division, Spar Aerospace Limited, Toronto, Canada

4. Network Operations with Tracking and Data Relay Satellite System
Mr. Robert E. Spearing, Deputy Project Manager/Ground, TDRSS Project, NASA—GSFC, Greenbelt, MD
AND
Mr. David Perreten, Operations Manager, TDRSS Project, NASA—GSFC, Greenbelt, MD

5. Satellite Deployment from the Space Shuttle
Dr. William B. Lenoir, NASA Astronaut, NASA—JSC, Houston, TX

Dr. George E. Mueller, Senior Vice President of Burroughs Corporation and Chairman and Chief Executive Officer of System Development Corporation — A Burroughs Company, was responsible for and directed the United States manned space flight program from the beginning of Gemini flight operations through the second Apollo moon landing. As Associate Administrator for Manned Space Flight at NASA, the Marshall Space Flight Center, Manned Spacecraft Center, and the John F. Kennedy Space Center reported to him along with the Apollo, Gemini, Apollo Applications, and the Advanced Manned Missions Offices.

Dr. Mueller left NASA in 1969 to become Vice President of General Dynamics Corporation. Prior to joining NASA, he spent five years with Space Technology Laboratories, Inc., holding successive management positions as Director of the Electronics Laboratories, Vice President of Space Systems Management, and Vice President for Research and Development. In the latter post, he had overall responsibility for technical operations of the company. He also had overall responsibility for design, development, and testing of systems and components basic to Atlas, Titan, Minuteman, and Thor ballistic missile programs; for development of the United States' first successful space probe, Pioneer I; for several other space projects including Explorer VI and Pioneer V; and for establishment of the U.S. Air Force tracking network for deep space probes.

His more than 30 years experience includes six years as a researcher with Bell Telephone Laboratories and ten years with the electrical engineering faculty at Ohio State University. He has performed extensive research in electromagnetic theory and application, television, microwaves and microwave antennas, missile guidance systems, deep space communications, systems engineering, and space payload design. He was one of the originators of the concept and design of the Telebit digital telemetry system. He holds seven patents and is the author of more than 40 technical papers. With E. R. Spangler, he is co-author of a book, COMMUNICATION SATELLITES.

Dr. Mueller is President of the International Academy of Astronautics. He is a member of the National Academy of Engineering; a Fellow of the American Institute of Aeronautics and Astronautics (AIAA), the Institute of Electrical and Electronic Engineers, the American Association for the Advancement of Science, the American Astronautical Society, the American Geophysical Union, and the Royal Aeronautical Society; and an Honorary Fellow of the British Interplanetary Society. He is a past vice president of the International Astronautical Federation. He is Past-President of the AIAA. He is a member of the New York Academy of Sciences, the American Physical Society, and many other professional organizations.
He was born in St. Louis, Missouri, on July 16, 1918, and holds a B.S. in Electrical Engineering from Missouri School of Mines, and M.S. in Electrical Engineering from Purdue University, and a Ph.D. in Physics from Ohio State University.

The National Medal of Science was awarded to him by President Nixon in 1970 for his many individual contributions to the design of the Apollo system, including the planning and implementation of a large array of advanced experiments necessary to insure the success of this venture into a new and little known environment. He has received honorary degrees from Wayne State University, New Mexico State University, University of Missouri, Purdue University, Ohio State University and Pepperdine University. His numerous awards include three NASA Distinguished Service Medals, the American Astronautical Society Space Flight Award, the Eugen Sanger Award, the American Academy of Achievement’s Gold Plate Award, and the National Transportation Award for 1979 “Father of the U.S. Space Transportation System,” which referred to his originator of the Space Shuttle.

WEDNESDAY, APRIL 27, 1983
PANEL SESSION II (8:30 a.m. to 11:30 a.m.)
NEXT TWENTY YEARS IN SPACE

Session Chairperson: Dr. Johannes Ortner, Director Austrian Solar and Space Agency, Vienna, Austria and Director Spacelab Program Board, ESA Planning Council.
Session Organizer: Dr. David Flinchaugh, Senior Staff Specialist, McDonnell Douglas Astronautics Co., Titusville, FL.

MEMBERS:
Dr. Hans Hoffman, Director General, ERNO/Geschafstfuhrung Bremen, Fed. Republic of Germany
Dr. Klaus P. Heiss, President, The Space Transportation Company, Inc. Princeton, NJ
Mr. Fred Haise, Vice President, Grumman Aerospace, Bethpage, NY
Dr. Arden L. Albee, Professor of Geology & Planetary Science, Cal Tech and Chief Scientist, JPL Pasadena, CA
Dr. Gerald W. Sharp, Future Aerospace Projects Office, NASA, Kennedy Space Center, FL

PAPER SESSIONS II (1:00 p.m. to 4:00 p.m.)

A. ENERGY APPLICATIONS
Holiday Inn

Session Chairperson: Dr. Robert L. San Martin, Deputy Assistant Secretary for Renewables, U.S. Dept. of Energy, Washington, DC.
Session Organizer: Dr. David L. Block, Director, Florida Solar Energy Center, Cape Canaveral, FL.

1. Kennedy Space Center Polygeneration Facility
Mr. Gary P. Gutkowski, Project Manager; Design Engineering Directorate, Kennedy Space Center, FL

Dr. Robert J. Sprafra, Mr. Raymond R. Tison, and Mr. William J.D. Escher., E:F Technology, Inc. St. Johns, MI

3. Alternative Liquid Fuels for Transportation
Dr. John J. Thomas, Medical Research Institute, Florida Institute of Technology, Melbourne, FL
AND
Dr. Ronald G. Barile, Chemical Engineering Dept., Florida Institute of Technology, Melbourne, FL

4. Fuels of the Future
Mr. Albert M. Momentry, Manager of Transportation Energy, Boeing Commercial Airplane Co., Seattle, WA

5. Photovoltaics Overview
Dr. Gerald G. Ventre, Deputy Director, Florida Solar Energy Center, Cape Canaveral, FL

B. STS CARGOS
Holiday Inn

Session Chairperson: Mr. George V. Butler, Director – Advanced Space Program, McDonnell Douglas Astronautics Co., Huntington Beach, CA.
Session Organizer: Ms. C. Darlene Trudell, Manager, Customer Relations, McDonnell Douglas Astronautics Co., Huntington Beach, CA.

1. Cargo Integration
Mr. George R. Faenza, Director, Kennedy Space Division, McDonnell Douglas Technical Services, Co., Kennedy Space Center, FL.

2. Processing and Deploying the McDonnell Douglas Payload Assist Module (PAM)
Mr. C. E. Bryan, Unit Chief, Electronic Systems Requirements, McDonnell Douglas Astronautics Co., Huntington Beach, CA.
AND
Mr. I. J. Webster, Manager, Mission Integration/Launch, PAM Programs, McDonnell Douglas Astronautics Co., Huntington Beach, CA.

3. Spacelab Program Preparation for the Verification Flights & Projected Utilization
Mr. James C. Harrington, Director of Spacelab Division, NASA – Headquarters, Washington, DC.
AND
Mr. Alfred L. Ryan, Chief, Spacelab Operations, NASA – Headquarters, Washington, DC.

4. Design of the Space Telescope for Deployment and Servicing by the Space Shuttle
Mr. William F. Wright, Vice President, NASA Programs, Space Systems Division, Lockheed Missiles and Space Co., Inc., Sunnyvale, CA.
AND
Mr. Marne L. Mercer, STS Interface Manager, Space Telescope Program, Lockheed Missiles and Space Co., Inc., Sunnyvale, CA.

5. Teleoperator Maneuvering System (TMS) Mission Applications and Benefits
Mr. David C. Cramblit, Chief, Space Systems Group, NASA – MSFC, Huntsville, AL.
AND
Mr. James R. Turner, TMS Study Manager, NASA – MSFC, Huntsville, AL.

6. Future Scientific Missions for STS
Mr. Carmine E. DeSanctis, Chief-Space Science Group, Program Development, NASA – MSFC, Huntsville, AL.

7. Space Transportation System Cargo Abort and Recovery Operations
Dr. Dwight J. Easterly, Staff Engineer, Test and Field Operations Division, TRW, Cape Canaveral, FL.
AND
Mr. L. Ernest Henshaw, Senior Specialist Engineer, Boeing Aerospace Co., Kennedy Space Center, FL.

8. STS Science and Applications Payloads: An Evolving Perspective
Mr. Michael J. Sander, Director Spacelab Flight Division, NASA – Headquarters, Washington, DC.
C. FUTURE SPACE TRANSPORTATION SYSTEMS
Cocoa Beach Theater

Session Chairperson: Mr. Andrew J. Pickett, Associate Deputy Director, NASA-KSC, Kennedy Space Center, FL
Session Organizer: Mr. Thomas A. Feaster, Manager — Advanced Studies, NASA-KSC, Kennedy Space Center, FL

1. U.S. Launch Vehicles for the Future
   Mr. W. R. Marshall, Director, Program Development, NASA—MSFC, Huntsville, AL

2. Second-Generation Space Shuttle
   Mr. James P. Arrington, Head, Vehicle Analysis Branch, Space Systems Division, NASA—LRC, Hampton, VA

3. The Role of the SDV in the STS
   Mr. Vince Caluori, Manager of Preliminary Design, Boeing Space Systems Division, Boeing Aerospace, Co., Seattle, WA

4. The Role Rationale and Economics of a Shuttle Derived Cargo Vehicle
   Mr. Frank L. Williams, Director, Advanced Programs, Martin Marietta Aerospace, Michoud Division, New Orleans, LA
   AND
   Mr. J. Robert Tewell, Manager, Vehicle Systems, Martin Marietta Aerospace, Michoud Division, New Orleans, LA

5. External Tank Aft Cargo Carrier
   Mr. Thomas B. Mobley, ACC Project Manager, Martin Marietta Aerospace, Michoud Division, New Orleans, LA
   AND
   Mr. James E. Hughes, ACC Project Manager, NASA—MSFC, Huntsville, AL

6. Future Requirements and Applications for Orbital Transfer Vehicles
   Mr. Donald E. Charhut, Director, Advanced Space Programs, General Dynamics Convair Division, San Diego, CA
   AND
   Mr. W. J. Ketchum, Project Manager, Orbital Transfer Vehicles, General Dynamics Convair Division, San Diego, CA

PANEL SESSION III (8:00 p.m.)
Cocoa Beach Theater

MEET THE ASTRONAUTS

Session Chairperson: Richard G. Smith, Center Director, NASA John F. Kennedy Space Center, 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.

THURSDAY, APRIL 28

PANEL SESSION IV (8:30 a.m. to 11:30 a.m.)
Cocoa Beach Theater

SPACE TRANSPORTATION SYSTEM UPDATE

Session Chairperson: Mr. Richard H. Kohrs, Deputy Manager, National STS Program Office, NASA, Johnson Space Center, TX
Session Organizer: Mr. Preston E. Beck, NASA-Retired, Satellite Beach, FL

MEMBERS:

Mr. Thomas E. Utsman, Director, Shuttle Management and Operations, NASA, Kennedy Space Center, FL
Mr. Daniel M. Germany, Assistant Manager, Orbiter Project Office, NASA, Johnson Space center, TX
Mr. Leonard S. Nicholson, Manager, Mission Integration, National STS Program Office, NASA, Johnson Space Center, TX
Mr. Enoch Jones, Manager, Systems Integration, National STS Program Office, NASA, Johnson Space Center, TX

LUNCHEON (11:30 a.m.)
Holiday Inn, Cocoa Beach, Manatee Room

Introduction: Al Reeser

Speaker: Isaac T. Gillam IV, Assistant Associate Administrator (Plans and Policy), Office of Space Flight of the National Aeronautics and Space Administration.

From October 1981 to October 1982 Mr. Gillam was Special Assistant to the Administrator for Space Transportation Systems and in that capacity was assigned to the White House Office of Science and Technology Policy to participate in the establishment of the National Space Policy.

From June 1978 to October 1981, he was Director of NASA's Dryden Flight Research Center landing site for Space Shuttle Columbia. Prior to that he was Deputy Director. He was named Director of Shuttle Operations at Dryden in 1976, and served there while Enterprise was going through approach and landing tests.

He joined NASA in 1963 as a Program Management Specialist, and in 1966 was appointed Assistant Program Manager for the Delta Launch Vehicle Program.

Born in Little Rock, Arkansas, Gillam graduated from Howard University in 1953. He served as a U.S. Air Force Pilot in Korea. During his ten years in the Air Force he served as a Missile Launch Crew Commander for SAC and was an Assistant Professor of Air Science at Tennessee State University, where he pursued graduate studies.

Gillam is a Tau Beta Pi, Fellow of the AAS, Associate Fellow of AIAA, and member of the Air Force Association. He is a recipient of NASA’s highest award, the Distinguished Service Medal, two Exceptional Service Medals and numerous Civic and Educational Service awards.

PAPER SESSION III (2:00 p.m. to 5:00 p.m.)
Cocoa Beach Theater

A. SPACE STATION:
   Cocoa Beach Theater

Session Chairperson: Philip E. Culbertson, Associate Deputy Administrator, NASA Headquarters, Washington, D.C.
Session Organizer: Mr. Terrance T. Finn, Deputy Director - Technology Utilization and Industry Affairs, NASA—Headquarters, Washington, D.C.

1. Requirements/Characteristics for Transportation Mode
   Mr. Gerald M. Hanley, Program Manager, Space Station Rockwell International, Downey, CA

2. Requirements/Characteristics for Assembly and Construction
   Mr. Richard L. Kline, Director, Shuttle Applications, Grumman Aerospace, Bethpage, NY

3. Requirements/Characteristics for Satellite Servicing
   Mr. W. R. Marshall, Director, Program Development, NASA—MSFC Huntsville, AL
4. Requirements/Characteristics for Science
Dr. James H. Trainor, Deputy Director, Sciences Directorate NASA—GSFC, Greenbelt, MD

5. Requirements/Characteristics for Commercial Activity
Mr. David C. Wensley, Study Manager, Space Station Program McDonnell Douglas Astronautics Co., Huntington Beach, CA

6. Requirements/Characteristics for Semi-Autonomous "Permanent" Operations
Mr. Clarke Covington, Acting Manager — Space Station Office NASA—JSC, Houston, TX

7. Accommodating Multiple and Possibly Conflicting Requirements and Characteristics
Mr. John D. Hodge, Director — Space Station Task Force NASA—Headquarters, Washington, D.C.

B. GET AWAY SPECIAL FINALISTS
Afterdeck Lounge in Ocean Landings

Session Chairperson: Mr. James A. Ralph, Manager Ground Operations Analysis—IBM, Cape Canaveral, FL
Session Organizer: Mr. Dean C. Zimmerman, Launch Site Support Manager — NASA, Kennedy Space Center, FL

1. Is Diamagnetic Oxygen Present in Space?
Miss Jennifer Keedy, Amherst College, MA

2. X-Ray Examination of Possible QS0 Models
Miss Karen Milewski, Titusville High School, Titusville, FL

3. The Operation of the Solar Powered Stirling Engine in Space
Mr. Jon Ramer, Troy State University, Troy, AL

4. Cancer Observation in Zero G.
Miss Andrea M. Brylanski, Florida Institute of Technology, Melbourne, FL

5. The Effects of a Zero-Gravity Environment on the Crossing Over Mechanism of Yeast Chromosomes: Recombination in Outer Space
Miss Ava Lynn Rhodes, Yale University, New Haven, CT

6. Planaria Regeneration in Zero Gravity
Miss Dena K. Rashkov, Pioneer Middle School, Cooper City, FL

C. SPECIAL TOPICS
Holiday Inn

Session Chairperson: Dr. B. J. Bluth, Professor of Sociology, California State University, Northridge, Granada Hills, CA
Session Organizer: Mr. Roger N. Harmon, Staff Engineer, System Test Engineering Department, TRW, Redondo Beach, CA

1. Design of Microgravity Space Environments to Enhance Crew Health, Morale and Productivity
Dr. Larry Bell, Director, Environmental Center, College of Architecture, University of Houston, Houston, TX

2. Artificial Intelligence and Man in Space
Mr. Gordon Woodcock, Manager, Large Space Systems, Boeing Aerospace Co., Seattle, WA

3. Uncertainty Risk and Investment Decisions
Mr. Joel S. Greenberg, Director, Techno-Economic Analysis, ECON, Inc. Princeton, NJ

Mrs. Jeri W. Brown, Manager, Graphics Analysis Facility, NASA—JSC, Houston, TX

5. A Comparison of Manned and Unmanned Orbital Construction and Maintenance
Dr. Bruce W. Webbon, Senior Research Engineer, SRI International, Menlo Park, CA

CANAVERAL COUNCIL OF TECHNICAL SOCIETIES

Air Force Association
American Institute of Aeroautics 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 Air Conditioning Engineers
American Society for Industrial Security
American Society of Mechanical Engineers
American Society of Photo Optical Instrumentation Engineers
American Society for Quality Control

American Society of Safety Engineers
American Welding Society
Armed Forces Communications Electronics Association
American Society for Training and Development
Coalition of Aerospace Professional Engineers
Florida Engineering Society
Institute of Electrical and Electronic Engineers
Instrument Society of America
Missile, Space and Range Pioneers, Incorporated
National Contract Management Association
Society of Logistics Engineers
Society for Technical Communication

THE MAP BELOW GIVES THE EXACT LOCATION OF EACH ATTRACTION.
TWENTIETH SPACE CONGRESS COMMITTEE

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Rockwell International

VICE CHAIRMAN
Dallas Gillespie
NASA

ASSISTANT TO CHAIRMAN
Florette Haisten
Rockwell International

FINANCE
Dorsey Dean
General Dynamics Convair

PROGRAM CHAIRMAN
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LOCAL ACCOMMODATIONS
Gail Galloway
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LOCAL SUPPORT
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Jim Black
McGregor & Werner, Inc.

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Melodie De Guibert
Martin Marietta Aerospace

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Cocoa Beach, FL

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Janet Bond
PRC Systems Services
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