



Space Congress Programs

4-26-1994

1994 Thirty-First Space Congress Program

Canaveral Council of Technical Societies

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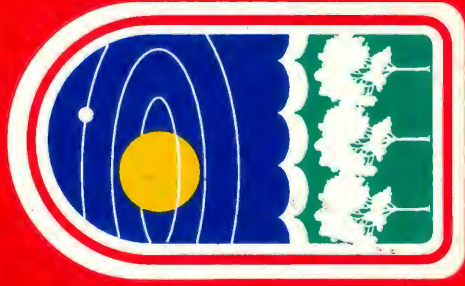
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PROGRAM



Thirty-First Space Congress

Space Exploration and Utilization
for the Good of the World

Cocoa Beach, Florida
April 26, 27, 28, 29, 1994

Chairman's Message



The **Thirty-First Space Congress** represents a shift in focus from our past presentations on space activity. We have structured a program that presents specifics on what is being developed in space and how these developments benefit mankind here on Earth. The theme we have chosen reflects that focus, **"Space Exploration and Utilization for the Good of the World."**

Our intentions are to present discussions that will make the national and international public aware that space exploration is good — good for the individual, good for the economy, and good for improving quality of life throughout the world.

Our program will focus on the impact the space program has had on medicine, such as miniaturization and microgravity research in biological sciences; the impact on geography, such as surveying Earth's resources from space, weather and disaster warning, and navigation. We will also present data on the impact relating to communications and education, and real and potential growth industries. Other sessions will focus on the benefits that are anticipated as we continue to reach out into the universe. In short, we will attempt to provide the public with an overview of how their life has been enriched through efforts in space and space-related activities.

Our four major panel sessions will discuss **Humans Working in Space** and the products of this work; **Systems Working in Space** which are producing cost and quality of life benefits relating to improved products and services; **Dividends derived here On Earth from knowledge gained From Space** exploration and utilization; and **Future Steps in Space** which are anticipated to significantly benefit the people around the world. Technical paper sessions, presented by the investigators who have participated in these space experiments, will expand and expound upon these themes, as will the space-oriented exhibits presented by many of the leading aerospace companies. Additionally, we will motivate our youth through such activities as our very highly successful **Science Fair**, **Space Congress Model contest**, and the **"Meet the Astronauts"** panel.

The Space Congress is sponsored by the Canaveral Council of Technical Societies (CCTS), and is supported by the National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD), as well as the communities and aerospace companies of the space coast.

On behalf of myself and this year's committee, we look forward to sharing our new focus and exciting programs. Welcome to the **Thirty-First Space Congress**, a celebration of Space for the Good of the World.

A stylized, handwritten signature in black ink, consisting of several loops and a long horizontal stroke at the end.

G. R. Faenza
General Chairman
Thirty-First Space Congress

Information

Headquarters/Registration

Headquarters for the **Thirty-First 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 25, 1994. 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 12:00 a.m. on Friday.

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

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

Press Room

The press facility is located in the Skylab Room of the Howard Johnson Plaza-Hotel. The press facility is staffed and directed by Gail Galloway and Bob Tucker from 12 noon to 5:00 p.m. on Monday and from 8:00 a.m. to 5:00 p.m. on Tuesday, Wednesday and Thursday and 8:00 a.m. to noon on Friday. The telephone number for the press facility is (407) 868-2146 (fax: 868-2345).

Message/Locator Assistance

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

Proceedings

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

Exhibits

Exhibits will include a Showcase Exhibit, computer graphics demonstrations and displays of the Space Shuttle, Shuttle Payloads, Space Station, Expendable Launch Vehicles, and other space related activities. The Exhibit Halls will be open to the public in the Cocoa Beach Hilton and the Comfort Inn & Suite Resort, on the following schedules:

Tuesday - 11:00 a.m. to 7:00 p.m.; Wednesday - 11:00 a.m. to 8:00 p.m.; and Thursday - 9:00 a.m. to 3:00 p.m.

Exhibitors

ADC Government Operations
Analex Space Systems Inc.
Astronaut Awareness
BAMSI, Inc.
The Bionetics Corporation
Boeing Aerospace and Electronics
Boggs Specialty Gasses
Brevard Community College
Brevard Technical Journal
Cincinnati Electric
Communications Concepts, Inc.
Computer Science Raytheon
Digital Equipment Corporation
EG&G Florida, Inc.
Embry Riddle University
Final Frontier Magazine
Florida Institute of Technology
Florida Solar Energy Systems
Florida Space Consortium
General Dynamics Space Systems Division
Harris Corporation
Helicomb International
Hewlett Packard Corporation
I-NET, Inc.
International Business Machines Corporation
Johnson Controls, Inc.
Krieger Publishing Company, Inc.
Lockheed Engineering and Science Company
Lockheed Missiles and Space Company
Lockheed Space Operations Company
Martin Marietta Astronautics
McDonnell Douglas Aerospace
McDonnell Douglas Corporation
NASA STI Program
Naval Ordnance Test Unit
NYMA, Inc.
PRC, Inc.
Research Triangle Institute
Rocketdyne
Rockwell
Smith Barney Shearson
SSI Service Company
STC
Sun Microsystems
Thiokol Corporation
United Technologies Corporation, USBI Company
Xerox Corporation

Youth Science Fair

Science fair displays and demonstrations from local secondary school students will be open to the public from 11:00 a.m. to 7:00 p.m. on Tuesday, and 12:00 noon to 8:00 p.m. on Wednesday. The Thursday schedule is from 9:00 a.m. to 1:00 p.m. All Youth Science Fair activities will take place in the Dolphin Room of the Cocoa Beach Holiday Inn.

Judging will be conducted from 8:00 a.m. to 12:00 p.m. on Wednesday, April 27. The awards will be presented to the winners at the "Meet the Astronauts" panel session to be held at the Howard Johnson Plaza-Hotel in Cocoa Beach at 7:00 p.m. on Thursday, April 28.

Pioneers' Day

The Pioneers' Day Banquet '94 will be held on Friday, April 29, at the Officers' Club, Patrick Air Force Base.

Social Hour: 6:30 p.m.
Dinner: 7:30 p.m.
Speaker: 8:30 p.m.
John Young
Astronaut

Registration is April 27, 28 and 29 at the Dolphin Room, Holiday Inn, Cocoa Beach, and 5:30 to 6:30 p.m. at the Officers' Club on April 29.

Space Congress Golf Tournament

Golfers will be able to enjoy a tournament at the Patrick AFB Course on Friday, April 29.

The tournament will be a four player, select shot "scramble" format, as in the past. You may sign up with **one partner** or by yourself. The tournament committee will assign teams based on playing ability. Foursomes may sign up if they provide a combined total certifiable handicap of 55 or higher. Fill in your name and average score or handicap for 18 holes on the registration form, along with the same for your partner, and enclose \$35, each person. A maximum of 144 congress participants will be registered on a first come, first in basis. Lunch, refreshments on the course, green fees, carts, and trophies are included in the fee. Buffet lunch from 11:30 a.m., and shotgun start at 1:00 p.m. will allow completion in time for Pioneers' Banquet attendance. Maps are available at the Registration Desk. Participants should check in at Registration table with the Golf Committee.

Canaveral Council of Technical Societies

CCTS Member Societies:

Air Force Association (Cape Canaveral Chapter)
Air Force Association (Space Coast Chapter)
American Institute of Aeronautics and Astronautics
American Meteorological Society
American Society of Civil Engineers
American Society of Heating, Refrigeration and A/C Engineers
American Society for Industrial Security
American Society of Mechanical Engineers
American Society for Quality Control
American Society of Safety Engineers
American Society for Training and Development
American Welding Society
Armed Forces Communication Electronics Association
Florida Engineering Society
Florida Space Business Roundtable
Institute of Electrical and Electronic Engineers
Institute of Industrial Engineers
Missile, Space and Range Pioneers, Inc.
NASA Alumni League
National Contract Management Association
National Space Club
Society for Technical Communications
Society of American Military Engineers
Society of Logistics Engineers

Society of Manufacturing Engineers
Society of Women Engineers

Associate Members:

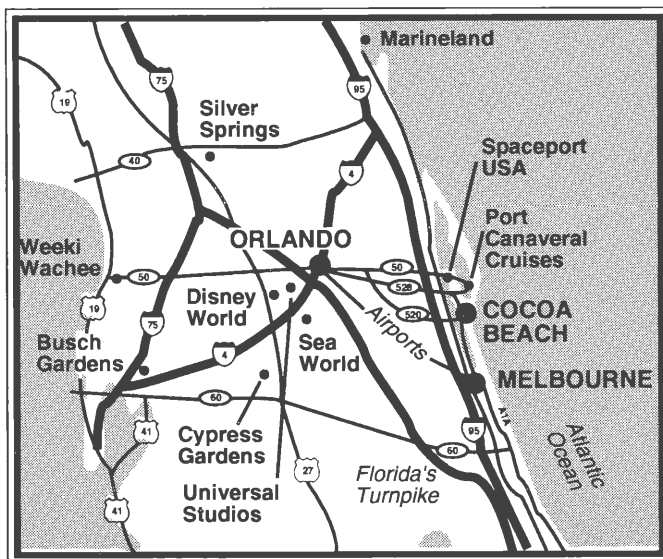
Association for Quality and Participation
National Management Association, Florida Space Coast Council
USAF Space & Missile Museum Foundation

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

Attraction Centers

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

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



Program

TUESDAY, APRIL 26

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

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

Introductions: George Faenza
General Chairman
Speaker: Honorable Jim Bacchus
Congressman

Jim Bacchus serves the 15th District of Florida in the U.S. House of Representatives. His district includes all of Brevard and Indian River counties and parts of Osceola and Polk counties in the center of the state. Now in his second term, Congressman Bacchus serves on the Science, Space and Technology Committee and on the Banking, Finance and Urban Affairs Committee in the House.



Before his election in 1990 in his first try for elected office, Bacchus was at various times a journalist, a senior aide to former Florida Governor Reubin Askew, an international trade negotiator for the United States, a corporate attorney with a major Florida law firm, and a leading community activist in Central Florida. He has spent a lifetime practicing "hands-on citizenship" and is perhaps best known for his frequent "Citizen Saturdays" — community service projects he organizes with local volunteers.

Congressman Bacchus is a graduate of Vanderbilt University, the graduate school of Yale University, and the Florida State University College of Law. He has been married since 1976 to the former Rebecca McMillan. Jim and Rebecca live in Merritt Island, Fla., with their son, Joey, and their daughter, Jamey. They are members of Riverside Presbyterian Church in Cocoa Beach.

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

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

HUMANS WORKING IN SPACE: A DISCUSSION OF THE ACCOMPLISHMENTS AND BENEFITS OF HUMANS WORKING IN SPACE

Panel Chairperson: Dr. Lawrence J. DeLucas, Director, Center for Macromolecular Crystallography, Professor, Department of Optometry, University of Alabama, Birmingham, AL *USML-1*

MEMBERS:

Sergei Konstantinovich Krikalev, Russian Cosmonaut (Mission specialist, STS-60. Has spent over 15 months in space.)

Gene Trinh, Research Scientist, Jet Propulsion Laboratory, Pasadena, CA (Payload specialist, STS-50.) *USML-1*

Charlie Walker, Senior Specialist, McDonnell Douglas Space Systems, Arlington, VA (First commercially sponsored mission specialist.)

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

Howard Johnson Plaza-Hotel, Carlyle's Alcove

EXHIBITS (11:00 a.m. to 7:00 p.m.)

Cocoa Beach Hilton and the Comfort Inn & Suite Resort

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

Holiday Inn, Manatee Room

Introductions: George Faenza
General Chairman
Speaker: David A. Wolf, M.D.
NASA Astronaut

Dr. David A. Wolf was born August 23, 1958, in Indianapolis, Indiana and graduated from North Central High School in Indianapolis, Indiana. He was awarded a bachelor of science degree in electrical engineering "with distinction" from the honors curriculum from Purdue University in 1978, a doctorate in medicine and received an Academic Achievement Award upon graduation from Indiana University in 1982. He completed his medical internship at Methodist Hospital (1983) in Indianapolis, Indiana and completed the USAF flight surgeon primary training at Brooks Air Force Base in San Antonio, Texas. He is a flight surgeon in the Air National Guard (1982 to present) and has logged over 500 hours of air combat training as a weapons systems officer in the F-4 Phantom jet.



Dr. David A. Wolf has been awarded and recognized by various aerospace medical associations. His outstanding honors include the NASA Exceptional Engineering Achievement Medal (1990) and NASA Inventor of the Year (1992). He received the Carl R. Ruddell scholarship award for research in medical ultrasonic signal and image processing and is a member of Eta Kappa Nu and Phi Eta Sigma honorary societies. Dr. Wolf has received three NASA Superior Performance Awards and five Space Act Awards for inventions and patents on a new class of 3-dimensional human tissue culture instrumentation.

Dr. Wolf has 11 years of NASA experience. In 1983 Dr. Wolf joined the Medical Services Division of Johnson Space Center in Houston, Texas. He was responsible for development of the American Flight Echocardiograph which obtained medical research data on the effects of space flight on astronauts cardiovascular system. Upon completion he was assigned as chief engineer for development of the Space Station Freedom medical facility. In 1986 he was assigned to direct development of the Space Bioreactor and associated cancer research and tissue culture applications which utilize controlled gravitational conditions. He has particular expertise in the design of real time computer process control systems, bioprocessing, and human aerospace physiology.

Selected by NASA in January 1990, Dr. Wolf became an astronaut in July 1991. He is qualified for assignment as a mission specialist on Space Shuttle flights. Since then, he has been assigned various technical duties in the Mission Support Branch of the Astronaut Office.

Prior to selection for his first space flight, Dr. Wolf was part of a team responsible for Orbiter processing, vehicle prelaunch checkout and final launch configuration.

Recently, Dr. Wolf served as a mission specialist on STS-58 on the seven-person life science research mission aboard the Space Shuttle Columbia, launching from the Kennedy Space Center on October 18, 1993, and landing at Edwards Air Force Base on November 1, 1993. This record duration fourteen-day Space Shuttle mission has been recognized by NASA management as the most successful and efficient Spacelab flight that NASA has flown. The crew performed neurovestibular, cardiovascular, cardiopulmonary, metabolic and musculoskeletal medicine experiments on themselves and 48 rats, expanding our knowledge of human and animal physiology both on Earth and in space flight. In addition, the crew performed 16 engineering tests aboard the Orbiter Columbia and 20 Extended Duration Orbiter Medical Project experiments. The mission was accomplished in 225 orbits of the Earth in 336 hours, 13 minutes, 01 second.

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

A. SPACE STATION

Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairperson: Dr. Robert Parker, Deputy Associate Administrator (Operations), Office of Space Flight, NASA Headquarters, Washington, D.C.

Session Organizer: Mr. Shaman Mullick, Harris Space Systems Corporation, Kennedy Space Center, FL

1. SPACE STATION FREEDOM/ALPHA: PRELUDE TO CITIES IN SPACE?

Dr. R. Bruce Hosken, Grumman Technical Services Division, Kennedy Space Center, FL

2. SPACE STATION LOGISTICAL RESUPPLY OPTIONS AND CONSIDERATIONS

Capt. Paul Krey, USAF, Cape Canaveral Air Force Station, FL

3. AN EXAMINATION OF THE HUMAN FACTORS SUPPORT OF NASA'S SAFETY DIRECTORATE ON THE SPACE STATION PROCESSING FACILITY (SSPF)

H. Greig Lindner, McDonnell Douglas Aerospace, Kennedy Space Center, FL

B. SPACE EDUCATION

Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairperson: Dr. Helenmarie Hofman, Associate Professor, Gettysburg College, Gettysburg, PA

Session Organizer: Ms. Priscilla Elfrey, NASA, Kennedy Space Center, FL

1. SPACE EXPERIMENTATION: MOTIVATING STUDENTS IN THE SCIENCE/ITA STUDENT PROGRAM

V. A. Cassanto, Instrumentation Technology Associates, Inc., Exton, PA

U. R. Alvarado, Instrumentation Technology Associates, Inc., Exton, PA

2. IMPACT OF STAFF DEVELOPMENT ON TEACHERS INCORPORATING SPACE SCIENCE INTO THE CURRICULA

Dr. Helenmarie Hofman, Gettysburg College, Gettysburg, PA

3. SPACE EDUCATION, WHY SPACE INTIMIDATES TEACHERS

Peter W. Wood, Wood Associates, Edenton, NC

Barbara J. Wood, Wood Associates, Edenton, NC

4. THE NASA SPACE LIFE SCIENCES TRAINING PROGRAM - TEN YEARS OF ACCOMPLISHMENTS

Ronald Biro, Bionetics Corporation, Kennedy Space Center, FL

Bill Munsey, NASA, Kennedy Space Center, FL

Linda Chamberlin, Bionetics Corporation, Kennedy Space Center, FL

5. INTERDISCIPLINARY SPACE SYSTEMS EDUCATION AT THE FLORIDA TECH SPACEPORT GRADUATE CENTER

Dr. John F. Clark, Florida Tech, Titusville, FL

6. USING COMPUTER BASED TRAINING FOR RECERTIFICATION OF SPACE TECHNICIANS

Catherine A. Eadens, Lockheed Space Operations Company, Kennedy Space Center, FL

7. MULTIMEDIA COURSEWARE DEVELOPMENT AT THE KENNEDY SPACE CENTER: SPACE SHUTTLE SYSTEM COURSEWARE DESIGN

Dr. Suzanne Cornelius, Lockheed Space Operations Company, Kennedy Space Center, FL

C. ADVANCED TECHNOLOGY

Holiday Inn, Manatee Rooms A & B

Session Chairperson: Mr. William Gasko, Director, Center for Technology Commercialization, Inc., Westborough, MA

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

1. SUB-OPTIMAL PERFORMANCE REGIMES-DYNAMIC INTEGRATED SIMULATIONS

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

2. PROPULSION ADVISORY TOOL

Bob Beil, NASA, Kennedy Space Center, FL

Lisa Bird, Lockheed Space Operations Company, Kennedy Space Center, FL

Larry Fineberg, Rockwell Space Systems Division, Kennedy Space Center, FL

Bob Houvener, Lockheed Sanders, Inc., Nashua, NH

Eric Mickelson, Lockheed Space Operations Company, Kennedy Space Center, FL

John Sterritt, Lockheed Space Operations Company, Kennedy Space Center, FL

3. RUBICON SYSTEM FOR SPACE SHUTTLE VEHICLE HEALTH MANAGEMENT
T. R. Fowler, Rockwell Space Systems Division, Kennedy Space Center, FL
A. C. Melichar, Rockwell Space Systems Division, Kennedy Space Center, FL
S. B. Wilson, NASA, Kennedy Space Center, FL
4. SHUTTLE COMPONENT STRUCTURAL INTEGRITY MONITORING IN HARSH NOISE ENVIRONMENT
James C. Yeh, United Technologies Corporation/USBI Company, Kennedy Space Center, FL
R. Robert Stephan II, United Technologies Corporation/Pratt & Whitney, West Palm Beach, FL
5. A PROPOSED EXPERIMENT FOR GENERATING FRACTIONAL GRAVITY IN SPACE UTILIZING THE SPACE SHUTTLE AS A LABORATORY
Richard C. Wilkins, Lockheed Space Operations Company, Titusville, FL
6. NON-DESTRUCTIVE DETECTION OF CORROSION UNDER PAINT ON CRITICAL SURFACES
H. H. Delgado, NASA, Kennedy Space Center, FL
J. D. Collins, NASA, Kennedy Space Center, FL
S. W. Thayer, I-NET, Kennedy Space Center, FL
S. M. Gleman, I-NET, Kennedy Space Center, FL
M. Verdier, NASA, Kennedy Space Center, FL
C. Hallberg, I-NET, Kennedy Space Center, FL

SPACE CONGRESS BANQUET

Radisson Resort at the Port, Grande Caribbean Ballroom

Social Hour:	7:00 p.m.
Dinner:	8:00 p.m.
Program:	9:00 p.m.
Introductions:	George Faenza General Chairman
Speaker:	Majel Barrett Roddenberry

"The First Lady of Star Trek," Majel Barrett Roddenberry has become one of the all-time Trek favorites. Barrett, who starred as Christine Chapel in the original *Star Trek* series and in two of the six Trek movies, has also portrayed Lwuxana Troi in *Star Trek: The Next Generation* and in *Star Trek: Deep Space Nine*. In this role as "The Auntie Mame of the Galaxy." Barrett has endeared herself to millions of fans worldwide.

Barrett was originally cast in the role of the First Officer in the first Star Trek pilot, *The Cage*, which was rejected by NBC. She then returned in the second pilot as Nurse Chapel and the rest is history.

In addition to those on-screen roles, Barrett has become familiar as the voice of the computers on all three Star Trek series and in the animated



Star Trek TV show from the 1970s in which she voiced several characters in addition to the computer. In the movies *Star Trek-The Motion Picture* and in *Star Trek IV: The Voyage Home*, Barrett played Dr. Christine Chapel.

In her varied acting career, she has performed with notable success on the stage, in motion pictures and in television dramas. Among her film credits are: *The Buccaneer*, *As Young As We Are*, and *The Quick and the Dead*. Her numerous television appearances include guest roles on: *The Eleventh Hour*, *Dr. Kildare*, *Bonanza*, *General Hospital* and *The Lieutenant*.

A native of Columbus, Ohio, she was born Majel Lee Hudee. Her first name is American Indian origin, but by nationality, she is a Bohemian. She grew up in Cleveland, where she graduated from Shaker Heights High School. She next attended Flora Stone Mather College for Women at Western Reserve University. Barrett later transferred to the University of Miami (Florida) and graduated as a Theater Arts Major. She then entered law school for a year, then moved to New York, determined to become an actress.

Her start came during 11 weeks of stock in Bermuda, followed by a play that closed in Boston before it could reach Broadway, and then a nine-month tour in *Solid Gold Cadillac*. Turning to the West Coast, she began studying with Anthony Quinn who, impressed by her talent, took her to Paramount where she appeared in three motion pictures.

More study followed, first drama with Sanford Meisner and Jeff Hayden, then comedy with Lucille Ball. The latter led to a year's contract at Desilu Studios. Since that time, she has been free-lancing, appearing in a number of movie and television projects, most recently the 1994 release of *Teresa's Tattoo* in which she plays opposite Nanette Fabray and Keifer Sutherland.

She married the late Gene Roddenberry in 1969. Their son, Rod, is a college student.

In addition to her recurring roles on *Star Trek: The Next Generation* and *Star Trek: Deep Space Nine*, Barrett is the president of Lincoln Express in Los Angeles, a mail-order firm specializing in Star Trek memorabilia.

A member of the National Space Society Board of Governors, Barrett has appeared in Public Service Announcements promoting the United States Space Program and, in 1993, she received a SpaceWeek International "Next Generation" award for her support of NASA's Space Station program.

Ms. Barrett is also active as an Animal Rights Advocate.

Barrett is sought after as a guest on the Star Trek convention circuit, thrilling audiences with her "behind the scenes" stories and updates from the Star Trek universe.

WEDNESDAY, APRIL 27

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

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

SYSTEMS WORKING IN SPACE: A DISCUSSION OF THE WORLD-WIDE BENEFITS FROM UNMANNED SYSTEMS WORKING IN SPACE

Panel Chairperson: Mr. Gus Guastafarro, Vice President, NASA and Federal Systems, Lockheed Missiles and Space Company, Inc., Sunnyvale, CA

MEMBERS:

Marty Donoho, EOS/PM Project Manager, NASA-GSFC, Greenbelt, MD

Doug McClennon, Spacecraft Manager, EOS/PM Project, GSFC, Greenbelt, MD

Al Diaz, Deputy Associate Administrator for Space Science, NASA Headquarters, Washington, D.C.

Ian Pryke, Head of ESA Washington Office, Washington, D.C.

Frank Cepollina, Project Manager, HST Flight Systems and Servicing Project, NASA-GSFC, Greenbelt, MD

Tom Daugherty, Program Manager of Flight Systems and Servicing Project, Lockheed Missile and Space Company, Inc., Sunnyvale, CA

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

Howard Johnson Plaza-Hotel, Carlyle's Alcove

EXHIBITS (11:00 a.m. to 8:00 p.m.)

Cocoa Beach Hilton and the Comfort Inn & Suite Resort

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

A. COMMERCIAL UTILIZATION

Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

Session Chairperson: David Wensley, Vice President and General Manager, Strategic Business Development, McDonnell Douglas Aerospace, Huntington Beach, CA

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

1. BIOMEDICAL APPLICATIONS FROM MICROGRAVITY EXPERIMENTS FLOWN ON THE CMIX COMMERCIAL SHUTTLE FLIGHTS

John M. Cassanto, President, Instrumentation Technology Associates, Inc., Exton, PA

Dr. Dennis Morrison, NASA, Johnson Space Center, TX

Dr. Paul Todd, University of Colorado, Boulder, CO

Dr. Richard D. Korszun, Brookhaven National Laboratory of Biology, Upton, NY

Session Organizer: Ms. Jennifer K. Lewis, McDonnell Douglas Aerospace, Kennedy Space Center, FL

1. SPACE POLICY AND SOCIAL ETHICS

Harold S. Issen, Lockheed Space Operations Company, Kennedy Space Center, FL

2. HISTORY OF THE FIRST NASA CONTRACT WITH RUSSIA

B. D. Connelly-Fratzke, NASA, Washington, D.C.

3. CLOSED LOOP SYSTEMS

Charlie Quincy, NASA, Kennedy Space Center, FL

Susan McBrearty, EG&G, Kennedy Space Center, FL

4. ELECTROLYTIC OXYGEN ENRICHMENT USING SUPEROXIDE ION IN A SOLID POLYMER MEMBRANE ELECTROLYTE

Dr. Clovis A. Linkous, Florida Solar Energy Center, Cape Canaveral, FL

Ali T. Raissi, Florida Solar Energy Center, Cape Canaveral, FL

5. ERGONOMIC CONSIDERATIONS IN LAUNCH VEHICLE DESIGN AND PROCESSING FOR OPERATIONAL EFFICIENCY

Mark D. Heileman, Rockwell Space Systems Division, Kennedy Space Center, FL

Dr. Pamela McCauley-Bell, Rockwell Space Systems Division, Kennedy Space Center, FL

B. PRODUCTS

Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms

Session Chairperson: Mr. Robert Stark, Director, Far West Regional Technology Transfer Center, Los Angeles, CA

Session Organizer: Ms. Rachel H. Webb, Lockheed Space Operations Company, Kennedy Space Center, FL

1. A COMBINED PROBABILISTIC AND EXPERT SYSTEM APPROACH FOR ASSIGNING REPAIR START-TIMES AT THE NASA SHUTTLE LOGISTICS DEPOT

S. Khajenoori, Embry Riddle Aeronautical University, Daytona Beach, FL

D. G. Linton, University of Central Florida, Orlando, FL

J. V. Bullington, Rockwell Space Systems Division, Kennedy Space Center, FL

J. C. Winkler, Rockwell Space Systems Division, Kennedy Space Center, FL

G. Hebert, University of Central Florida, Orlando, FL

E. Litumbe, University of Central Florida, Orlando, FL

2. SDIO AND NASA DEVELOPED TECHNOLOGY IMPROVES THE QUALITY OF LIFE ON EARTH

Jay K. Hennig, Moog, Inc., East Aurora, NY

3. LAUNCH SITE COMPUTER SIMULATION AND ITS APPLICATION TO PROCESSES

Michael D. Sham, Lockheed Space Operations Company, Kennedy Space Center, FL

Andrew Siprelle, Siprelle Associates, Maryville, TN

4. FLORIDA/NASA-KSC TECHNOLOGY TRANSFER PARTNERSHIP
Frank Kinney, Technological Research and Development Authority, Titusville, FL
5. AUTOMATED MAINFRAME DATA COLLECTION IN A NETWORK ENVIRONMENT
David L. Gross, Analex Space Systems, Inc., Kennedy Space Center, FL
6. ROBOTIC SYSTEM FOR THE SERVICING OF THE ORBITER THERMAL PROTECTION SYSTEM
T. Graham, NASA, Kennedy Space Center, FL
R. Bennett, I-NET, Kennedy Space Center, FL
K. Dowling, Carnegie Mellon University, Pittsburgh, PA
D. Manoucheri, Rockwell Space Systems Division, Kennedy Space Center, FL
C. Cowan, SRI International, Menlo Park, CA
E. Cooper, NASA, Langley Research Center, VA
7. SPACE TOURISM: A FLIGHT OF FANTASY OR THE NEXT MAJOR SPACE PRODUCT?
Dr. Barbara A. Stone, NASA, Washington, D.C.

**C. TECHNICAL CONCEPTS FOR FUTURE STEPS
Holiday Inn, Manatee Rooms A & B**

Session Chairperson: Dr. W. A. Gaubatz, Director-Program Manager, Delta Clipper Programs, McDonnell Douglas Aerospace, Huntington Beach, CA

Session Organizer: Dr. Alan E. Drysdale, McDonnell Douglas Aerospace, Kennedy Space Center, FL

1. THE HORIZON MISSION METHODOLOGY - WORK IN PROGRESS
John L. Anderson, NASA, Washington, D.C.
2. SINGLE STAGE TO ORBIT VEHICLE PROPELLANT TRADE STUDY: AN APPLICATION OF THE ANALYTIC HIERARCHY PROCESS
Mark D. Heileman, Rockwell Space Systems Division, Kennedy Space Center, FL
J. Van Bullington, Rockwell Space Systems Division, Kennedy Space Center, FL
Dr. Michael Mullens, University of Central Florida, Orlando, FL
3. CONTROLLED ECOLOGICAL LIFE SUPPORT SYSTEM MONITOR AND CONTROL SYSTEM
Jan Krauskopf, McDonnell Douglas Aerospace, Kennedy Space Center, FL
Dr. Alan Drysdale, McDonnell Douglas Aerospace, Kennedy Space Center, FL
Dave Hendricks, McDonnell Douglas Aerospace, Kennedy Space Center, FL

4. EARTH DIVIDENDS FROM THE DEVELOPMENT OF TECHNOLOGIES AND TECHNIQUES FOR SPACE VEHICLE ROBOTICS
Dr. Margaret M. Clarke, Rockwell Space Systems Division, Downey, CA
David L. Gerhardt, Rockwell Space Systems Division, Downey, CA
Joseph M. Hansen, Rockwell Space Systems Division, Downey, CA
Dr. Thomas S. Lindsey, Rockwell Space Systems Division, Downey, CA
Davoud Manoucherhri, Rockwell Space Systems Division, Downey, CA
Suzanne M. Hodge, Rockwell Space Systems Division, Cape Canaveral, FL
5. ON-ORBIT INFRASTRUCTURE REQUIREMENTS FOR A RE-USABLE SOLAR ELECTRIC ORBITAL TRANSFER VEHICLE
E. C. Cady, McDonnell Douglas Aerospace, Huntington Beach, CA
K. E. Dayton, McDonnell Douglas Aerospace, Huntington Beach, CA
T. M. Miller, McDonnell Douglas Aerospace, Huntington Beach, CA

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

**MEET THE ASTRONAUTS (7:00 p.m. to 9:00 p.m.)
Howard Johnson Plaza-Hotel, Challenger Main Ballroom**

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

Astronauts: As available between training commitments.

FRIDAY, APRIL 29

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

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

FUTURE STEPS IN SPACE: A DISCUSSION OF CURRENT RESEARCH, PRACTICAL AND VISIONARY PLANS FOR THE FUTURE OF THE WORLD'S SPACE EFFORT

Panel Chairperson: Mr. Pete Conrad, Launch Director, McDonnell Douglas Aerospace, Single Stage Rocket Technology (SSRT), White Sands Missile Range, NM

MEMBERS:

Haym Benaroya, Associate Professor of Mechanical and Aerospace, Rutgers University, Piscataway, NJ

Dr. Wendell Mendell, Solar Systems Exploration Division, NASA-JSC

Dr. W. A. Gaubatz, McDonnell Douglas Aerospace, Huntington Beach, CA

John F. Connolly, Planetary Projects Office, NASA-JSC

SPACE CONGRESS GOLF TOURNAMENT "SCRAMBLE"

(11:30 a.m. to 6:00 p.m.)

Patrick AFB Golf Course

Buffet Lunch: 11:30 a.m.

Shotgun Start: 1:00 p.m.

Map available at registration desk.

PIONEERS' ANNUAL BANQUET

Patrick AFB, Officers' Club

Social Hour: 6:30

Dinner: 7:30

Speaker: 8:30

John Young

NASA Astronaut

PROGRAM SUMMARY

MONDAY, APRIL 25

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

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

TUESDAY, APRIL 26

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

REGISTRATION DESK OPEN, Holiday Inn, Dolphin Room

8:30 a.m.

KEYNOTE ADDRESS

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

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

PANEL SESSION I: HUMANS WORKING IN SPACE: A DISCUSSION OF THE ACCOMPLISHMENTS AND BENEFITS OF HUMANS WORKING IN SPACE

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

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

SPACE VIDEOS, Howard Johnson Plaza-Hotel, Carlyle's Alcove

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

YOUTH SCIENCE FAIR, Holiday Inn, Dolphin Room

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

EXHIBITS, Cocoa Beach Hilton and the Comfort Inn & Suite Resort

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

LUNCHEON, Holiday Inn, Manatee Room

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

PAPER SESSION I:

- A. SPACE STATION, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. SPACE EDUCATION, Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. ADVANCED TECHNOLOGY, Holiday Inn, Manatee Room

7:00 p.m.

BANQUET SOCIAL HOUR, Radisson Resort at the Port, Grande Caribbean Ballroom

8:00 p.m.

BANQUET, Radisson Resort at the Port, Grande Caribbean Ballroom

WEDNESDAY, APRIL 27

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: SYSTEMS WORKING IN SPACE: A DISCUSSION OF THE WORLD-WIDE BENEFITS FROM UNMANNED SYSTEMS WORKING IN SPACE

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

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

SPACE VIDEOS, Howard Johnson Plaza-Hotel, Carlyle's Alcove

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

EXHIBITS, Cocoa Beach Hilton and the Comfort Inn & Suite Resort

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

YOUTH SCIENCE FAIR, Holiday Inn, Dolphin Room

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

PAPER SESSION II:

- A. COMMERCIAL UTILIZATION, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms
- B. NON-COMMERCIAL UTILIZATION, Howard Johnson Plaza-Hotel, Columbia/Enterprise Rooms
- C. DOD SPACE OPERATIONS, Holiday Inn, Manatee Room

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

EXHIBIT CENTER RECEPTION

Cocoa Beach Hilton and the Comfort Inn & Suite Resort

THURSDAY, APRIL 28

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: DIVIDENDS ON EARTH FROM SPACE: AN OVERVIEW OF THE PRODUCTS AND SERVICES PRODUCED HERE ON EARTH THROUGH THE APPLICATION OF SPACE-DERIVED TECHNOLOGY

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

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

YOUTH SCIENCE FAIR, Holiday Inn, Dolphin Room

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

EXHIBITS, Cocoa Beach Hilton and the Comfort Inn & Suite Resort

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

SPACE VIDEOS, Howard Johnson Plaza-Hotel, Carlyle's Alcove

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

LUNCHEON, Holiday Inn, Manatee Room

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

PAPER SESSION III:

- A. RESEARCH, Howard Johnson Plaza-Hotel, Atlantis/Discovery Rooms

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

- C. TECHNICAL CONCEPTS FOR FUTURE STEPS, Holiday Inn, Manatee Room

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

SPACE CONGRESS RECEPTION, Holiday Inn

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

MEET THE ASTRONAUTS, Howard Johnson Plaza-Hotel, Challenger Main Ballroom

FRIDAY, APRIL 29

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 IV:

FUTURE STEPS IN SPACE: A DISCUSSION OF CURRENT RESEARCH, PRACTICAL AND VISIONARY PLANS FOR THE FUTURE OF THE WORLD'S SPACE EFFORT

Howard Johnson Plaza-Hotel, Challenger Main Ballroom

9:00 a.m. to 12:00 noon

SPACE VIDEOS, Howard Johnson Plaza-Hotel, Carlyle's Alcove

11:30 a.m. to 6:00 p.m.

SPACE CONGRESS GOLF TOURNAMENT, Patrick AFB, Golf Course

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

PIONEERS' ANNUAL BANQUET, Patrick AFB, Officers' Club

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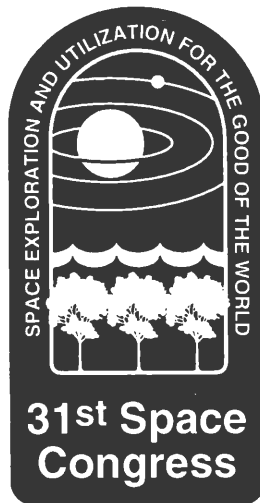
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