
USA
NASA
Discovery

launch.2

September 29, 1988

KENNEDY SPACE CENTER, Fla. — The Space Shuttle Discovery and its five man crew was launched from pad 39-B at 11:37 a.m. September 29, 1988. As STS-26 embarks on its four day mission, the event marks America's return to manned space flight. On the first day of orbit, the crew deployed their primary payload, the Tracking and Data Relay Satellite (TDRS-C). The Inertial Upper Stage (IUS) then boosted the satellite into a geosynchronous altitude from low Earth orbit. The crew members of STS-26 are: Commander Rick Hauck; Pilot Richard Covey; and Mission Specialists Dave Hilmers, Mike Lounge, and George "Pinky" Nelson.

KENNEDY SPACE CENTER, FLORIDA

12/2/88 (DO)

STS-27 AND THE SPACE SHUTTLE ATLANTIS IS LAUNCHED FROM KENNEDY SPACE CENTER'S PAD 39B AT 9:30 A.M. EST ON A DEPARTMENT OF DEFENSE DEDICATED MISSION.

KSC-88PC-1441

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

August 8, 1989

Dear SPC Team Member

It is with great pleasure that I forward the enclosed reminders of the STS-28R mission following the successful return to space of the orbiter Columbia. As you know, this is a mission for the Department of Defense. Because of national security, details about the flight and payload are classified.

You can be very proud of your role in returning OV-102 to space. Columbia is the oldest member of the shuttle fleet. It had flown seven times previously, the last of which was STS-61C in January 1986. This pioneering spacecraft initiated the Space Shuttle program on April 12, 1981 and successfully completed the Orbital Flight Test Program (STS-1 through 4).

Columbia has been undergoing extensive modifications since STS-9 to bring it up to date with our newer orbiters Atlantis and Discovery. Following the January 1986 mission, Columbia was scheduled for major changes. These included more than 60 modifications to the orbiter itself as well as more than 40 tile modifications. We now have a like-new spacecraft. Many obstacles had to be overcome in preparing for flight: There was massive Thermal Protection System rework; A total mid-body/TCS rebuild; GOX System removal, cleaned and rebuilt; and, massive amounts of open paper resolved. These are but a few of our major accomplishments before Columbia was announced ready to support an August 8th launch.

You have worked long and hard and for this I thank you. I appreciate your continued dedication and support to quality and safety. We can all enjoy and take pride in the success of this mission!

E. Doug Sargent

LOOK TO LOCKHEED FOR LEADERSHIP

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-28

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-28

The STS-28 crew members are astronauts Brewster H. Shaw, Jr. (center front), Mission Commander; Richard (Dick) Richards (left front), Pilot; and Mission Specialists (back left to right) Mark N. Brown, James C. Adamson, and David C. Leestma (seated).

KENNEDY SPACE CENTER, FLORIDA

8/8/89

(NB)

KENNEDY SPACE CENTER, FLA. -- SPACE SHUTTLE COLUMBIA IS LAUNCHED FROM PAD 39B AT 8:37 a.m. EDT ON A DEPARTMENT OF DEFENSE MISSION.

KSC-89PC-761

Flight Crew Briefing

OV-102 L-1 Day (S0007) Launch Countdown

STS 28 R
Flight 8

Commander
Brewster H. Shaw

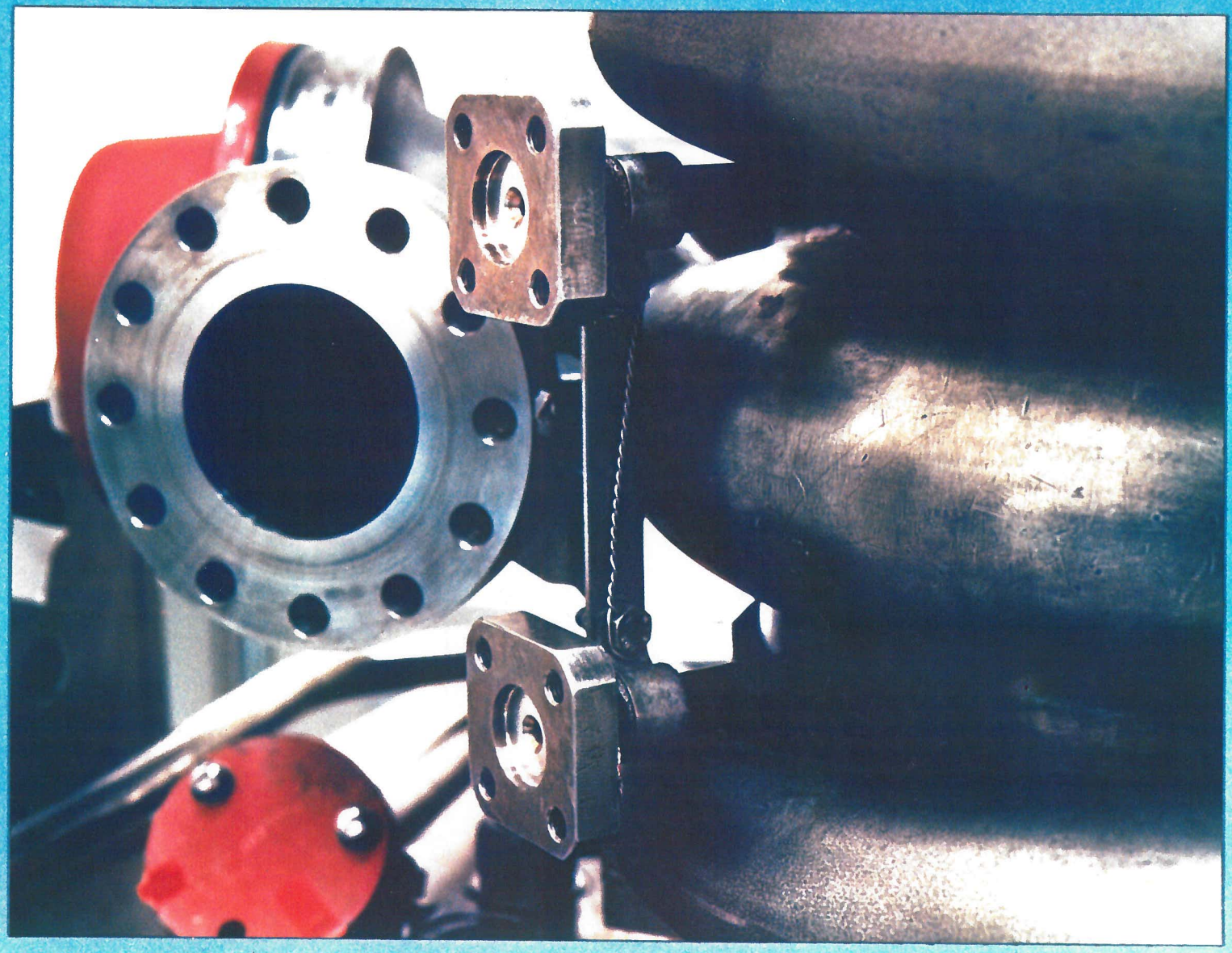
Pilot
Richard N. Richards

Mission Specialist 1
David C. Leestma

Mission Specialist 2
Mark N. Brown

Mission Specialist 3
James C. Adamson

HPOTP Balance Piston Cavity Pressure Port Standoffs & Support Bracket



Rockwell International
Rocketdyne Division

SC89c-4-594
M470

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-29

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-29

The STS-29 crewmembers are astronauts Michael L. Coats (front right), Mission Commander; John E. Blaha (left front), Pilot; and Mission Specialists (left to right) James P. Bagian, Robert C. Springer, and James F. Buchli.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

April 28, 1989

Dear SPC Team Member

It is a pleasure to forward the enclosed STS-30R Mission decal and crew photograph following another successful space shuttle launch.

This mission, our fourth return to flight launch, carried the Magellan Space probe into low earth orbit. Magellan, boosted into trajectory by an Inertial Upper Stage, is due to reach Venus in August, 1990. Upon arrival at its destination, Magellan will map Venus for eight months using radar mapping to cover 90% of the planet's surface.

When Atlantis, OV-104, returned to Kennedy Space Center atop NASA's Shuttle Carrier Aircraft in early December, turnaround presented a formidable challenge to the SPC Team. We needed to have Atlantis ready for launch by April 28th to give it every opportunity to send Magellan on its way prior to closing of the window on May 28th. Not launching would have meant a 25 month wait for Magellan to begin its voyage to Venus.

Obstacles to processing included mission damage to TPS sustained during STS-27R and changeout of more than 50 Line Replaceable Units (LRUs) running the gamut from black boxes to structural hardware. At Pad B we successfully dealt with changing out Main Propulsion System Pneumatic check valves, and replaced the SSME High Pressure Oxidizer Turbo Pumps. With all that successfully and safely accomplished the Flight Readiness Review declared Atlantis flight ready on April 14th for an April 28th launch!

You did it again and I applaud your dedication, attention to safety and quality, and your professionalism!

Thanks!

M. Doug Sargent

LOOK TO LOCKHEED FOR LEADERSHIP

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-30

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-30

The STS-30 crewmembers are (left to right) astronauts Ronald J. Grabe, Mission Pilot; David M. Walker, Mission Commander; and Mission Specialists Norman E. Thagard, Mary L. Cleave, and Mark C. Lee.


Atlantis

JOHN F. KENNEDY SPACE CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER, FLORIDA 32899
FOR RELEASE: IMMEDIATE
PHOTO CREDIT--NASA OR NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

KSC-89PC-256 UNCL. 3/11/89

THE ORBITER ATLANTIS IS BACKED OUT OF THE OPF BEGINNING ITS TOW TO THE VAB FOR SPACE SHUTTLE MISSION STS-34.
(tf)

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

You became an integral part of space history with the processing and launch of space shuttle Discovery on April 24, 1990. This historic mission deployed the Hubble Space Telescope to set the stage for space exploration and learning from its approximate 380-mile-high orbit over the next 15 years.

Future shuttle missions, scheduled for 1993 and 1996, will rendezvous with the Hubble to maintain and upgrade the observatory. As big as a railroad boxcar, the HST weighs 25,500 pounds and is 43.5 feet long and 14 feet in diameter. Deployed beyond the Earth's atmosphere, the Hubble will enable us to see seven times more deeply into space and view objects with ten times better clarity than with ground based telescopes.

Two significant modifications were completed in preparing Discovery for this mission: the new carbon brake system which allows for the use of shorter runways and the new instrumentation on the main engine high pressure oxidizer turbo pumps (HPOTP). In addition, we installed the "manipulator positioning mechanism" (MPM) and the remote manipulator arm to support deployment of the Space Telescope.

When Discovery rolled to the VAB from the OPF we had the least amount of open paper ever. This is a very favorable trend given the increased paper requirements for all "return to flight" missions. STS-31 was our 10th mission since returning to flight. Sustained team effort and individual professionalism have assured continued success and improvement. As always, safety is our number one priority.

On April 22 - just 2 days before the Hubble Telescope launch - we rolled out Columbia to Pad A for its mid-May STS-35 mission. This was only the second time in the history of the Shuttle program that we had shuttles on both pads at the same time. Another great accomplishment!

The enclosed STS-31 mission photograph and decal are provided as a token of my appreciation. Thank you for another quality job.

Doug Sargent

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-31

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-31

The STS-31 crew members: Loren J. Shriver, Mission Commander (center); (left to right) Charles F. Bolden, Pilot; Steven A. Hawley, Bruce McCandless II, and Kathryn D. Sullivan, Mission Specialists.

As depicted in the photo and represented in the mission emblem, the primary mission objective is the deployment of the Hubble Space Telescope (HST).

Named in honor of the late American astronomer Edwin P. Hubble (1889-1953), the HST is the first of the Great Observatories series of astronomical satellites and features a 2.4 meter (94 inch) diameter primary mirror. From its vantage point above the atmosphere and away from the "light pollution" of encroaching civilization, this telescope is expected to "see" about seven times farther out into space than the best terrestrial observatories. The European Space Agency is a participant in this program, having supplied the solar array systems for the generation of electrical power and one of the five scientific instruments. Subsequent Space Shuttle missions will maintain the HST and exchange scientific instruments periodically during its projected 15-20 year operational lifetime.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

The launch of Columbia on STS-32 was a promising beginning to 1990, serving to mark the arrival of a new decade of space achievement and exploration.

Columbia's mission was our eighth launch in 16 months and the first of a busy and challenging new year. The activation of a refurbished Pad A and the availability of Mobile Launcher Platform Number Three (MLP-3) expanded our capability to support a greater launch rate in the 1990's.

The STS-32 flight was a very successful and important mission. The crew deployed the SYNCOM IV-5 communications satellite and retrieved the Long Duration Exposure Facility (LDEF) after its five and a half year space journey. In addition, several middeck experiments were conducted. We can all take pride in these contributions to the national space program.

I want to express my appreciation to you and your co-workers and to note that each team member contributed to getting the job done safely and successfully. The enclosed mission decal reflects the uniqueness and singular importance of each mission, while the crew photograph reminds us that our work mandates the very best we have to offer.

Thank you for a great start to the new yea

Doug Sargent

LOOK TO LOCKHEED FOR LEAD

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-32

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-32

The STS-32 crew members: Daniel C. Brandenstein, Mission Commander (left front); James D. Wetherbee, Pilot (right front); Marsha S. Ivins, G. David Low, and Bonnie J. Dunbar, Mission Specialists (back left to right).

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

23 November 1989

Dear SPC Team Member,

Discovery's STS-33 Department of Defense mission was the third night launch of a space shuttle, and it was certainly spectacular as well as highly successful.

Please accept my thanks for another job well done. Teamwork and job accomplishment were underscored by the fact that we rolled out of the Orbiter Processing Facility 36 hours before scheduled time. Fifty-four modifications were made to Discovery during turnaround including a wiring and structural modification for relocating the Rate Gyro Assemblies. Additionally, all of the Thermal Control System blankets above the liner in the midbody were removed, redesigned with snaps, and re-installed.

These accomplishments are especially noteworthy and are the result of a great many people working closely and effectively together.

Once again, you have met your challenges professionally. The enclosed mission decal and crew photograph are presented to serve as reminders of your continuing successful team efforts.

Although DoD mission details cannot be disclosed, you can be proud of your contributions to national security interests and a safe ride for Mission Commander Frederick Gregory and crew. Congratulations!

Sincerely,

Doug Sargent

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-33

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-33

The STS-33 crew members: Frederick D. Gregory, Mission Commander (center); John E. Blaha, Pilot (back right); Manley Lanier "Sonny" Carter, Mission Specialist (back left); Kathryn C. Thornton, Mission Specialist (front left); and F. Story Musgrave, Mission Specialist (front right).

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

October 17, 1989

Dear SPC Team Member,

Given the significance of Galileo's interplanetary probe, and the "close call" by Hurricane Hugo, STS-34 is truly a memorable launch. I am pleased to share the official mission patch and crew photograph with you.

In preparation for STS-34, we successfully completed a significant amount of work processing Atlantis through the OPF. We installed the Radioisotope Thermoelectric Generator cooling system for the Galileo power source, and made numerous wiring modifications to enhance the visibility and performance of several orbiter systems. Also, the Flutter Buffet Instrumentation system was installed to measure outer wing and vertical stabilizer performance during ascent and entry.

The deployment of Galileo from the Atlantis payload bay is yet another historic occasion in our Nation's space program. Galileo is the second planetary mission of 1989 and will allow scientists to examine the planet Jupiter at close range for nearly two years.

Accompanying Galileo aboard Atlantis are two canisters containing the Shuttle Solar Backscatter Ultraviolet (SSBUV) experiment. Five middeck experiments are also scheduled for this mission, including use of an IMAX (70-millimeter) camera to film specific mission operations and earth views.

Once again, you have performed admirably in readying OV-104 for our sixth return-to-flight mission. I know that STS-34 commander Don Williams and crew join me in saying thanks for another job well done.

Doug Sargent

NASA National Aeronautics and Space Administration

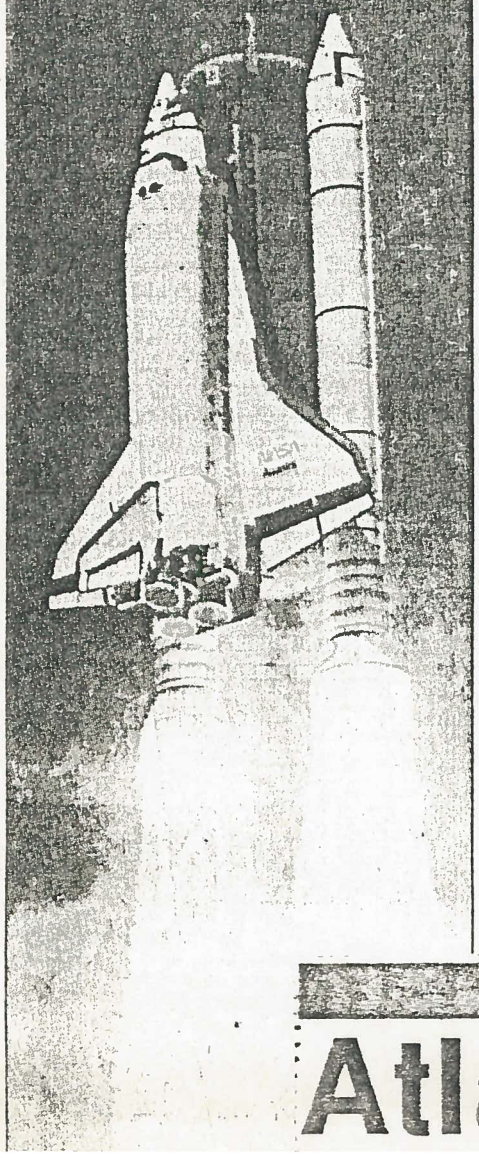
Crew of Space Shuttle Mission STS-34

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-34

The STS-34 crewmembers are: Donald E. Williams, Mission Commander: Michael J. McCulley, Mission Pilot; Mission Specialists Shannon W. Lucid, Franklin R. Chang-Díaz, and Ellen S. Baker.

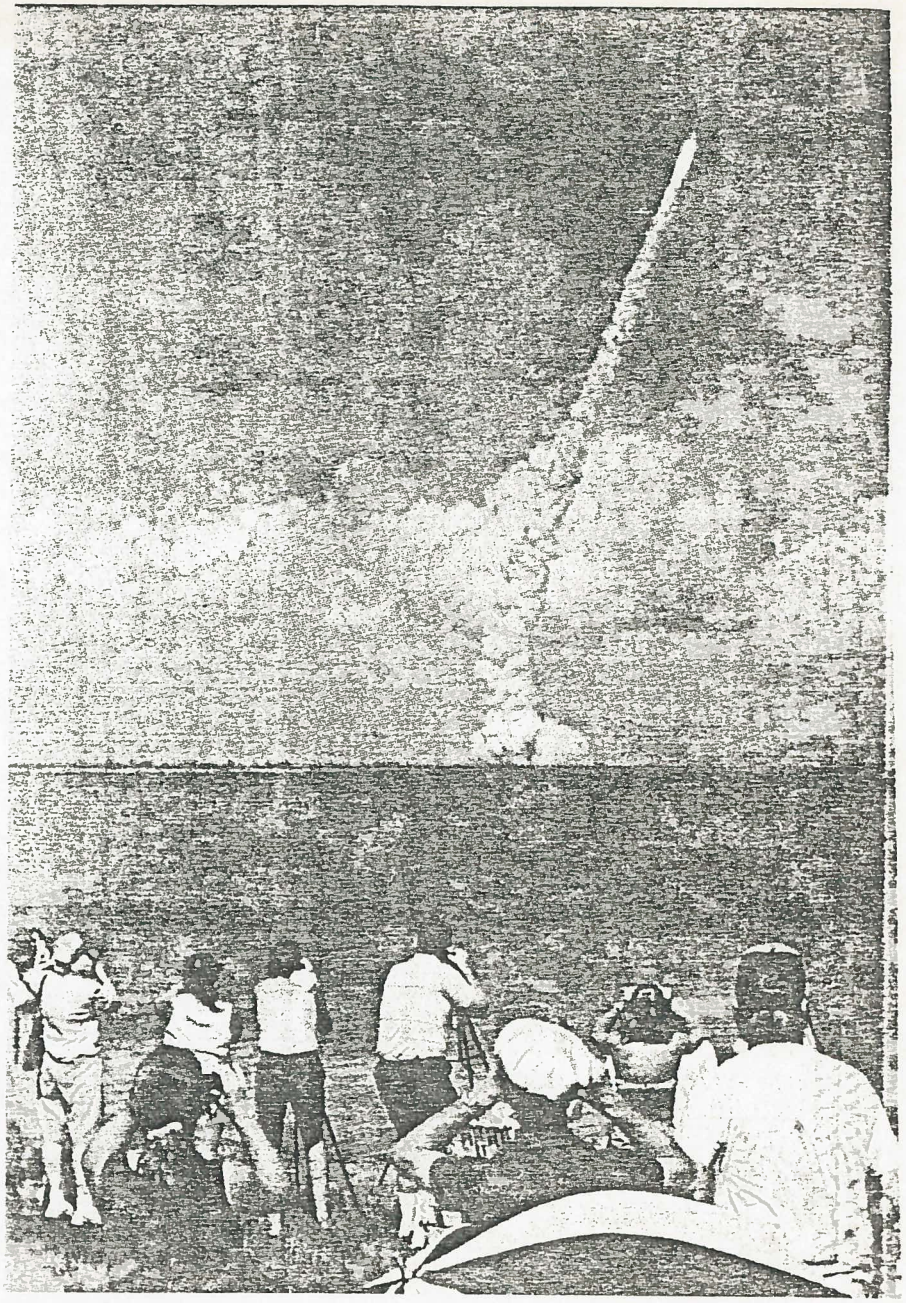
Galileo soars



October 18, 1989

Thanks for toughing it out on a 24-hour turnaround. The performance of our people and the systems you prepared were exemplary. All LSOC Management passes on their congratulations.

Keep it up!



Atlantis thunders skyward

Aspire to Excel

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

Once again, the SPC Team met a formidable challenge with a superb performance.

Our approach to obstacles encountered with the STS-35 Astro-1 Mission clearly demonstrated our commitment to safety first in launch operations. Even though the rollback and demate were disheartening, we had a smooth incident free 48-day turnaround in High Bay 2 of the Orbiter Processing Facility. As we all know, the hydrogen leak caused the rollback and contributed to a delay of several months in the launch of this mission. Even though the delay was disappointing to us all, I am proud of the professionalism showed in identifying and solving the problems which confronted us.

This was the tenth flight of the orbiter Columbia and the 38th Space Shuttle mission. It was launched from Pad 39B into its 220-statue-mile high orbit carrying the Astro-1 payload and a seven member crew commanded by Vance Brand. The Astro-1 astronomical observatory examined the invisible universe of ultraviolet and X-ray astronomy during its mission.

We are the world's premier launch team and I know that we will continue to earn that reputation in the years ahead. I am pleased to enclose the official mission decal and crew photograph.

During the forthcoming and well deserved holiday season, please be mindful of safety precautions at home and on the highways. I wish you and your family a happy holiday and look forward to starting the new year in great anticipation of the goals which lie before us.

Doug Sargent

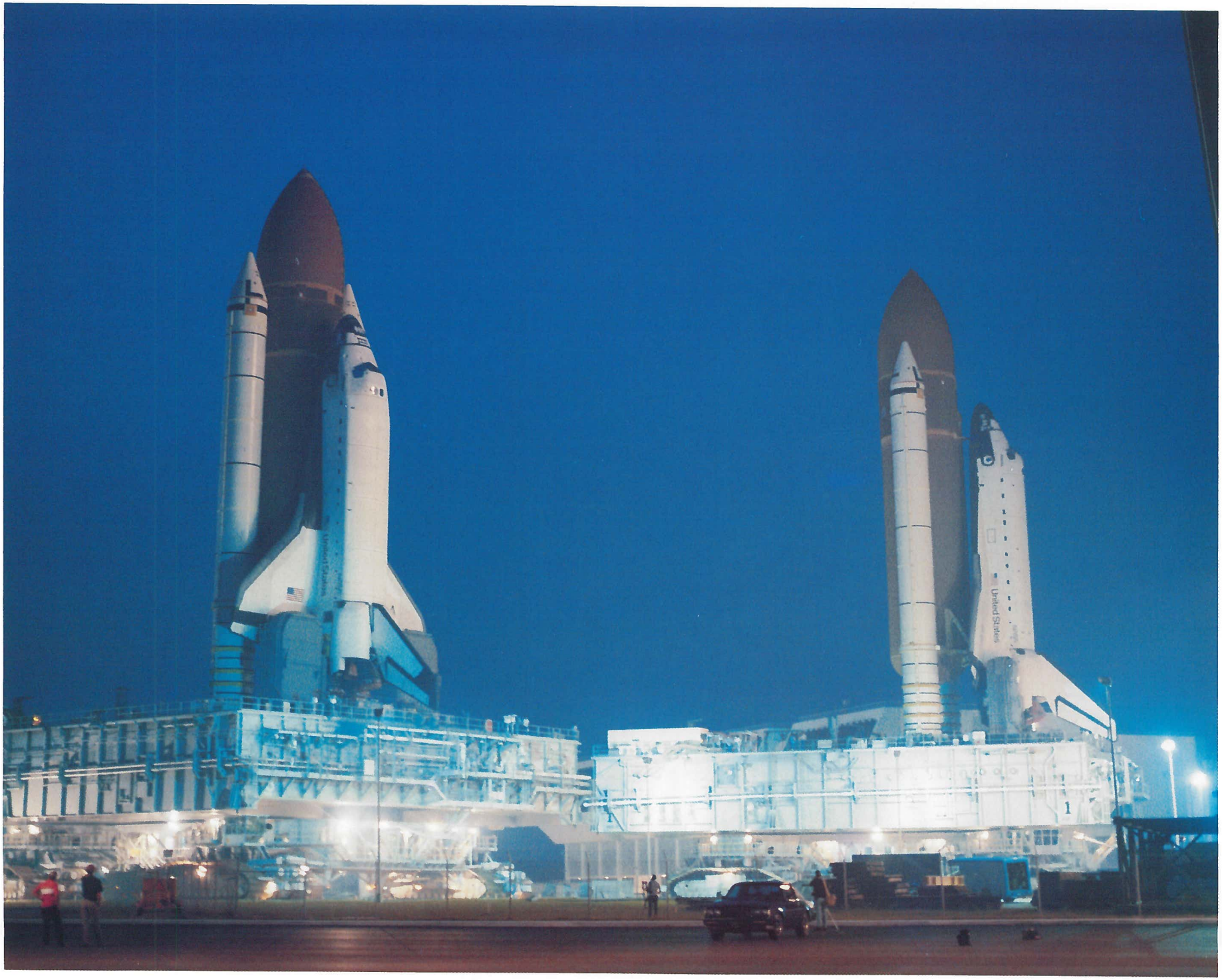
NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-35

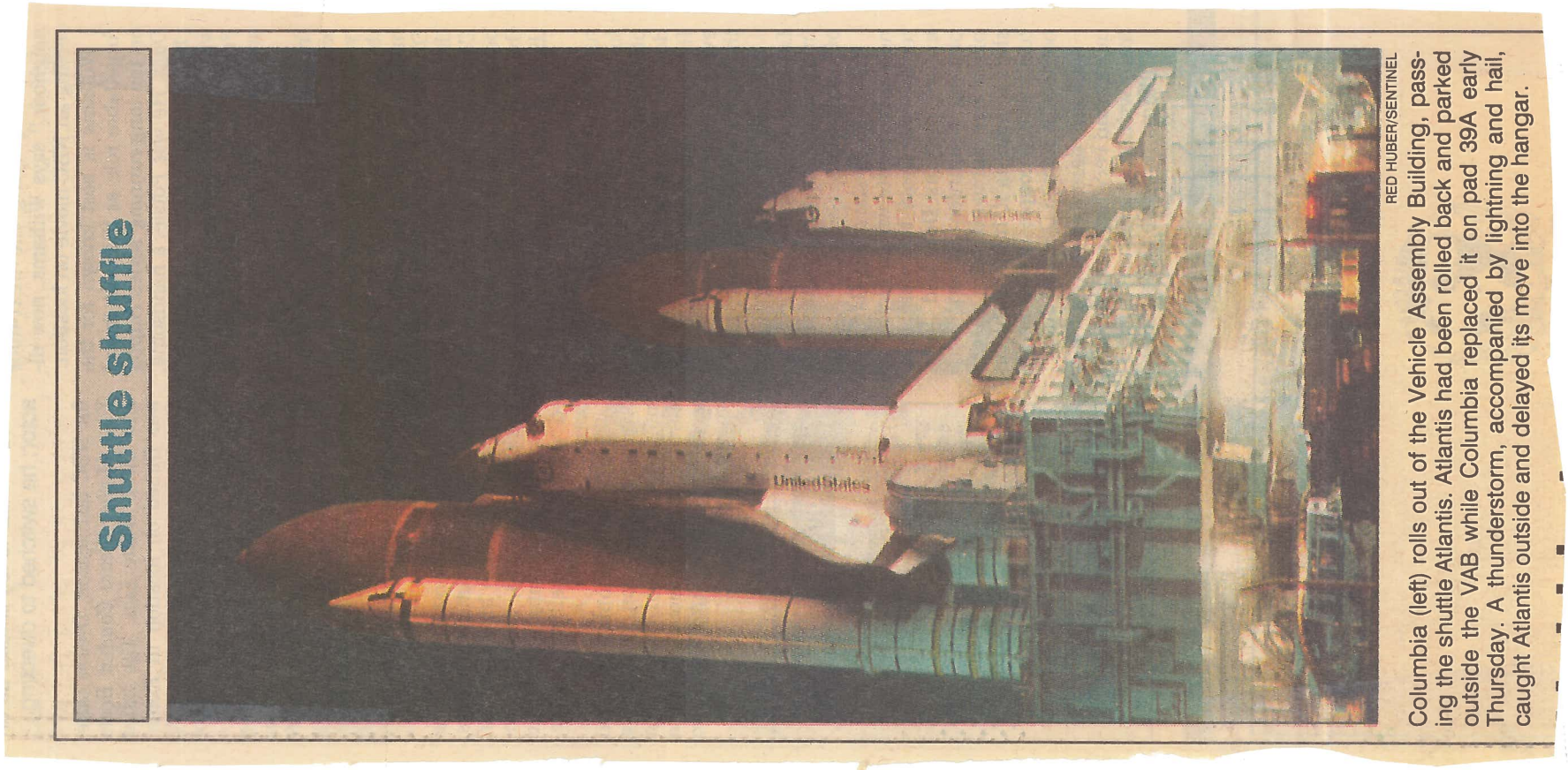
NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-35

The STS-35 crew members: Vance Brand, Mission Commander (center front); Guy S. Gardner, Pilot (left seated); (back left to right) Robert A. R. Parker, Mission Specialist; Ronald A. Parise, Payload Specialist; Jeffrey A. Hoffman, Mission Specialist; Samuel T. Durrance, Payload Specialist; and John M. "Mike" Lounge, Mission Specialist (right seated).


United States

KENNEDY SPACE CENTER, Fla. -- The Space Shuttle Columbia (left, and moving to its left) passes Atlantis on its way to Pad A, just before dawn on the morning of August 9, 1990. The Vehicle Assembly Building is out of sight to the right. Two of the louvered windows in the Launch Control Center can be seen over the deck of the Mobile Launcher Platform carrying Atlantis, to the left of the visible solid rocket booster. This unusual transit occurred when the STS-38 Atlantis flight vehicle was returned to the VAB for destacking, while the STS-35 Columbia ASTRO-1 payload was being taken to Pad A.



Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

The 34th Space Shuttle launch lit up the darkness of the early morning Space Coast sky on February 28, 1990. It was an outstanding launch - an achievement of which all of us can be proud.

It is my pleasure to forward to you the official mission decal and crew photograph of STS-36, the sixth mission of the orbiter Atlantis (OV-104). This second launch of the new year has us on track to accomplish an ambitious schedule in support of the nation's space program during 1990.

Our team performed admirably in readying Atlantis for return to orbit following its historic Galileo deployment flight in October. Approximately 20 modifications were completed in the Orbiter Processing Facility prior to rolling over to the Vehicle Assembly Building on January 19th for mating to the External Tank and Solid Rocket Boosters. Atlantis arrived at Pad 39-A on January 25th and successfully completed a Terminal Countdown Demonstration Test on February 2nd and 3rd. It was our second launch from Pad 39-A following last year's modifications and extensive enhancements. Every phase of the processing was a quality operation in a "safety first" environment.

As you know, STS-36 was a classified mission for the Department of Defense with mission Commander John Creighton and his crew of four on board. You have my gratitude for another job well done!

Doug Sargent

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-36

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-36

The STS-36 crew members: John O. Creighton, Mission Commander (center); John H. Casper, Pilot (second left); Pierre J. Thuot, Richard M. Mullane, and David C. Hilmers, Mission Specialists (left to right).

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

Congratulations to everyone on the team for the successful launch of Atlantis and the Gamma Ray Observatory!

This mission, STS-37, was an outstanding success and I'd like to extend my personal thanks to everyone for a job well done.

STS-37, launched on April 5th, was the eighth flight for Atlantis and, in my opinion, one of the more important missions we've flown so far. Performing flawlessly, the crew deployed the Gamma Ray Observatory (GRO), at 35,000 lbs., the heaviest satellite yet deployed for low earth orbit. During its two year mission, GRO will provide a tremendous amount of new information which will help scientists better understand the forces which created the universe.

Obviously, this is an extremely important mission and certainly one that all of us can be proud to have been a part of.

I am confident that the rest of the launch schedule for 1991 will be accomplished with the same great professionalism and dedication that made STS-37 the outstanding success it was.

Thanks again to everyone!

Sincerely,

Doug Sargent

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-37

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-37

The STS-37 crew members: Steven R. Nagel, Mission Commander (center front); Kenneth D. Cameron, Pilot (left seated); Mission Specialists Linda M. Godwin (right seated), Jay Apt (back left), and Jerry L. Ross (back right).

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

Resembling its preceding night launch of February 28th, the November 15th launch of Atlantis (OV-104) on mission STS-38 lit up the Space Coast sky and culminated another successful shuttle processing flow -- one in which the entire SPC Team can take well-earned pride.

Because STS-38 was a classified Department of Defense mission, details of the flight and payload were not revealed. However, each of you can be assured that your conscientious attention to detail and vigilant regard for safety and quality contributed significantly to the success of this mission.

The SPC Team again performed professionally in preparing Atlantis for its seventh flight. You will recall that hydrogen leaks created the need to roll back from the launch pad adding additional requirements and responsibilities for the SPC Team. While the leaks were being repaired, several other major tasks were accomplished. All of these accomplishments were achieved safely, with high quality and within or ahead of provided time frames, demonstrating that commitment and teamwork do pay off.

Once again, you have demonstrated an ability to meet and overcome obstacles and perform in an outstanding manner. The enclosed crew photograph and mission decal should serve as reminders of our achievements in providing Mission Commander Dick Covey and his four crew members a reliable vehicle and the safest flight possible. My sincere appreciation is extended to each of you for another excellent mission!

Doug Sargent

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-38

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-38

The STS-38 crew members: Richard O. Covey, Mission Commander (front right); Frank L. Culbertson, Jr., Pilot (front left); (back left to right) Charles D. (Sam) Gemar, Robert C. Springer, and Carl J. Meade, Mission Specialists.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

With the successful liftoff of Discovery, the SPC team again proved its capability to deliver a quality product to NASA and the seven astronaut crew. This mission helped us continue on our course for the year as the second of six space shuttle missions planned to process and launch in 1991.

On its 12th flight, Discovery took a Department of Defense payload into space. During orbit, Mission Commander Mike Coats and his crew worked with the Air Force Program 675 (AFP-675), the Infrared Background Signature Survey (IBSS), the Space Test Program, 01 (STP-01) and the Multi-Purpose Experiment Canister (MPEC). Joining Commander Coats for this important mission was pilot Blaine Hammond and Mission Specialists Greg Harbaugh, Don McMonagle, Guy Bluford, Rick Hieb and Lacy Veach.

I want to thank you for the extra effort given during the rollback and modification which was required as a result of the ET umbilical door hinge cracks, as well as the exceptional team performance in the main engine sensor change-out. Our determination and approach to correcting these problems allowed for a safe, successful launch.

This was the 40th space shuttle mission since flight operations began in 1981. Thirty of those missions were processed and launched by the SPC team. You can take well-earned pride in your professional contributions which made this record of achievement possible. The enclosed crew photograph and mission decal should serve as reminders of your personal involvement with the successful launch and recovery of Discovery.

I extend my sincere appreciation and congratulations to you for your diligence, dedication and outstanding performance. We have a great year ahead of us!

Sincerely,

E. D. Sargent
President

LOOK TO LOCKHEED FOR LEADERSHIP

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-39

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-39

The STS-39 crew members: (left to right) Charles Lacy Veach, Mission Specialist; Donald R. McMonagle, Mission Specialist; Gregory J. Harbaugh, Mission Specialist; Michael L. Coats, Mission Commander; L. Blaine Hammond, Jr., Pilot; Richard J. Hieb, Mission Specialist; and Guion S. Bluford, Jr., Mission Specialist.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

What an outstanding Spring we have had in the SPC!

When Columbia and her STS-40 crew roared into space on the morning of June 5, the SPC team had ample reason to celebrate. We had dealt with a series of delays caused by hardware problems and successfully launched this important Space Life Sciences Laboratory mission. Also, thanks to excellent planning, great professionalism and a lot of hard work, a number of significant processing records were set in recent months.

- For the period since return to flight we have recently achieved the following milestones:
  - The shortest time for an SRB stack - 22 days (STS-40)
  - The shortest time between two launches - 17 days (STS-38 and STS-35)
  - The shortest time for an orbiter mate - 5 days (STS-39)
  - The shortest time for pad operations - 21 days (STS-39)

In our business, such milestones are not just "nice to have" mentions in the record book. These records are dramatic proof that all our initiatives to streamline the process are, in fact, working and paying great dividends.

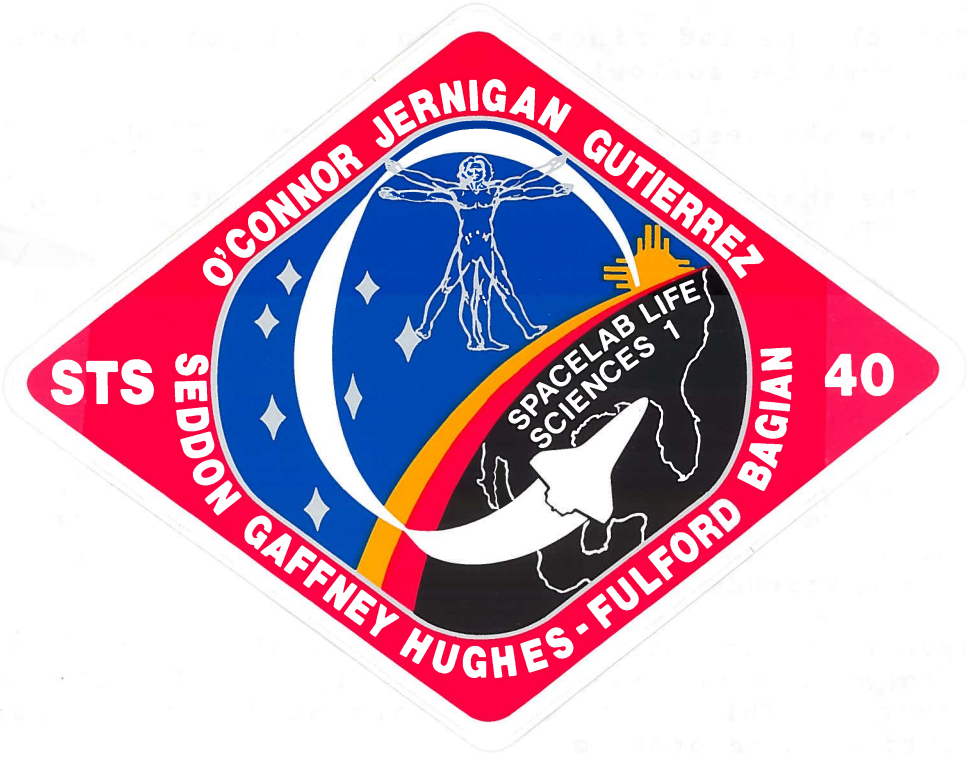
Such efficiencies can pave the way to scheduling more launches each year and enhancing the overall capacity and effectiveness of the Shuttle program. This is really important for the future of our nation's entire space program.

You and your colleagues have made all these achievements possible and I'd like to extend my personal thanks for a job well done.

Sincerely,

E. D. Sargent
President

LOOK TO LOCKHEED FOR LEADERSHIP


O'CONNOR JERNIGAN GUTIERREZ
STS
SEDDON GAFFNEY HUGHES - FULFORD BAGIAN
40
SPACELAB LIFE SCIENCES 1

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-40

National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-40

The STS-40 crew members: (back left to right) Bryan O'Connor, Mission Commander; Tammy Jernigan, Mission Specialist; Sid Gutierrez, Pilot; (front left to right) Drew Gaffney, Millie Hughes-Fulford, Payload Specialists; Rhea Seddon, and Jim Bagian, Mission Specialists.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

I am extremely proud of our performance in the successful launch and recovery of the Shuttle Discovery on STS-41 which sent Ulysses on its historic space journey. In commemoration of this milestone, I am pleased to share with you the official mission decal and crew photograph.

We have encountered several disappointments since Discovery (OV-103) last lifted off from KSC earlier this year carrying the Hubble Space Telescope. I am confident that the dedication and skills of the SPC Team will overcome all remaining hurdles to successfully accomplish the remaining 1990 manifest.

The Ulysses spacecraft is on a five-year mission to explore the uncharted regions of the Sun's north and south poles. At the higher latitudes near the poles, solar wind and other phenomena such as magetic field lines are expected to be less complicated and easier to study. In addition to the solar wind, this 809-pound spacecraft will send back data on such features as solar and galactic radiation, cosmic dust, and solar/interplanetary magnetic fields.

Accompanying Discovery's five-member crew and Ulysses were ten secondary payloads. One of the more interesting mid-deck experiments was the Voice Command System (VCS). This featured use of a voice recognition device which allowed the astronauts voice control of the payload bay and aft flight deck closed circuit television system.

Since "QUALITY is the Key to Leadership in Space," I am confident that NASA and the SPC will continue to lead the world in manned space flight. I know that STS-41 Commander Dick Richards and crew join me in saying thanks for another job well done.

Doug Sargent

LOOK TO LOCKHEED FOR LEADERSHIP

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-41

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-41

The STS-41 crew members: Richard N. Richards, Mission Commander (front right); Robert D. Cabana, Pilot (front left); (back left to right) Bruce E. Melnick, Thomas D. Akers, and William M. Shepherd, Mission Specialists.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

The smooth countdown and successful launch of Discovery on STS-42 was a great way to start the new year!

STS-42 was an extremely important mission because it marked the beginning of an international research program which will explore the complex effects weightlessness has on living organisms and materials processing. Obviously, this research has major implications for the space station and future interplanetary missions. Also, this mission was the very first one which utilized our new, "state of the art", Orbiter Processing Facility - Bay 3.

As you know the SPC had an outstanding year in 1991 - culminated by our receiving the highest award fee evaluation at KSC since our contract began back in 1983. However, as we've said many times, we can never rest on our laurels - the work ahead will always be tremendously challenging.

Our SPC challenge is to make each of the seven remaining shuttle missions in 1992 more streamlined and efficient than the last.

Let's do it!

Sincerely,

Gerry Oppiger
President

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-42

NASA National Aeronautics and Space Administration

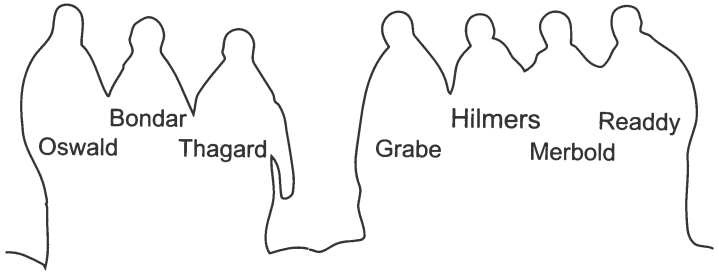
The Crew of Space Shuttle Mission STS-42

Commander
Ronald J. Grabe (Col., USAF)

Ronald Grabe was born in New York, New York. He earned a bachelor of science degree in engineering science from the United States Air Force Academy and studied aeronautics as a Fulbright Scholar at the Technische Hochschule, Darmstadt, West Germany. Upon his return from West Germany, Grabe completed pilot training and flew the F-100 in 200 combat missions in Vietnam. Grabe attended the USAF Test Pilot School and served as a test pilot for the A-7 and F-111. Grabe later served as an exchange test pilot with the Royal Air Force in the United Kingdom in the development programs for the Royal Air Force Harrier and the Royal Navy Sea Harrier. He has logged over 5,000 hours of flying time. Before being selected as a NASA astronaut, Grabe was an instructor at the USAF Test Pilot School. Grabe served as the pilot on the STS 51-J and STS-30 missions.

Pilot
Stephen S. Oswald

Stephen Oswald was born in Seattle, Washington but considers Bellingham, Washington his hometown. Oswald graduated from the U.S. Naval Academy. He became a naval aviator and flew the Corsair II aboard the USS Midway. Oswald then attended the U.S. Naval Test Pilot School and conducted flying quality, performance, and propulsion studies on the A-7 and F/A-18 Hornet. He then became an F/A-18 instructor and later a catapult officer aboard the USS Coral Sea. Oswald resigned from active duty and joined Westinghouse Electric Corporation as a civilian test pilot. He has logged over 5,000 hours of flying



time in 40 different kinds of aircraft. Oswald joined NASA as an aerospace engineer and research pilot. The STS-42 mission will be his first space flight.

Payload Commander
Norman E. Thagard (M.D.)

Norman Thagard was born in Marianna, Florida but considers Jacksonville, Florida to be his hometown. He earned bachelor and master of science degrees in engineering science from Florida State University and a doctor of medicine degree from the University of Texas Southwestern Medical School. Before attending medical school, Thagard joined the U.S. Marine Corps Reserve and became a naval aviator. He flew 163 combat missions in Vietnam. Upon his return to the United States, Thagard was assigned as an aviation weapons division officer. He has logged over 2,200 hours of flying time. As a NASA astronaut, Thagard has flown in space three times on the STS-7, STS 51-B, and STS-30 missions.

Mission Specialist
David C. Hilmers (Lt. Col., USMC)

David Hilmers was born in Clinton, Iowa but considers DeWitt, Iowa to be his hometown. Hilmers earned a bachelor of arts degree in mathematics from Cornell College, a master of science degree in electrical engineering, and the degree of electrical engineer from the U.S. Naval Postgraduate School. He joined the U.S. Marine Corps and attended the Naval Flight Officer School. He flew as a bombadier-navigator and then became an air liaison officer serving in the Mediterranean. Hilmers has flown in space three times on the STS 51-J, STS-26, and STS-36 missions.

Mission Specialist
William F. Readdy

William Readdy was born in Quonset Point, Rhode Island but considers McLean, Virginia to be his hometown. He earned a bachelor of science degree in aeronautical engineering from the U.S. Naval Academy. Upon his graduation from the academy, Readdy became a naval aviator and served aboard the USS Forrestal in the North Atlantic and Mediterranean. He then attended the U.S. Naval Test Pilot School. After serving as a test pilot instructor, he became a strike operations officer, flying A-6 and F/A-18 Hornet aircraft. Readdy joined NASA as a research pilot before becoming an astronaut. He has logged over 5,000 hours in more than 50 types of fixed wing aircraft and helicopters. STS-42 will be his first space mission.

Payload Specialist
Ulf Merbold (Ph.D.)

Ulf Merbold was born in Greitz, Germany. He earned physics degrees at Stuttgart University. Merbold joined the Max-Planck-Institut for Metals Research in Stuttgart and studied solid state physics and low-temperature physics. He was selected by the European Space Agency as a payload specialist for the Spacelab-1 (STS-9) mission. He also served as a crew interface coordinator for the D-1 Spacelab mission (STS 61-A). Merbold was then transferred to the European Space Technology Center to work in the planning for the Columbus module for Space Station *Freedom*. He then became the head of the DLR astronaut office until he started to train for the IML-1 mission. This will be his second space flight.

Payload Specialist
Roberta L. Bondar (Ph.D., M.D.)

Roberta Bondar was born in Sault Ste. Marie, Ontario, Canada. She earned a bachelor of science degree in zoology and agriculture from the University of Guelph, a master of science degree in experimental pathology from the University of Western Ontario, and a doctorate in neurobiology from the University of Toronto. She has also earned a doctor of medicine degree from McMaster University and was admitted as a Fellow of the Royal College of Physicians and Surgeons of Canada in neurology. Bondar is a neurologist and a clinical and basic science researcher. She is studying cerebral auto-regulation in microgravity. Bondar joined the Canadian Space Agency in 1983 and served as chairperson of the Canadian Lifesciences Subcommittee for Space Station. This will be her first space flight.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

As you know, at the conclusion of each Shuttle mission, I have extended my personal thanks and congratulations to each member of the SPC Team for a job well done. Certainly, every mission we launch is very important, but I think STS-43 merits special thanks and recognition.

As you all know, we have worked extremely hard to find ways to streamline Shuttle processing and during the STS-43 flow many of these initiatives came together to produce a return-to-flight era record for the quickest OPF processing. This was a truly significant achievement as we prepared Atlantis for its mission of deploying the fourth of the huge, complex Tracking and Data Relay Satellites.

It was particularly gratifying to me that this outstanding success was achieved on the 25th (and last) shuttle we prepared for launch during my tenure as SPC Program Manager. This was a great way to "launch" myself into my retirement years!

I will always be proud to have served with you during this exciting six year period and forever grateful for your superb and unflagging support.

You have my very best wishes for continued success.

Sincerely,

Doug

Doug Sargent

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-43

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-43

The STS-43 crew members (left to right) Shannon W. Lucid, Mission Specialist; James C. Adamson, Mission Specialist; John E. Blaha, Mission Commander; G. David Low, Mission Specialist; and Michael A. Baker, Pilot.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

The successful launch of Atlantis on the STS-44 mission, the deployment of a vital Department of Defense satellite and the landing at Edwards Air Force Base on December 1, culminated a truly outstanding year for the nation's Space Shuttle Program and the Shuttle Processing Team.

You and your teammates made this great year possible and I'd like to express my personal appreciation for all you have achieved.

Consider what we accomplished in 1991:

- Six successful Shuttle launches
- The opening of OPF-3
- An unplanned, short notice landing at KSC (STS-39)
- Processing our new orbiter, Endeavour, for its first flight
- Records for return to flight era processing in the OPF - 59 days (STS-43)
- Setting a record for SRB stacking - 21 days (STS-44)

And these are just some of the highlights!

Certainly all of us can be justly proud of these and all the other milestones we reached in 1991.

Every member of our team plays his or her part and everyone is to be commended.

Obviously, 1992 will be an equally challenging year, but I am confident that you and your colleagues will once again perform in an exemplary manner.

Again, thanks for the outstanding work.

I'd also like to take this opportunity to wish you and your family a very happy, safe, and rewarding holiday season.

Sincerely,

Gerry Oppliger
President

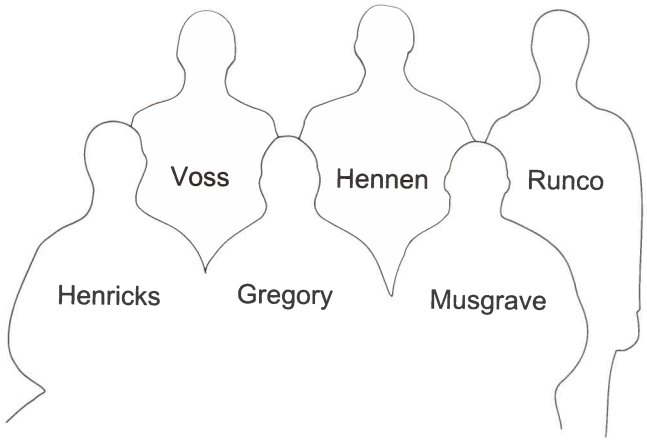
LOOK TO LOCKHEED FOR LEADERSHIP

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-44

NASA National Aeronautics and Space Administration

The Crew of Space Shuttle Mission STS-44



Commander
Frederick D. Gregory (Col., USAF)
Frederick Gregory was born in Washington, D.C. He earned a Bachelor of Science degree from the United States Air Force Academy and a master's degree in Information Systems from George Washington University. Upon graduation from the Air Force Academy, Gregory completed pilot training and served as a helicopter rescue pilot in Vietnam. He later received jet training and flew the F-4. Gregory then became a test pilot, following graduation from the Navy Test Pilot school in 1971, and flew test missions in both jets and helicopters for the Air Force and NASA. He has flown approximately 7,000 hours in more than 50 types of aircraft. In 1978, Gregory was selected as an astronaut. He has flown in space twice as the pilot on the STS-51B/ Spacelab-3 mission and as the commander on the STS-33 mission.

Pilot
Terence T. "Tom" Henricks (Col., USAF)
Tom Henricks was born in Bryan, Ohio but considers Woodville, Ohio to be his hometown. He received a Bachelor of Science degree in Civil Engineering from the U.S. Air Force Academy in 1974 and a master's degree in Public Administration from Golden Gate University in 1982. Upon graduation from the Air Force Academy, Henricks completed pilot training and flew in F-4 fighter aircraft in England, Iceland, and the U.S. He is a graduate of the Air Force's Fighter Weapons and Test Pilot Schools. He was an F-16C test pilot prior to his selection as a NASA astronaut. He has logged 747 parachute jumps and over 3,500 hours flying time in jet aircraft. This is his first space flight.

Mission Specialist
James S. Voss (Lt. Col., USA)
Jim Voss was born in Cordova, Alabama but considers Opelika, Alabama to be his hometown. He earned a Bachelor of Science degree in Aerospace Engineering from Auburn University and a Master of Science degree in Aerospace Engineering Sciences from the University of Colorado. After completing Airborne and Ranger training, Voss served as an infantry platoon leader, intelligence staff officer, and company commander in Germany. He graduated from the U.S. Naval Test Pilot School and served as an Army Flight Test Engineer. At NASA, Voss worked as a Vehicle Integration Test Engineer before becoming an astronaut in 1987. This will be his first space flight.

Payload Specialist
Thomas J. Hennen, (Chief Warrant Officer, USA)
Thomas Hennen was born in Albany, Georgia but considers Columbus, Ohio to be his hometown. He attended Urbana College and received extensive training from the U.S. Army in the field of image analysis. Hennen has over 18 years of experience as an operational imagery analyst at both the national and tactical intelligence levels. In addition, he has experience as a training, force, and combat developer as well as an extensive background in materiel development and acquisition management. This will be his first space flight.

Mission Specialist
Mario Runco, Jr. (LCDR., USN)
Mario Runco was born in the Bronx, New York but considers Yonkers, New York to be his hometown. He earned a Bachelor of Science degree in Meteorology and Physical Oceanography from the City College of New York and a Master of Science degree in Meteorology from Rutgers University. Upon graduation from Rutgers, Runco worked as a research hydrologist for the U.S. Geological Survey. He then joined the New Jersey State Police and worked as a New Jersey State Trooper until he entered the U.S. Navy. In the U.S. Navy, Runco was first assigned as a research meteorologist and then served aboard USS NASSAU (LHA-4) where he earned his designation as a Surface Warfare Officer. He later taught the Geophysics Technical Readiness Laboratory course at the Naval Postgraduate School. As Commanding Officer of Oceanographic Unit Four embarked in USNS CHAUVENET (T-AGS-29), he led hydrographic and oceanographic surveys of the Java Sea and Indian Ocean. Runco was selected as a NASA astronaut in 1987. This will be his first space flight.

Mission Specialist
Story Musgrave (M.D.)
Story Musgrave was born in Boston, Massachusetts but considers Lexington, Kentucky to be his hometown. Musgrave joined the U.S. Marine Corps and served as an aviation electrician, instrument technician, and aircraft crew chief. He later enrolled at Syracuse University and earned a Bachelor of Science degree in Mathematics and Statistics. At the University of California at Los Angeles he earned a Master of Business Administration degree in Operations Analysis and Computer Programming. He also earned a Bachelor of Arts degree in Chemistry from Marietta College and a doctorate in Medicine from Columbia University. At the University of Kentucky, Musgrave received a Master of Science degree in Physiology and Biophysics and at the University of Houston he received a Master of Arts degree in Literature. He did his surgical internship at the University of Kentucky Medical Center and conducted research in aerospace medicine. Musgrave has earned U. S. Air Force wings and several FAA ratings, including airline transport pilot, and is an accomplished parachutist. He has flown more than 17,000 hours in 160 types of aircraft. Musgrave became a NASA scientist-astronaut in 1967. He was a backup science-pilot for the first Skylab mission and has flown in space three times as a mission specialist on the STS-6, STS-51-F, and STS-33 missions.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Teammates,

STS-45 was an outstanding mission and a great part of that success was due to the exceptional performance of the entire SPC Team!

We moved Atlantis through the OPF in just 55 days -- a record for the return-to-flight era and four full days better than the previous mark. As in the past, safety remained our uppermost priority and, during this flow, we had no PERs (Preliminary Evaluation Reports). A truly noteworthy achievement.

The payload for this mission was the Atmospheric Laboratory for Applications and Science (ATLAS-1). ATLAS-1 is the first of a series of 12 instruments which will be flown during the 11-year solar cycle to provide information on the chemical composition of our atmosphere including the ozone layer. As we learn more about the solar forces and the chemical molecules that impact our climate, we will be better able to predict vital global atmospheric changes.

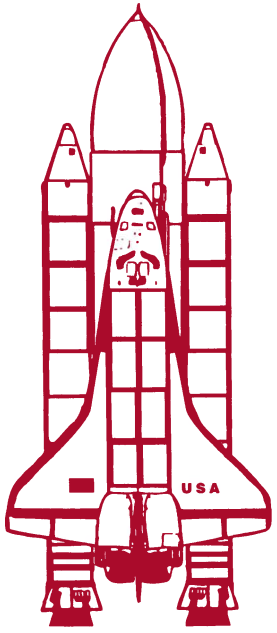
Certainly, we can all be proud to be a part of such an important project.

And speaking of "pride", I have thought for a long time that all of us in the SPC Team should take a lot of pride in being an important part of our country's space program here at Kennedy Space Center -- America's Spaceport. In that regard, I hope that you will consider displaying the bumper sticker which we have enclosed along with the STS-45 crew photo and mission decal.

Thanks again for a job well done!

Sincerely,

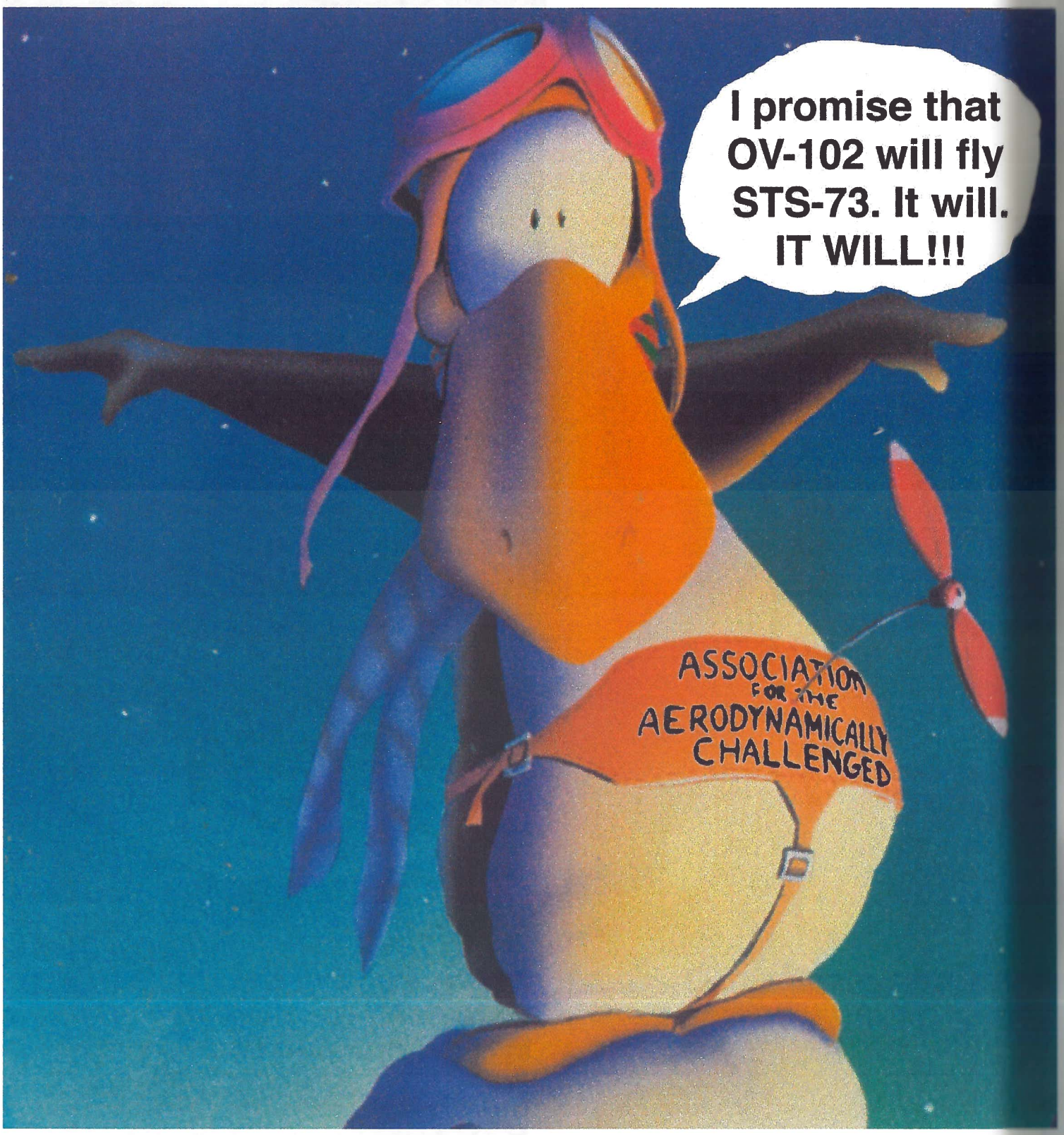
Gerry Oppliger
President



PROUD TO BE AT KSC !

Lockheed Space Operations Company

Penguin dreams, of wings and things.
Of seaside perches and Orbital tableaus.



National Aeronautics and Space Administration

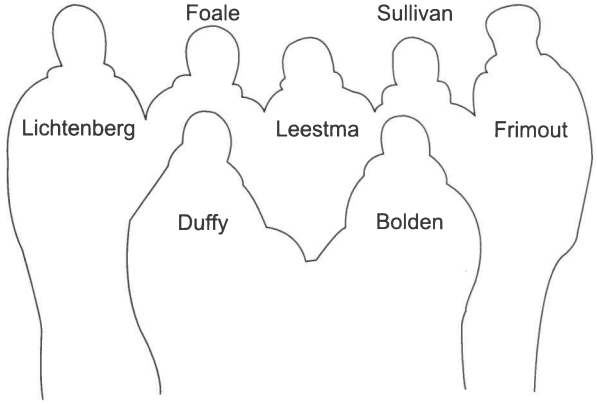
Crew of Space Shuttle Mission STS-45

NASA National Aeronautics and Space Administration

Commander
Charles F. Bolden, Jr. (Col., USMC)
Charles Bolden was born in Columbia, South Carolina. He earned a bachelor of science degree in electrical science from the United States Naval Academy and a master of science in systems management from the University of Southern California. After graduating from the Naval Academy, Bolden accepted a commission in the U.S. Marine Corps. As a naval aviator, he flew more than 100 sorties into North and South Vietnam, Laos, and Cambodia, in the A-6A Intruder. Following his return to the United States, Bolden graduated from the U.S. Naval Test Pilot School at Patuxent River, Maryland, served as an ordnance test pilot, and flew numerous test projects in the A-6E, EA-6B, and A-7C/E airplanes. He has logged more than 5,000 hours flying time. Bolden became an astronaut in 1981 and has flown in space twice, as pilot of the STS-61C and STS-31 missions.

Pilot
Brian Duffy (Lt. Col., USAF)
Brian Duffy was born in Boston, Massachusetts. He received a bachelor of science degree in mathematics from the U.S. Air Force Academy and a master of science degree in systems management from the University of Southern California. After graduation from the Air Force Academy, Duffy completed undergraduate pilot training and was selected to fly the F-15. Later, following graduation from the U.S. Air Force Test Pilot School, he served as the Director of F-15 Tests at Eglin Air Force Base, Florida. Duffy became an astronaut in 1986. This is his first space flight.

Mission Specialist and Payload Commander
Kathryn D. Sullivan (Ph.D., Geology)
Kathryn Sullivan was born in Paterson, New Jersey, but considers Woodland Hills, California her home. She earned a bachelor of science degree in Earth sciences from the University of California, Santa Cruz, and a doctorate in geology from Dalhousie University (Halifax, Nova Scotia). Dr. Sullivan is an oceanography officer in the U.S. Naval Reserve, currently holding the rank of Lieutenant Commander. She is a private pilot, rated in powered and glider aircraft. Dr. Sullivan is also an Adjunct Professor of Geology at Rice University, Houston, Texas. Dr. Sullivan became an astronaut in 1979 and is a two-flight veteran. She has served as a mission specialist on STS-41G and on STS-31. She was the first U.S. woman to perform an extravehicular activity (STS-41G). Since joining NASA, her research interests have focused on remote sensing and planetary geology.



Mission Specialist
David C. Leestma (Capt., USN)
David Leestma was born in Muskegon, Michigan. He graduated first in his class from the U.S Naval Academy and earned a master of science degree in aeronautical engineering from the U.S. Naval Postgraduate School. He then reported to the Naval Air Station, Pensacola, Florida, where he completed flight training and received his wings. Leestma made three overseas deployments to the Mediterranean/North Atlantic areas while flying aboard the USS *John F. Kennedy*. Later, as an operations test director with the F-14A, he conducted the first operational testing of new tactical software for the F-14 and completed the follow-on test and evaluation of new F-14A avionics. He has logged over 3,000 hours of flight time, including nearly 1,500 hours in the F-14A. Leestma served as a mission specialist on the crews of STS-41G and STS-28. During STS-41G, Leestma and Kathryn Sullivan successfully conducted a 3-1/2 hour extravehicular activity.

Mission Specialist
Michael Foale (Ph.D., Lab. Astrophysics)
Michael Foale was born in Louth, England, but considers Cambridge, England, to be his hometown. He attended the University of Cambridge, Queens' College, receiving a bachelor of arts degree in physics, National Sciences Tripos, with first class honors. While at Queens' College, he completed his doctorate in laboratory astrophysics. As a postgraduate at Cambridge University, Foale participated in the organization and execution of scientific scuba diving projects, including surveying underwater antiquities in Greece. Foale joined NASA Johnson Space Center in 1983 in the payload operations area of the Mission Operations Directorate. He was selected as an astronaut candidate in 1987 and completed a one-year training and evaluation program in 1988. This is his first space flight.

Payload Specialist
Byron K. Lichtenberg (Sc. D., Biomedical Engineering)
Byron Lichtenberg was born in Stroudsburg, Pennsylvania. He received a bachelor of science degree in aerospace engineering, cum laude, from Brown University; a master of science degree in mechanical engineering from MIT; and a doctor of science degree in biomedical engineering from MIT. Upon receiving his undergraduate degree, Lichtenberg entered the Air Force and attended the Undergraduate Pilot Training School at Williams Air Force Base, Arizona. He has logged over 3,000 hours in fighter aircraft, 138 combat missions, and currently flies the A-10 with the Massachusetts Air National Guard. His doctoral research on the inner ear system led to experiments that flew aboard STS-9 (Spacelab-1), on which he served as the U.S. flight payload specialist in 1983.

Payload Specialist
Dirk D. Frimout (Dr. in Applied Physics)
Dirk Frimout was born in Poperinge, Belgium. He received the degree of electrotechnical engineer at the State University of Ghent (Belgium) and a doctorate in applied physics from the University of Ghent. He performed a post-doctorate at the University of Colorado, Laboratory of Atmospheric and Space Physics. Dr. Frimout is senior engineer in the Payload Utilization Department of the Columbus Directorate of the European Space Agency (ESA) and has been responsible for ESA support to the European experiments on Atlas-1 since 1985. He was selected as the flight payload specialist in 1991. This is Dr. Frimout's first space flight.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Team Member,

Five up and four to go! With the successful launch and recovery of Atlantis and the STS-46 mission, we moved past the mid-way mark of an ambitious nine mission launch schedule for 1992. I think we can all take pride in our contributions to this excellent record of achievement to date. It's obvious that there is a strong correlation between the on-time launches of superbly prepared Shuttles on highly successful missions and the record shattering high marks the Shuttle Processing Contract Team has been getting on our NASA performance evaluations.

Our team's outstanding contributions to mission success were also recognized by NASA Administrator Dan Goldin recently when he presented us with NASA's first "World Class" award. When he presented the award, Mr. Goldin said that our team had "met the challenges of processing Endeavour and of processing all the other missions while significantly reducing processing time."

That is certainly high praise and, I think, an accolade that is very well deserved.

Col. Loren Shriver and his crew conducted a number of important experiments and deployed two new retrievable payloads during the STS-46 mission. You and your SPC teammates made their accomplishments possible.

Many thanks for a job well done!

Sincerely,

Gerry Oppliger
President

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-46

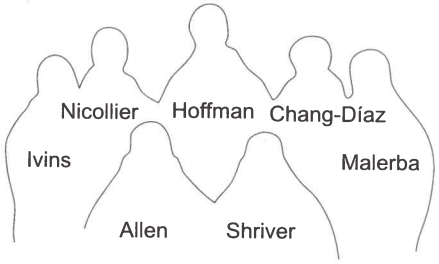
NASA National Aeronautics and Space Administration

The Crew of Space Shuttle Mission STS-46

Commander
Loren J. Shriver (Col., USAF)
Loren Shriver was born in Jefferson, Iowa, but considers Paton, Iowa, to be his hometown. He earned a bachelor of science degree in aeronautical engineering from the United States Air Force Academy and a master of science degree in astronautical engineering from Purdue University. After graduation from the Air Force Academy, Shriver served as a T-38 academic instructor pilot, and also completed F-4 combat crew training. Following an overseas tour in Thailand, he graduated from the USAF Test Pilot School at Edwards Air Force Base, California. He participated in the Air Force development tests and evaluations of the F-15 fighter and T-38 lead-in fighter aircraft. Shriver, who has logged more than 5,800 hours in jet aircraft, became an astronaut in 1979. He has twice flown in space: as pilot of Mission STS-51C and commander of Mission STS-31.

Pilot
Andrew M. Allen (Maj., USMC)
Andrew Allen was born in Philadelphia, Pennsylvania. He received a bachelor of science degree in mechanical engineering from Villanova University. Following graduation from the United States Marine Corps flight school, he flew F-4 Phantoms and was later selected by USMC Headquarters for fleet introduction of the F/A-18 Hornet. Allen also is a graduate of the Navy Fighter Weapons School (Top Gun) and the U.S. Navy Test Pilot School. He has logged over 4,000 flight hours in more than 30 different aircraft. He became an astronaut in 1988.

Mission Specialist
Jeffrey A. Hoffman (Ph.D.)
Jeffrey Hoffman was born in Brooklyn, New York, but considers Scarsdale, New York, to be his hometown. He earned a bachelor of arts degree in astronomy from Amherst



College, a doctor of philosophy degree in astrophysics from Harvard University, and a master of science degree in materials science from Rice University. After receiving his Ph.D., he worked at Leicester University in England and at the Massachusetts Institute of Technology in the field of X-ray astronomy. He became an astronaut in 1979. He has worked on the testing of Shuttle guidance, navigation, and control systems; crew training; the development of satellite deployment procedures; payload safety; and the development of advanced, high-pressure space suits. He has twice flown in space: as mission specialist on STS-51D, where he made a contingency space walk, and as a mission specialist on the STS-35 Astro-1 mission.

Mission Specialist
Franklin R. Chang-Díaz (Ph.D.)
Franklin Chang-Díaz was born in San Jose, Costa Rica. He earned a bachelor of science degree in mechanical engineering from the University of Connecticut and a doctorate in applied plasma physics from the Massachusetts Institute of Technology. During graduate school at MIT, he worked in the United States' controlled fusion program, doing research in the design and operation of fusion reactors. After being selected as an astronaut, he was appointed Visiting Scientist with the MIT Plasma Fusion Center where he leads the Plasma Propulsion Group. He travels there periodically to continue his research on advanced plasma rockets. While living in Massachusetts, he also worked as a house manager in a program for deinstitutionalizing chronic mental patients, and as an instructor/advisor with a rehabilitation program for Hispanic drug abusers. He has logged over 1,500 hours of flight time. Chang-Díaz was named an astronaut in 1981. He has twice flown in space: as mission specialist on STS-61C and STS-34.

Mission Specialist (ESA)
Claude Nicollier
Claude Nicollier was born in Vevey, Switzerland. He holds a bachelor of science degree in physics from the University of Lausanne and a master of science degree in astrophysics from the University of Geneva. In 1978, he was selected by the European Space Agency (ESA) as a payload specialist to train for the Spacelab-1 mission. Under an agreement between ESA and NASA, he joined the astronaut candidate class of 1980 to begin training as a mission specialist. He holds a commission as captain in the Swiss Air Force and has logged 4,650 hours flying time, including 3,200 hours in jet aircraft. He also flew DC-9s for three years (1974-1976), and is a 1988 graduate of the Empire Test Pilot's School.

Mission Specialist
Marsha S. Ivins
Marsha Ivins was born in Baltimore, Maryland. She earned a bachelor of science degree in aerospace engineering from the University of Colorado. She worked as an engineer in Man Machine Engineering, as a flight simulation engineer on the Shuttle Training Aircraft, and as co-pilot of the NASA administrative aircraft at the Johnson Space Center before being selected as an astronaut in 1984. Ivins, who has logged more than 4,700 hours in civilian and NASA aircraft, flew as a mission specialist on STS-32 in January 1990 and logged 261 hours in space.

Payload Specialist (ESA)
Franco Malerba (Ph.D.)
Franco Malerba was born in Genova, Italy. He received two doctorate degrees from the University of Genova: one in electronics engineering and telecommunications and the other in physics. During post doctoral work at the Italian National Research Council in Camogli and at the National Institutes of Health in Bethesda, Maryland, he developed and used experimental techniques of fast spectrophotometry for research on photoreceptors. In 1977, he was chosen by the European Space Agency as a payload specialist candidate for the first mission of Spacelab and worked at the ESA-ESTEC technical center in Noordwijk, The Netherlands, on the development of the space plasma physics experiment "PICPAB" which flew aboard the first Spacelab (STS-9) mission. Malerba has also done extensive work in computer networks engineering and telecommunications technology, and has served as a reserve officer in the Italian Navy.

STS-46 Crew Insignia
The Space Shuttle *Atlantis* is shown orbiting Earth. Extending from *Atlantis*'s payload bay is the Tethered Satellite System. Next to *Atlantis* is the European Retrievable Carrier satellite that will be deployed for a 10-month scientific mission. The last names of the crew members circle the insignia. At the bottom are the flags for the United States and Italy and the ESA logo.

National Aeronautics and
Space Administration

John F. Kennedy Space Center
Kennedy Space Center, Florida 32899

NASA

Reply to Attn of CD

SEP 0 3 1992

Dear KSC Team Member:

The enclosed picture captures a unique, highly symbolic moment--the sailing of replicas of three of the most famous names in exploration past a remarkable new ship, waiting to claim its own place in history. *Santa Maria* leads *Nina* and *Pinta* past Orbiter Endeavour on Pad B, just one day before the new vessel launched on its first voyage into space.

This small fleet made the most important discovery of its century, sighting chains of islands close to the coastlines of two vast new continents. Endeavour, too, explored at the borders of huge and uncharted territories on its first flight, the endless frontiers of space, science and technology.

During this 500th year since the discovery of the lands that became our home, it is fitting and proper to pause and appreciate anew the courage and perseverance of the "explorers" who discovered America. As we move toward the 21st century, and deeper into the age of the exploration of space, let us not forget the debt we owe those who preceded us on difficult and dangerous voyages. It is up to us to uphold the proud tradition of exploring the unknown that is so much a part of the legacy we have inherited.

Robert L. Crippen

Robert L. Crippen

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Members,

When Endeavour completed her maiden space flight back on the 16th of May, I was proud to report to you that our newest orbiter had performed flawlessly.

Now, with the conclusion of Endeavour's second mission, STS-47, that record of outstanding performance still holds. Capt. "Hoot" Gibson and his crew report that the orbiter was in top-notch condition. Everyone on the Shuttle Processing Contract (SPC) team can be proud of the part they played in preparing Endeavour for this important second mission.

On STS-47, the 50th Space Shuttle mission, U.S. and Japanese scientists conducted materials sciences and life sciences experiments and operated Spacelab-J "around the clock" in a Spacelab module which served as a pressurized laboratory in space.

In terms of personnel, the STS-47 crew laid claim to a number of "firsts":

- Dr. Mae Jemison became the first African-American woman in space
- Dr. Mamoru Mohri was the first Japanese native to fly on the Space Shuttle
- Lt. Col. Mark Lee and his wife, Dr. N. Jan Davis became the first married couple to fly on the same mission.

This outstanding crew - as well as the space community of the world - owes a debt of gratitude to you and your SPC colleagues for the great job of getting Endeavour ready to fly.

Many thanks for a job well done!

Sincerely,

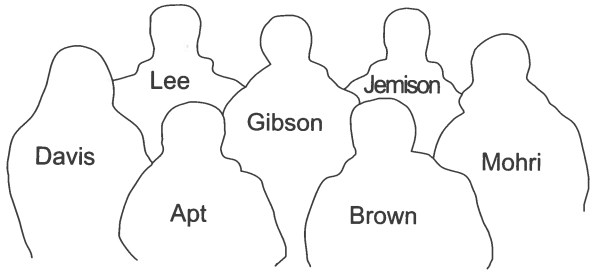
Gerry Oppliger
President

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-47

NASA National Aeronautics and Space Administration

The Crew of Space Shuttle Mission STS-47



Commander
Robert L. Gibson (Capt., USN)
Robert Gibson was born in Cooperstown, New York, but considers Lakewood, California, to be his hometown. He earned a bachelor of science degree in aeronautical engineering from California Polytechnic State University. Following graduation, he entered active duty with the Navy. Gibson flew combat missions in Southeast Asia, serving aboard the USS Coral Sea and USS Enterprise. He later graduated from the U.S. Naval Test Pilot School at Patuxent River, Maryland, and became involved in the testing and evaluation of F-14A aircraft. He has logged more than 5,500 hours flying time and has completed over 300 carrier landings. Gibson became an astronaut in 1979. He has flown in space three times: as pilot of STS-41B and commander of the STS-61C and STS-27 flights.

Pilot
Curtis L. Brown, Jr. (Maj., USAF)
Curtis L. Brown was born in Elizabethtown, North Carolina. He received a bachelor of science degree in electrical engineering from the U.S. Air Force Academy. He flew A-10 aircraft at Myrtle Beach Air Force Base, South Carolina, before being reassigned to Davis Monthan Air Force Base, Arizona, as an A-10 instructor pilot. While an instructor pilot, he attended the USAF Fighter Weapons School and the USAF Test Pilot School. Upon graduation from the USAF Test Pilot School, he served as a test pilot in the A-10 and F-16 aircraft at Eglin Air Force Base, Florida. Brown has logged over 3,500 hours flight time in jets and has piloted more than 35 different aircraft. He was selected as an astronaut in 1987. His technical assignments to date include: upgrade of the Shuttle Mission Simulator, development of the Flight Data File, lead of the Astronaut Launch Support Team responsible for crew ingress and strap-in prior to launch and crew egress after landing.

Payload Commander
Mark C. Lee (Lt. Col., USAF)
Mark C. Lee was born in Viroqua, Wisconsin. He earned a bachelor of science degree in civil engineering from the U.S. Air Force Academy and a master of science degree in mechanical engineering from the Massachusetts Institute of Technology. While assigned to Hanscom Air Force Base, Massachusetts, his responsibilities included resolving mechanical and material defects which affected the mission readiness of the Airborne Warning and Control System aircraft. Lee flew F-16s while serving as executive officer for the 388th Tactical Fighter Wing, deputy commander for operations, and as flight commander in the 4th Tactical Fighter Squadron at Hill Air Force Base, Utah. He has logged 2,750 hours flying time, mostly in the T-38, F-4 and F-16 aircraft. Selected as an astronaut in 1984, Lee was a mission specialist aboard STS-30.

Mission Specialist
N. Jan Davis (Ph.D.)
N. Jan Davis was born in Cocoa Beach, Florida, but considers Huntsville, Alabama, to be her hometown. She earned bachelor of science degrees in applied biology from Georgia Institute of Technology and in mechanical engineering from Auburn University, and a master of science degree and a doctorate in mechanical engineering from the University of Alabama, Huntsville. As an aerospace engineer for NASA's Marshall Space Flight Center in Huntsville, she was responsible for the structural analysis and verification of the Hubble Space Telescope and the Advanced X-ray Astrophysics Facility. She was also the lead engineer for the redesign of the Solid Rocket Booster external tank attach ring. Davis was named an astronaut in 1987.

Mission Specialist
Jay Apt (Ph.D.)
Jay Apt was born in Springfield, Massachusetts, but considers Pittsburgh, Pennsylvania, to be his hometown. He received a bachelor of arts degree, magna cum laude, in physics from Harvard College, and a doctorate in physics from the Massachusetts Institute of Technology. As a staff member of Harvard's Center for Earth & Planetary Physics, he supported NASA's Pioneer Venus Mission. While at NASA's Jet Propulsion Laboratory, Apt studied Venus, Mars, and the outer solar system and was Science Manager of the Table Mountain Observatory. From 1982 until his selection as an astronaut in 1985, he was a flight controller responsible for Shuttle payload operations at NASA's Johnson Space Center. He has logged over 2,500 hours flying time in some 25 different types of airplanes, sailplanes and human-powered aircraft. Apt served as a mission specialist on the STS-37 mission during which he performed two space walks.

Science Mission Specialist
Mae C. Jemison (M.D.)
Mae Jemison was born in Decatur, Alabama, but considers Chicago, Illinois, to be her hometown. She earned both a bachelor of science degree in chemical engineering and a bachelor of arts degree in African and Afro-American studies from Stanford University, and a doctorate degree in Medicine from Cornell University. After medical school she did post graduate medical training at Los Angeles County University of Southern California Medical Center. As an area Peace Corps medical officer for Sierra Leone and Liberia in West Africa, she managed the health care delivery system for U.S. Peace Corps and U.S. Embassy personnel. Dr. Jemison's background includes work in the areas of nuclear magnetic resonance spectroscopy, reproductive biology, and printed wiring board materials. She also developed and participated in research projects on the Hepatitis B vaccine, schistosomaisis and rabies. Dr. Jemison was a General Practitioner and attending graduate engineering classes in Los Angeles when named to the astronaut program in 1987. She is a co-investigator for the Bone Cell Research Experiment on this mission. This will be the first space flight by an African American woman.

Prime Payload Specialist
Mamoru Mohri (Ph.D.)
Mamoru Mohri was born in Yoichi, Hokkaido, Japan. He earned bachelor of science and master of science degrees in chemistry from Hokkaido University, and a doctorate degree in chemistry from the Flinders University of South Australia. As a member of the faculty of Hokkaido University for ten years, he conducted research on surface physics and chemistry and on vacuum sciences. He also worked on a Japanese nuclear fusion project for eight years, and has experience working on large-scale experimental systems for plasma confinement. He was selected to participate in the first group of exchange scientists under the U.S./Japan Nuclear Fusion Collaboration Program. In 1985, Dr. Mohri was named a payload specialist by the National Space Development Agency of Japan. He has conducted microgravity experiments as an adjunct professor of the University of Alabama in Huntsville using the KC-135 aircraft and a drop tower facility at the Marshall Space Flight Center, Huntsville, Alabama.

STS-47 Crew Insignia
The mission emblem depicts the Space Shuttle Orbiter with the Spacelab module in the payload bay against a backdrop of the flags of the United States and Japan, symbolizing the side-by-side cooperation of the two nations in this mission. The land masses of Japan and Alaska are represented on the emblem as well as the high inclination of the mission's orbit. The initials "SLJ" on the left border stand for Spacelab Japan, and the Japanese characters on the right border form the word "Fuwatto" which means weightlessness.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

I want to congratulate you and your teammates for the excellent work everyone accomplished as we prepared and launched Discovery on the STS-48 mission. During this mission, the Upper Atmosphere Research Satellite (UARS) was successfully deployed. Already, scientists are utilizing data received from the UARS to study man's impact on the planet's fragile protective envelope of life sustaining gases - including the ozone layer in the stratosphere.

I can't think of a body of research more important to mankind and all of us can be justly proud that we made a major contribution to this vital program.

As usual, some problems cropped up as we processed Discovery for launch. However, in each instance, we tackled these problems professionally and efficiently and proceeded to a smooth countdown and launch.

Many thanks to every member of the SPC team for a job well done.

Sincerely,

Gerry Opplige
SPC Program Manager

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-48

NASA
National Aeronautics and
Space Administration

Crew of Space Shuttle Mission STS-48

The STS-48 crew members: Front Row, left to right: Mark Brown (Mission Specialist); John Creighton (Mission Commander); Ken Reightler (Pilot). Back Row, left to right: Sam Gemar (Mission Specialist); Jim Buchli (Mission Specialist).

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

A Tribute to Our Great Endeavour

Dear Team member,

Every person who works on the Shuttle Processing Team can take a great deal of pride in the upcoming first voyage of the orbiter Endeavour. This is truly an historic event!

Endeavour arrived here at Kennedy Space Center on May 7, 1991 and, during the past year our SPC team has checked this orbiter out from stem to stern to insure its launch readiness and flight worthiness.

While Endeavour was in the Orbiter Processing Facility, we installed three new upgraded main engines (and later replaced them out at the pad following the Flight Readiness Firing) and also the Forward Reaction Control System and two Orbital Maneuvering System (OMS) pods.

In addition, our team installed several major components including the liquid hydrogen 17-inch disconnect, the ammonia boiler, the flash evaporator and the external tank door drive mechanisms.

So, in a very real sense, when Endeavour lifts off for its maiden flight in early May, it will be "our bird".

Endeavour is our most advanced orbiter and I'm sure it will perform in an outstanding manner for Capt. Brandenstein and his STS-49 crew.

You have my appreciation for our team's outstanding performance in getting Endeavour ready for launch.

Sincerely,

Gerry Oppliger
SPC Program Manager

National Aeronautics and
Space Administration

Washington, D.C.
20546

Office of the Administrator

APR 20 1992

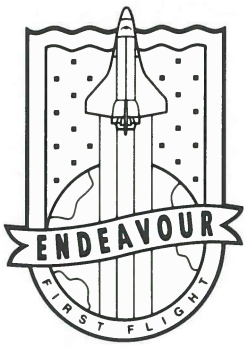
THE TRADITION CONTINUES--ENDEAVOUR'S MAIDEN VOYAGE

America's newest Space Shuttle, Endeavour, will embark on its maiden voyage in early May. During this mission, the STS-49 crew will capture, repair, and deploy the International Telecommunications Satellite and conduct test and evaluation of Space Station Freedom assembly techniques. Endeavour--the fourth orbiter space vehicle in the active fleet--will demonstrate the effectiveness of hardware system upgrades designed to enhance performance and improve weight characteristics.

I am pleased to join the Manned Flight Awareness Program in commemorating this momentous occasion and in paying tribute to the men and women of our government/industry team for their dedication and hard work.

As NASA's new Administrator, I look forward to working with each and every one of you. Together, we will build on the past and move forward to meet the growing challenges of the future, sharing pride in our accomplishments, and turning the dreams of today into the realities of tomorrow.

Daniel S. Goldin
Administrator



ENDEAVOUR STS-49 MISSION SUMMARY

OBJECTIVES: STS-49 is the initial flight test of orbiter Endeavour. This flight will feature the first deployment of a drag chute after landing to assist in slowing the orbiter during rollout. The primary mission objective is to rendezvous, capture, repair and deploy the stranded International Telecommunications Satellite (INTELSAT VI). Secondary mission objectives are to conduct test and evaluation of Space Station Freedom assembly techniques during two person Extravehicular activities (EVA) on three consecutive days.

FACTS: The fourth orbiter space vehicle in the active fleet is outfitted with several systems containing newly designed hardware to enhance performance and improve weight characteristics. Some of these include:

- New avionics for improved guidance and navigation
  - TACAN (Tactical Air Navigation)
  - Improved Radar Altimeter
  - Solid State Startracker
- Improved Nose Wheel Steering
- Improved Auxiliary Power Unit
- Improved Tire Pressure Monitoring System
- Drag Chute Deceleration System

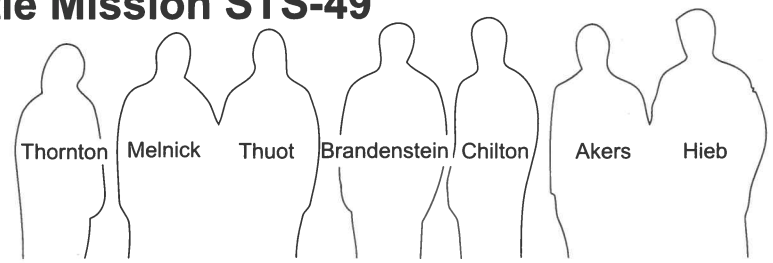
These vehicle improvements, and many others, demonstrate NASA's commitment to continuously upgrade the orbiter systems, ensuring that the only reusable manned space vehicle remains the world standard for safety and reliability.

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-49

National Aeronautics and Space Administration

The Crew of Space Shuttle Mission STS-49



Commander
Daniel C. Brandenstein (Capt., USN)

Dan Brandenstein was born in Watertown, Wisconsin. He earned a bachelor of science degree in mathematics and physics from the University of Wisconsin, River Falls. After graduation, he became an aviator in the U.S. Navy, flying 192 combat missions in the Vietnam War. Brandenstein later tested weapons systems and tactics aboard the A-6 aircraft. Following graduation from the U.S. Naval Test Pilot School, he conducted tests of electronic warfare systems in various Navy aircraft. Brandenstein has logged 6,300 hours flying time and made 400 carrier landings. He became an astronaut in 1978 and has previously flown as a pilot on the STS-8 mission and as the commander on the STS-51G and STS-32 missions. He has been Chief of the Astronaut Office since 1987.

Pilot
Kevin P. Chilton (Lt. Col., USAF)

Kevin Chilton was born in Los Angeles, California. He earned a bachelor of science degree in engineering sciences from the USAF Academy and a master of science degree in mechanical engineering from Columbia University. After graduating from Air Force pilot training, he served as a combat-ready pilot and instructor in the RF-4 Phantom II and the F-15 Eagle. Following graduation from the USAF Test Pilot school, he conducted weapons and systems tests in all models of the F-15 and F-4. He has logged over 3,000 hours of flight time in more than 20 different types of aircraft. Chilton became an astronaut in 1988. This is his first space flight.

Mission Specialist
Richard J. Hieb

Richard Hieb was born in Jamestown, North Dakota. He received a bachelor of arts degree in mathematics and physics from Northwest Nazarene College and a master of science degree in aerospace engineering from the University of Colorado. Following graduation, he joined NASA and worked in many different areas of flight operations, including crew development and spacecraft rendezvous procedures. Hieb became an astronaut in 1986, and flew on the STS-39 mission as a mission specialist.

Mission Specialist
Bruce E. Melnick (Commander, USCG)

Bruce Melnick was born in New York, New York, but considers Clearwater, Florida, to be his hometown. He earned a bachelor of science degree in engineering from the U.S. Coast Guard Academy and a master of science degree in aeronautical systems from the University of West Florida. He served seven years as a Coast Guard rescue pilot and later conducted many of the tests on the Coast Guard's HH-65A "Dolphin" helicopter. He has logged over 4,900 flying hours, mostly in the H-34, H-52, H-65 and T-38 aircraft. Melnick became an astronaut in 1988 and was a mission specialist on Mission STS-41.

Mission Specialist
Pierre J. Thuot (Commander, USN)

Pierre Thuot was born in Groton, Connecticut, but considers Fairfax, Virginia, and New Bedford, Massachusetts, to be his hometowns. He received a bachelor of science degree in physics from the U.S. Naval Academy and a master of science degree in systems management from the University of Southern California. He flew the F-14 Tomcat and made deployments to the Mediterranean and Caribbean Seas while serving aboard the carriers USS John F. Kennedy and USS Independence. He has also worked as a project test flight officer at the Naval Air Test Center, flying the F-14A Tomcat, A-6E Intruder, and the F-4J Phantom II. Thuot has recorded over 2,700 flight hours and made more than 270 carrier landings. He became an astronaut in 1986 and flew as a mission specialist aboard Mission STS-36.

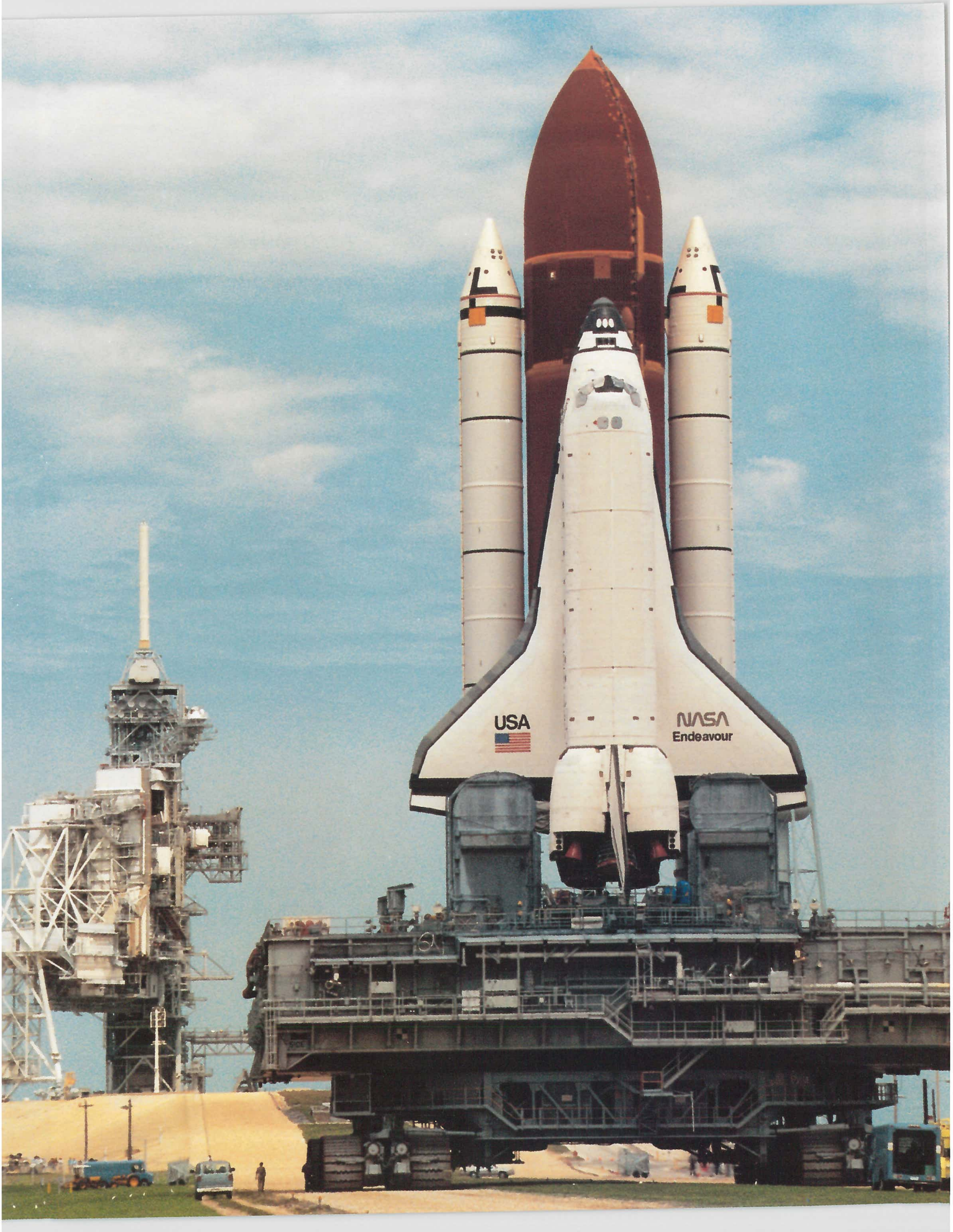
Mission Specialist
Kathryn C. Thornton (Ph.D.)

Kathryn Thornton was born in Montgomery, Alabama. She earned a bachelor of science degree in physics from Auburn University and master of science and doctorate of philosophy degrees in physics from the University of Virginia. She was awarded a NATO Postdoctoral Fellowship at the Max Planck Institute for Nuclear Physics in Heidelberg, Germany, and later worked as a physicist at the U.S. Army Foreign Science and Technology Center. Thornton, who became an astronaut in 1985, was a mission specialist aboard Mission STS-33.

Mission Specialist
Thomas D. Akers (Lt. Col., USAF)

Tom Akers was born in St. Louis, Missouri, but was raised and educated in his hometown of Eminence, Missouri, at Rolla. He received bachelor and master of science degrees in applied mathematics from the University of Missouri. He worked four years as the high school principal in Eminence before joining the Air Force. As a flight test engineer, he worked on several weapons development programs while flying F-4 and T-38 aircraft. Tom was named an astronaut in 1988 and served as a mission specialist aboard STS-41.

STS-49 Crew Insignia
The crew insignia captures space flight's spirit of exploration which has its origins in the early seagoing exploration vessels. The ship depicted is the *Endeavour* that Captain James Cook commanded on his first scientific expedition to the South Pacific. The mast flags bear the colors of the two schools that won a nationwide contest when Endeavour was chosen as the name of NASA's newest Space Shuttle: Senatobia Middle School, Senatobia, Mississippi, and Tallulah Falls School, Tallulah Falls, Georgia.


USA
NASA
Endeavour

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

I'd like to extend my sincere congratulations to you and your SPC teammates for another very noteworthy achievement. The STS-50 astronaut crew has just set a record for the longest Shuttle flight ever as they remained in space for nearly two weeks. This record was made possible by your great work in getting Columbia - our oldest orbiter - ready for this most challenging mission.

Columbia had to have many upgrades to prepare it for extended flight including an increased vehicle power and waste capacity, a new regenerating system to remove carbon dioxide from the crew cabin atmosphere and two additional nitrogen tanks. Of course, all these new systems had to be thoroughly checked out.

In addition, we installed the Extended Duration Orbiter pallet in the aft of Columbia's cargo bay which provided extra electrical power and drinking water during this record setting flight.

Not only was the record set for extended Shuttle flight but we gained extremely important advanced microgravity research from the Microgravity Laboratory-1 (USML-1).

You and your colleagues performed your work in an outstanding manner and Columbia was very well prepared for this important mission.

I commend you all for a job well done!

Sincerely,

Gerry Oppliger

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Team Member,

Thanks and congratulations to all for the great job of preparing Discovery for the STS-51 mission.

From all reports the Shuttle performed almost flawlessly enabling Capt. Culbertson and his crew to accomplish a wide range of operations - including a six hour space walk.

The astronauts deployed an Advanced Communications Technology Satellite (ACTS) as well as an Orbiting and Retrievable Far and Extreme Ultraviolet Spectrograph (now that's a mouthful!).

Of particular interest to many of us on the SPC team was the IMAX 70 mm camera activity which shot footage for the new Lockheed sponsored film, which is the third of a series of movies we have backed.

Thanks again for the good work and your continuing focus on safety, quality and adherence to procedures.

Sincerely,

Gerry T. Oppliger
President

Special Report To Employees

October 1, 1993

Dear Team Member,

On October 1, the Shuttle Processing Contract Team commemorates and celebrates its tenth year as NASA's Shuttle processing organization. Without a doubt, the period 1983 to 1993 has been "a great ten years"!

It has been a great period for our team, for NASA, for our nation's space program and for mankind's continuing quest of space exploration.

This decade of excellence was made possible, in large measure, by the expertise, professionalism, dedication and plain hard work demonstrated by you and your colleagues on the SPC team.

We have continually improved our performance of the vital Shuttle processing mission through streamlined procedures, technology advances, enhanced training and personnel development and excellent management.

The sustained high evaluations NASA has awarded our team, as well as literally hundreds of prestigious individual and team awards we have earned, attest to the overall excellence of our performance.

We have persevered through good times and bad, through triumph and tragedy, to create a record of which we can all be proud.

We now confidently gear up to head into our second decade of service to NASA and the nation with a firm determination to perform our mission in the safest and most efficient and effective manner possible.

We are very pleased and proud to salute you all at this significant milestone.

Gerry Oppliger
SPC Program Manager
Lockheed Space Operations Company

Skip Olson
Director
Integrated Ground Operations
Grumman Technical Services

Dale Nash
Director of VAB Operations
Thiokol Corporation

Lee Kapit
Director, Operations Analysis
Johnson Controls World Services Inc.

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-51

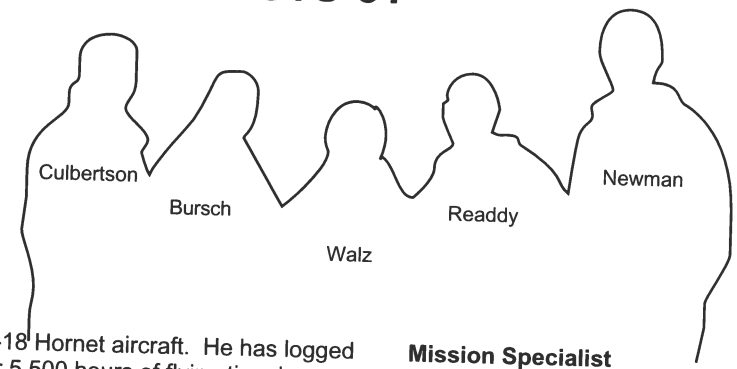
National Aeronautics and Space Administration

JSCCL-131

The Crew of Space Shuttle Mission STS-51

Commander
Frank L. Culbertson, Jr. (Capt., USN)
Frank Culbertson was born in Charleston, South Carolina, but considers Holly Hill, South Carolina, his hometown. He earned a bachelor of science degree in aerospace engineering from the U.S. Naval Academy. Culbertson served in the Gulf of Tonkin aboard the USS *Fox* during the Vietnam War before being designated a naval aviator. After training as an F-4 Phantom pilot, he served aboard the USS *Midway* out of Yokosuka, Japan. After assignments with the USAF and aboard the USS *John F. Kennedy*, he graduated with distinction from the U.S. Naval Test Pilot School. He was program manager for all F-4 testing and a test pilot for automatic carrier landing systems in the Carrier Systems Branch at the Naval Air Test Center. He was training in the F-14A Tomcat until his selection as an astronaut candidate in 1984. He has logged over 4,400 flying hours in over 40 different types of aircraft and has made over 450 carrier landings. Culbertson served as pilot on STS-38 and was most recently Deputy Chief of the Station-Exploration Support Office.

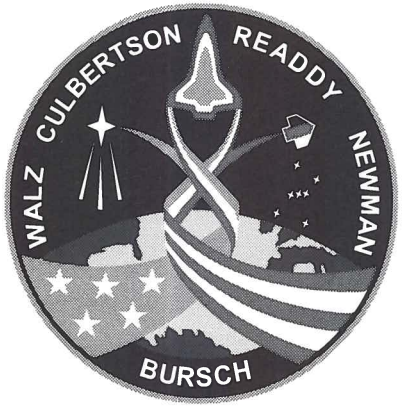
Pilot
William F. Readdy (Cdr., USNR)
William Readdy was born in Quonset Point, Rhode Island. He earned a bachelor of science degree in aeronautical engineering in 1974 from the U.S. Naval Academy. Following designation as a naval aviator and training in the A-6 Intruder, he served aboard the USS *Forrestal* in the North Atlantic and Mediterranean. After working as a test pilot at Patuxent River, Maryland, he served as a strike operations officer on the USS *Coral Sea*, flying A-6 and F/A-18 Hornet aircraft. He has logged over 5,500 hours of flying time in more than 60 types of fixed wing aircraft and helicopters, and made over 550 carrier landings. Selected as an astronaut candidate in 1987, Readdy flew on STS-42 aboard *Discovery*, logging 193 hours in space.



Mission Specialist
Daniel W. Bursch (Cdr., USN)
Daniel Bursch was born in Bristol, Pennsylvania, but considers Vestal, New York, his hometown. He earned a bachelor of science degree in physics from the U.S. Naval Academy, and a master of science degree in engineering science from the Naval Postgraduate School. After training as an A-6E Intruder bombardier/navigator, he served aboard the USS *John F. Kennedy* and USS *America*. After working as a project test flight officer for the A-6 Intruder, he served as a flight instructor at the U.S. Naval Test Pilot School. Bursch worked as Strike Operations Officer for Commander, Cruise-Destroyer Group 1, making deployments to the Indian Ocean aboard the USS *Long Beach* and USS *Midway*. He has over 1,800 flight hours in more than 35 different aircraft. Bursch became an astronaut in 1991. This is his first space flight.

Mission Specialist
James H. Newman (Ph.D.)
James Newman was born in the Trust Territory of the Pacific Islands, but calls San Diego, California, his home. He received a bachelor of arts degree in physics from Dartmouth College, and a master of arts degree and a doctoral degree in physics from Rice University. He was appointed an adjunct professor in the Department of Space Physics and Astronomy at Rice University, with research interests in atomic and molecular physics. While working at NASA Johnson Space Center, his responsibilities have included conducting flight crew and flight control team training for all Shuttle mission phases in the areas of orbital propulsion, guidance and control. Newman became an astronaut in 1991. This is his first space flight.

Mission Specialist
Carl E. Walz (Major, USAF)
Carl Walz was born in Cleveland, Ohio. He received a bachelor of science degree in physics from Kent State University, and a master of science degree in solid state physics from John Carroll University. While stationed at McClellan Air Force Base in California, he worked as a radiochemical project officer, responsible for analysis of radioactive samples from the Atomic Energy Detection System. As a flight test engineer at the F-16 Combined Test Force, Edwards Air Force Base, he worked on F-16C avionics and armament development programs, flying F-4 and F-16 aircraft. He also served as a flight test program manager at Detachment 3, Air Force Flight Test Center. Walz became an astronaut in 1991. This is his first space flight.



STS-51 Crew Insignia

The STS-51 crew patch honors all who have contributed to mission success and symbolizes NASA's continuing quest to increase mankind's knowledge and use of space through this multifaceted mission. The gold star represents the U.S. Advanced Communications Technology Satellite (ACTS) boosted by the Transfer Orbit Stage (TOS). The rays below the ACTS/TOS represent the innovative communication technologies to be tested by this experiment. The stylized Shuttle Pallet Satellite (SPAS) represents the German-sponsored ASTRO/SPAS mission. The constellation Orion below the SPAS is representative of the types of stellar objects to be studied by its experimenters. The stars in Orion also commemorate the astronauts who have sacrificed their lives for the space program. The ascending spiral, symbolizing America's continuing commitment to leadership in space exploration and development, originates with the thousands of people who ensure the success of each Shuttle mission. The five large white stars, representing the five crew members, and the one gold star symbolize the mission number.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

I'd like to extend my personal congratulations to you and your teammates for the outstanding job of preparing Columbia for the STS-52 mission and the excellent landing and recovery operations here at Kennedy Space Center.

This was the 41st Shuttle processed and launched by our SPC Team out of a total of 51 Shuttle launches.

Deploying the Laser Geodynamic Satellite II (LAGEOS II) and conducting numerous experiments kept Commander Jim Wetherbee and his hard-working crew extremely busy throughout this ten day mission but the payoff was worth the effort as they achieved outstanding results.

Again, my thanks to you and your colleagues for a job well done!

Sincerely,

Gerry Oppliger
President

NASA National Aeronautics and Space Administration

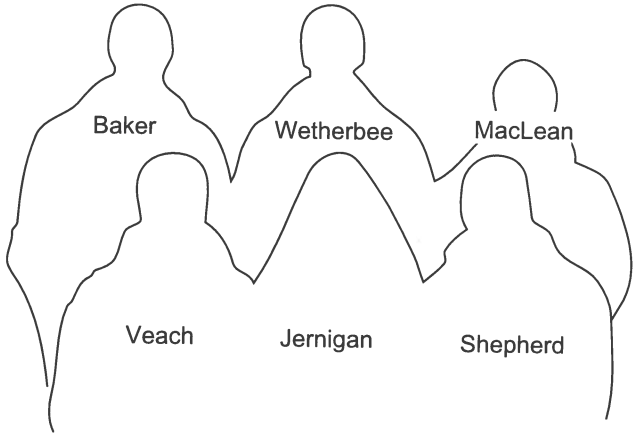
Crew of Space Shuttle Mission STS-52

National Aeronautics and
Space Administration

JSCCL-125

The Crew of Space Shuttle Mission STS-52

Commander
James D. Wetherbee (Cmdr., USN)
James Wetherbee was born in Flushing, New York. He earned a bachelor of science degree in aerospace engineering from the University of Notre Dame. After being designated a Naval Aviator, he served aboard the USS John F. Kennedy, where he performed 125 night carrier landings in the A-7E aircraft. While at the Systems Engineering Test Directorate, Wetherbee was a project officer and test pilot for the weapons delivery system and avionics integration of the F/A-18 aircraft. He has logged over 3,500 hours flying time in 20 different types of aircraft. Wetherbee became an astronaut in 1985. He served as pilot on the crew of STS-32.



Pilot
Michael A. Baker (Capt., USN)
Michael Baker was born in Memphis, Tennessee, but considers Lemoore, California, to be his hometown. He received a bachelor of science degree in aerospace engineering from the University of Texas. After completing flight training, he flew the A-7E aircraft aboard the USS Midway. He conducted A-7 aircraft-related tests on the various aircraft carriers in the Navy's fleet. Baker served as an instructor at the U.S. Naval Test Pilot School before assignment as the U.S. Navy Exchange Instructor at the Empire Test Pilots' School in Boscombe Down, England. He has logged over 3,600 hours flying time in some 50 different types of aircraft and has completed over 300 carrier landings. He was named an astronaut in 1985, and was pilot of the STS-43 mission.

Mission Specialist
William Shepherd (Capt., USN)
William Shepherd was born in Oak Ridge, Tennessee, but considers Babylon, New York, his hometown. He earned a bachelor of science degree in aerospace engineering from the U.S. Naval Academy, and the degrees of ocean engineer and master of science in mechanical engineering from the Massachusetts Institute of Technology. He served with the U.S. Navy's Underwater Demolition Team Eleven, SEAL Teams One and Two, and Special Boat Unit Twenty before his selection as an astronaut in 1985. Shepherd has flown two Shuttle missions: as a mission specialist on STS-27 and STS-41.

Mission Specialist
Tamara E. Jernigan (Ph.D.)
Tamara Jernigan was born in Chattanooga, Tennessee. She received a bachelor of science degree in physics (with honors), a master of science degree in engineering science from Stanford University, a master of science degree in astronomy from the University of California-Berkeley, and a doctorate in space physics and astronomy from Rice University. She worked in the Theoretical Studies Branch at NASA's Ames Research Center, conducting studies of bipolar outflows in the regions of star formation, gamma ray bursters, and shock wave phenomena in the interstellar system. Dr. Jernigan was named an astronaut in 1985. Her assignments have included software verification in the Shuttle Avionics Integration Laboratory and coordinating operations on secondary payloads. She also served as lead astronaut for flight software development. Dr. Jernigan flew as a mission specialist aboard STS-40.

Mission Specialist
Charles Lacy Veach (Mr.)
Lacy Veach was born in Chicago, Illinois, but considers Honolulu, Hawaii, to be his hometown. He earned a bachelor of science degree in engineering management from the U.S. Air Force Academy. After receiving his pilot wings, he attended fighter gunnery school at Luke Air Force Base, Arizona. He served as a U.S. Air Force (USAF) fighter pilot, flying the F-100 Super Sabre, the F-111 and the F-105 Thunderchief on various assignments, including a 275-mission combat tour during the Vietnam War. He has also been a member of the USAF Air Demonstration Squadron, the Thunderbirds. Veach left active duty in 1981 but continues to fly F-16s with the Texas Air National Guard. He has logged over 5,000 flying hours. Named an astronaut in 1984, he flew as a mission specialist aboard STS-39.

Payload Specialist
Steven Glenwood MacLean (Ph.D.)
Steven MacLean was born in Ottawa, Ontario. He earned a bachelor of science degree in honors physics and a doctorate degree in physics from York University. He was a member of Canadian National Gymnastics Team 1 and taught part-time at York University. He became a visiting scholar at Stanford University under Nobel Laureate A. L. Shawlow. Dr. MacLean is a laser physicist whose research has included work on electro-optics, laser-induced florescence of particles and crystals, and multiphoton laser spectroscopy. He was one of six Canadian astronauts selected in 1983. He is astronaut adviser to the Strategic Technologies in the Automation & Robotics.

STS-52 Crew Insignia
A gold star is a symbol often associated with the frontier period of the American West. The STS-52 patch features a large gold star to symbolize the crew's mission on the frontiers of space. The red border in the shape of the Greek letter lambda represents both the Lambda Point Experiment and the laser measurements to be taken from the Laser Geodynamic Satellite (LAGEOS II). The remote manipulator and maple leaf are emblematic of the Canadian payload specialist.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Colleagues,

Discovery landed at Edwards Air Force Base on Dec. 9th ending a most successful STS-53 mission. This was indeed a very significant mission as it carried a classified Department of Defense (DoD) primary payload. This was the ninth in a series of DoD payloads the Shuttle has flown and the last scheduled dedicated DoD mission.

We can all be proud of our truly significant contributions to national defense through the successful deployment of these classified payloads.

STS-53 also marked the end of our calendar year 1992 launches. Eight were scheduled and eight were launched!

This achievement was made possible, in large measure, by the outstanding performance turned in by you and your fellow team members. It is most gratifying that NASA recognized this high level of performance by awarding us the highest award fee rankings in SPC history.

This has truly been a year of remarkable achievement by our SPC team and it was "topped off" by last month's great news that LSOC and its teammates had been selected for the Base Operations Contract. The BOC represents a significant challenge to which I'm sure we will be equal.

Finally, let me take this opportunity to wish you and your family a most rewarding, safe and happy holiday season.

Sincerely,

Gerry Oppliger
President

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-53

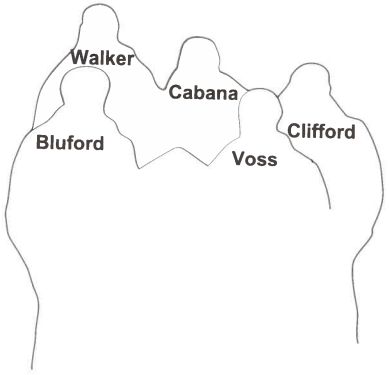
National Aeronautics and Space Administration

JSCCL-127

The Crew of Space Shuttle Mission STS-53

Commander
David M. Walker (Capt., USN)
David Walker was born in Columbus, Georgia, but considers Eustis, Florida, his hometown. He graduated from the U. S. Naval Academy in 1966, and received his Naval Aviator Wings in 1967. After two combat cruises aboard the USS Enterprise and USS America flying F4 Phantoms, Walker attended the USAF Aerospace Research Pilot School at Edwards Air Force Base, California, in 1971. From 1972 through 1975, Walker was assigned to the Naval Air Test Center at Patuxent River, Maryland, as an experimental test pilot, then returned to the fighter community in F14 Tomcats for two Mediterranean cruises prior to selection by NASA to the 1978 astronaut class. He has logged over 6,000 flying hours in more than 40 different types of aircraft. Walker was pilot of STS-51A aboard *Discovery* in November 1984 and was commander of STS-30 on *Atlantis* in May 1989.

Pilot
Robert D. Cabana (Col., USMC)
Robert Cabana was born and raised in Minneapolis, Minnesota. He received a bachelor of science degree in mathematics from the U. S. Naval Academy in Annapolis, Maryland. After graduation, he was commissioned in the United States Marine Corps and earned his wings as a Naval flight officer and a Naval aviator flying the A-6 Intruder with the lst and 2nd Marine Aircraft Wings. Following his graduation from U. S. Naval Test Pilot School in Patuxent River, Maryland, he flew numerous



ordnance and flight system test projects in the A-4 and A-6 airplanes and participated in development of the flight control system for the X-29 flight technology demonstrator. He has logged over 4,300 hours flying time. Cabana was selected to be an astronaut in 1985 and flew his first mission as the pilot of Discovery on STS-41 in October 1990.

Mission Specialist
Guion S. Bluford, Jr. (Col., USAF)
Guy Bluford was born and raised in Philadelphia, Pennsylvania. He received a bachelor of science degree in aerospace engineering from Penn State University and master of science and doctorate of philosophy degrees in aerospace engineering from the Air Force Institute of Technology. He also has a master's degree in business administration from the University of Houston. After graduating from Air Force pilot training, he flew 144 combat missions in Vietnam in the F4C Phantom II and then was an instructor pilot in T-38 aircraft. Bluford later served as an aerospace engineer and branch chief in the Air Force Flight Dynamics Laboratory. He has logged over 5,500 flying hours in more than 10 different types of aircraft. He became an astronaut in 1978 and flew as a mission specialist on STS-8, STS-61A, and STS-39.

Mission Specialist
James S. Voss (LTC, USA)
Jim Voss was born in Cardova, Alabama, but considers Opelika, Alabama, to be his hometown. He earned a bachelor of science degree in aerospace engineering from Auburn University and a master of science degree in aerospace engineering sciences from the University of Colorado. After completing airborne and ranger training, Voss served as an infantry platoon leader, intelligence staff officer, and company commander in Germany, then taught in the Department of Mechanics at West Point. He graduated from the U. S. Naval Test Pilot School and served as an Army flight test engineer. At NASA, Voss worked as a vehicle integration test engineer before becoming an astronaut in 1987. He flew as a mission specialist on STS-44 in November 1991.

Mission Specialist
Michael Richard Clifford (LTC, USA)
Rich Clifford was born in San Bernadino, California, but considers Ogden, Utah, to be his hometown. He earned a bachelor of science degree from the United States Military Academy and a master of science degree in aerospace engineering from the Georgia Institute of Technology. Upon graduation from West Point, Clifford served as a platoon leader with the 10th Cavalry. He then completed pilot training as the top graduate of his class. He served in a variety of positions with the 2nd Armored Cavalry Regiment in Germany and was an assistant professor of mechanical engineering at West Point. Clifford became a test pilot following graduation from the U. S. Naval Test Pilot School in 1986. He has flown over 2,700 hours in more than 50 types of fixed and rotary wing aircraft. Clifford was selected as a NASA astronaut in 1990. This will be his first space flight.

STS-53 Crew Insignia

The STS-53 insignia shows the Space Shuttle *Discovery* rising to new achievements trailing the symbol of the Astronaut Office over the American flag. The pentagonal shape represents the Department of Defense and its support of the Space Shuttle Program. The five stars and three stripes of the flag represent the mission number, STS-53, and America's continuing commitment to world leadership in space. The four color bands separating the flag from space represents the military service colors of the crew members.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Team Member,

What a great way to start the new year!

The January 13 launch of Endeavour on STS-54 went very smoothly, their important mission was successful and they landed safely here at Kennedy Space Center on January 19.

As always, the outstanding work you and your colleagues performed as Endeavour was being prepared for this, its third flight, was absolutely crucial to mission success - including the placement in orbit of the fifth Tracking and Data Relay Satellite (TDRS) in a global communications constellation.

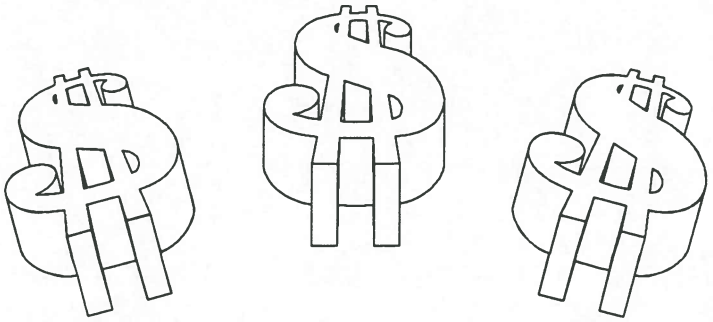
With each launch, our team proves that its excellent reputation for professionalism and responsiveness to NASA requirements is very well deserved.

Also, I would like all of us to rededicate ourselves to the concept of "Safety First" at KSC in 1993 and, in that regard, I am taking this opportunity to announce the 1993 SPC Safety Slogan and Logo Contest. Periodically, we invite SPC team members to develop a slogan and logo for use in safety awareness programs throughout KSC. We had hundreds of entries during the 1992 contest, and competition was keen. I look forward to similar response this year and encourage all to participate. Details are outlined in the enclosed flier.

Thanks for your sustained superb performance!

Sincerely,

Gerry T. Oppliger
President



ANNOUNCING THE 1993 SPC SAFETY SLOGAN AND LOGO CONTEST

OPEN TO ALL SPC TEAM MEMBERS AND DEPENDENTS

EASY TO ENTER...

SUBMIT A SLOGAN OR LOGO YOU THINK BEST EXEMPLIFIES SAFETY PRINCIPALS OBSERVED DURING SPACE SHUTTLE PROCESSING

...CONTEST RULES...

1. ALL ENTRIES MUST BE AN ORIGINAL CONCEPT OR IDEA.
2. ENTRIES MUST BE SUBMITTED SINGLY ON 8.5 X 11 BOND PAPER.
3. INCLUDE THE FOLLOWING ON THE BACK OF EACH ENTRY:
   NAME, DEPARTMENT NUMBER, TELEPHONE NUMBER AND MAIL CODE.
   FOR DEPENDENT ENTRIES, NAME OF SPONSORING EMPLOYEE, AND AGE AND RELATIONSHIP FOR CHILDREN 12 AND YOUNGER
4. SLOGAN ENTRIES MUST BE LIMITED TO 15 WORDS OR LESS
5. LOGO ENTRIES MUST BE LIMITED TO THREE COLORS

SUBMIT ENTRIES TO: SLOGAN & LOGO CONTEST, LSO-296
ENTRIES WILL BE ACCEPTED THROUGH MARCH 12, 1993

JUDGING WILL BE PERFORMED BY A VOLUNTEER COMMITTEE

PRIZES WILL BE AWARDED AS FOLLOWS:

FIRST PLACE SLOGAN AND LOGO:	$500 SAVINGS BOND EACH
SECOND PLACE SLOGAN AND LOGO	$200 SAVINGS BOND EACH
THIRD PLACE SLOGAN AND LOGO:	$100 SAVINGS BOND EACH

FIRST PLACE IN BOTH CATEGORIES FROM A YOUTH ENTRANT (12 YEARS OR YOUNGER) WILL RECEIVE A $100 SAVINGS BOND

SPONSORED BY SPC OCCUPATIONAL SAFETY AND HEALTH 861-6288

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-54

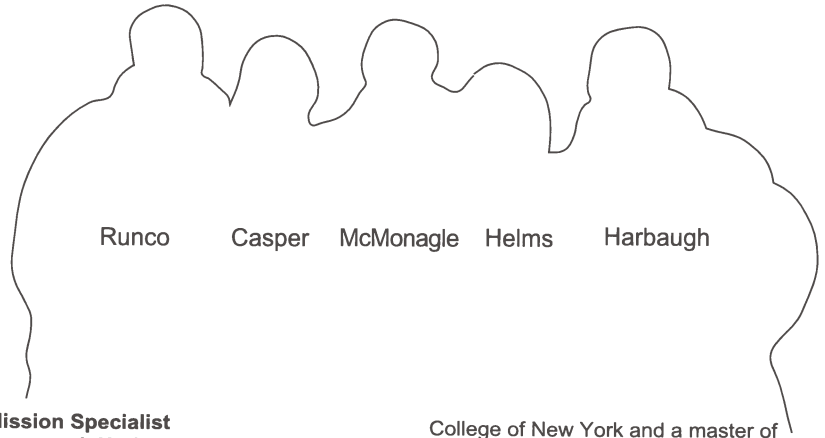
National Aeronautics and Space Administration

JSCCL-126

The Crew of Space Shuttle Mission STS-54

Commander
John H. Casper (Col., USAF)
John Casper was born in Greenville, South Carolina, but calls Gainesville, Georgia, home. He earned a bachelor of science degree in engineering science from the U.S. Air Force Academy and a master of science degree in astronautics from Purdue University. He is also a graduate of the Air Force Air War College. His operational fighter experience was in the F-100 and F-4 aircraft, including 229 combat missions during the Vietnam War. While serving as a test pilot at Edwards Air Force Base, California, Casper commanded the 6513th Test Squadron and conducted weapons delivery, avionics testing, and flying quality evaluations in various tactical fighter aircraft, including the F-4 and A-7. He was assigned to USAF Headquarters at the Pentagon, serving first as an action officer for the Deputy Chief of Staff, Plans and Operations, and later as deputy chief of the Special Projects Office. Casper has logged over 6,000 flying hours in 50 different aircraft. He was named an astronaut in 1984. He flew as pilot aboard STS-36.

Pilot
Donald R. McMonagle (Lt. Col., USAF)
Donald McMonagle was born in Flint, Michigan. He earned a bachelor of science degree in astronautical engineering from the U.S. Air Force Academy and a master of science degree in mechanical engineering from California State University-Fresno. He served as an F-4 pilot at Kunsan Air Base, South Korea, before assignment to Holloman Air Force Base, New Mexico, where he flew F-15s. He was the operations officer and a project test pilot for a technology demonstration aircraft, the F-16, while stationed at Edwards Air Force Base, California. McMonagle has over 4,200 hours of flying time in several aircraft, primarily the T-38, F-4, F-15, and F-16. He was named an astronaut in 1987, and flew as a mission specialist aboard STS-39.



Mission Specialist
Gregory J. Harbaugh (Mr.)
Gregory Harbaugh was born in Cleveland, Ohio, but Willoughby, Ohio, is his hometown. He received a bachelor of science degree in aeronautical and astronautical engineering from Purdue University and a master of science degree in physical science from the University of Houston, Clear Lake. He has held engineering and technical management positions in various areas of Space Shuttle flight operations at NASA's Johnson Space Center. He supported Shuttle operations from Mission Control for most flights from STS-1 through STS-51L. He also holds a commercial pilot's license and has logged over 1,000 hours flying time. Harbaugh was named an astronaut in 1987, and worked as Remote Manipulator System (RMS) and robotics lead. He also worked extensively on the Hubble Space Telescope servicing mission development. Harbaugh flew as a mission specialist aboard STS-39.

Mission Specialist
Mario Runco, Jr. (Lt. Cdr., USN)
Mario Runco, Jr., was born in the Bronx, New York, but considers Yonkers, New York, to be his hometown. He earned a bachelor of science degree in meteorology and physical oceanography from the City College of New York and a master of science degree in meteorology from Rutgers University. Upon graduation from Rutgers, Runco worked as a research hydrologist for the U.S. Geological Survey. He then joined the New Jersey State Police and worked as a New Jersey State Trooper until he entered the U.S. Navy. In the Navy, Runco was first assigned as a research meteorologist and then served aboard USS Nassau (LHA-4) where he earned the designation of Surface Warfare Officer. He later taught the Geophysics Technical Readiness Laboratory course at the Naval Postgraduate School. As commanding officer of Oceanographic Unit Four embarked in USNS Chauvenet (T-AGS-29), he led hydrographic and oceanographic surveysof the Java Sea and Indian Ocean. Runco was selected as a NASA astronaut in 1987. Runco was a mission specialist on STS-44.

Mission Specialist
Susan J. Helms (Major, USAF)
Susan Helms was born in Charlotte, North Carolina, but calls Portland, Oregon, her hometown. She earned a bachelor of science degree in aeronautical engineering from the U.S. Air Force Academy and a master of science degree in aeronautics/ astronautics from Stanford University. While at Eglin Air Force Base, Florida, she was an F-16 weapons separation engineer and later lead engineer for F-15 weapons separation. She subsequently was assigned to the faculty of the USAF Academy where she held the position of assistant professor. Helms served as a USAF exchange officer to the Aerospace Engineering Test Establishment, CFB Cold Lake, Alberta, Canada, working as a flight test engineer and project officer on CF-18 aircraft. She has flown in 30 different types of U.S. and Canadian aircraft. Helms was named an astronaut in 1990.

STS-54 Crew Insignia

The crew insignia depicts the American bald eagle soaring above the Earth and is emblematic of the Space Shuttle *Endeavour* in service to the United States and the world. The eagle is clutching an eight-pointed star in its talons and is placing this larger star among a constellation of four others, representing the placement of the fifth Tracking and Data Relay Satellite into orbit among the four already in service. The blackness of space --with stars conspicuously absent-- represents our other primary mission in carrying the Diffuse X-ray Spectrometer to orbit to conduct astronomical observations of invisible x-ray sources within the Milky Way Galaxy. The depiction of Earth showing our home continent of North America is an expression of the crew's and NASA's intention that the medical and scientific experiments conducted on board be for the benefit of mankind. The clouds and blue of the Earth represent the crew's part in NASA's Mission to Planet Earth in conducting Earth observation photography.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Team Member,

Congratulations and thanks to you and your teammates for the outstanding preparation of Columbia for its STS-55 mission.

This was our second Spacelab flight under German mission management and, as such, we built on the knowledge we gained on the first flight in 1985. More than 90 experiments were conducted and a tremendous amount of valuable data was generated.

Again, my thanks to you and the entire team for sustained outstanding performance and the progress made in finding ways to process the Shuttle more safely and efficiently.

Sincerely,

Gerry T. Oppliger
President

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-55

National Aeronautics and Space Administration

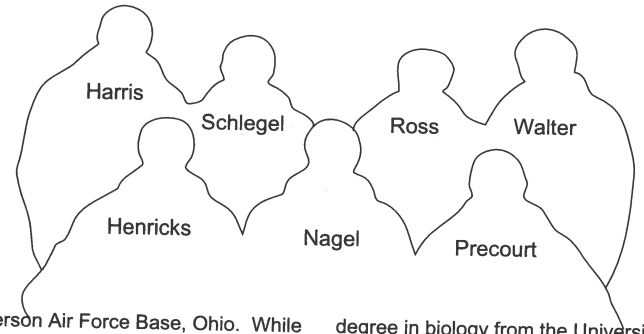
JSCCL-128

The Crew of Space Shuttle Mission STS-55

Commander
Steven R. Nagel (Col., USAF)
Steven Nagel was born in Canton, Illinois. He received a bachelor of science degree in aeronautical and astronautical engineering from the University of Illinois and a master of science degree in mechanical engineering from California State University, Fresno. Nagel was an F-100 pilot with the 68th Tactical Fighter Squadron at England Air Force Base, Louisiana. During the Vietnam War, he served as a T-28 instructor for the Laotian Air Force at Udorn, Thailand, before returning to the U.S. to become an A-7D instructor pilot and flight examiner at England Air Force Base. He was later assigned to the 6512th Test Squadron at Edwards Air Force Base, California. Nagel has logged 7,000 hours flying time. He became an astronaut in 1979 and has flown in space three times: as a mission specialist aboard STS-51G, a pilot on STS-61A, and commander of STS-37.

Pilot
Terence T. "Tom" Henricks (Col., USAF)
Tom Henricks was born in Bryan, Ohio, but considers Woodville, Ohio, to be his hometown. He received a bachelor of science degree in civil engineering from the U.S. Air Force Academy in 1974 and a master's degree in public administration from Golden Gate University in 1982. Upon graduation from the Air Force Academy, Henricks completed pilot training and flew F-4 fighter aircraft in England, Iceland, and the U.S. He is a graduate of the Air Force's Fighter Weapons and Test Pilot Schools. He was an F-16C test pilot prior to his selection as a NASA astronaut. He has logged 747 parachute jumps and over 4,000 hours flying time in jet aircraft and has flown once in space as pilot aboard STS-44.

Mission Specialist
Jerry L. Ross (Col., USAF)
Jerry Ross was born in Crown Point, Indiana. He earned bachelor of science and master of science degrees in mechanical engineering from Purdue University. After accepting a commission with the Air Force, he was assigned to the Ramjet Engine Division of the Air Force Aero-Propulsion Laboratory at Wright-Patterson Air Force Base, Ohio. While there, he conducted computer-aided design studies on ramjet and mixed cycle propulsion systems. During his tour of duty at Edwards Air Force Base as chief B-1 flight test engineer, Ross was responsible for training and supervising all Air Force B-1 flight test engineer crew members. He has logged nearly 2,100 flying hours in 21 different types of aircraft, and also holds a private pilot's license. Selected as an astronaut in 1980, Ross was a mission specialist on STS-61B, STS-27, and STS-37.



Mission Specialist
Charles J. Precourt (Lt. Col., USAF)
Charles Precourt was born in Waltham, Massachusetts, but considers Hudson, Massachusetts, his hometown. He received a bachelor of science degree in aeronautical engineering from the U.S. Air Force Academy, a master of science degree in engineering management from Golden Gate University, and a master of arts degree in national security affairs and strategic studies from the U.S. Naval War College. He also studied as an exchange student at the French Air Force Academy. Precourt flew the F-15 while based at Bitburg Air Base in Germany. As a test pilot at Edwards Air Force Base, California, Precourt flew the F-15E, F-4, A-7 and A-37 aircraft. His flight experience includes more than 4,500 hours in over 40 types of civil and military aircraft. Precourt was selected as an astronaut in 1990.

Mission Specialist
Bernard A. Harris, Jr. (M.D.)
Bernard Harris, Jr., was born in Temple, Texas. He earned a bachelor of science degree in biology from the University of Houston and doctorate in medicine from Texas Tech University School of Medicine. After completing his residency training in internal medicine at the Mayo Clinic, he worked at the NASA Ames Research Center in the field of musculoskeletal physiology and disuse osteoporosis. He then joined NASA Johnson Space Center as a clinical scientist and flight surgeon, conducting clinical research of space adaptation and how to counter the effects of extended space flight. Harris is the author and co-author of numerous scientific publications, and also a licensed private pilot. He was named an astronaut in 1990.

Payload Specialist
Ulrich Walter (German Astronaut)
Walter was born in Iserlohn, Germany. He received a diploma in solid state physics from the University of Cologne after having served as an instructor and lieutenant at the Army Air Defense School. After studying neutron scattering in magnetic systems, he graduated and became a member of the academic staff. He held postdoctoral positions at the Argonne National Laboratory, Chicago, and the University of California at Berkeley, before being nominated as a German astronaut in 1987. Along with his training as a science astronaut at the DLR, Germany, he headed a team at the University of Darmstadt, Germany, studying high-temperature superconductors and highly correlated electron systems by scanning tunneling microscopy. Walter has authored 35 publications in various international scientific journals, is a certified diver, and holds a private pilot's license. This will be his first space flight.

Payload Specialist
Hans W. Schlegel (German Astronaut)
Hans Wilhelm Schlegel was born in Überlingen, Germany. Schlegel has served as a paratrooper in the Federal Armed Forces of Germany. He earned a Diploma in Physics at the University of Aachen, Germany. He became a member of the academic staff at Rheinisch Westfälisch Technische Hochschule Aachen as an experimental solid state physicist. While there, he conducted research in the field of electronic transport properties and optical properties of semiconductors. Schlegel then became a specialist in non-destructive material testing methodology in the research and development department of the Institut Dr. Förster GmbH & Co. KG in Reutlingen, Germany. He received his basic astronaut training at the German Aerospace Research Establishment. Schlegel is a certified diver and holds a private pilot's license including instrument rating and aerobatics. This will be his first space flight.

STS-55 Crew Insignia

The design for Shuttle Mission STS-55 displays the Orbiter with the Spacelab module over an Earth-sky background. This mission is the second dedicated German Spacelab flight and has accordingly been designated D-2 (the D is for Deutsche). Depicted beneath the Orbiter are the American and German flags flying together, representing the partnership of this laboratory mission. The two blue stars in the border with the crew members' names signify each of the backup payload specialists, Gerhard Thiele and Renate Brummer. The stars in the sky stand for each of the children of the crew members in symbolic representation of the space program's legacy to future generations. The rainbow symbolizes the hope for a brighter tomorrow because of the knowledge and technologies gained from this mission's multi-faceted experiments.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

Orbiter Discovery and its STS-56 crew touched down at the Kennedy Space Center Shuttle Landing Facility on April 16th concluding a very successful mission.

All team members who contributed to the preparation of the Shuttle for this mission are to be commended for their performance.

Commander Cameron and his crew conducted the Atlas-2 research and generated valuable data on the sun's energy output and the chemical composition of the middle atmosphere. Many other valuable experiments were also completed.

Again, my thanks and congratulations to all for a job well done.

Sincerely,

Gerry Oppliger
President

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-56

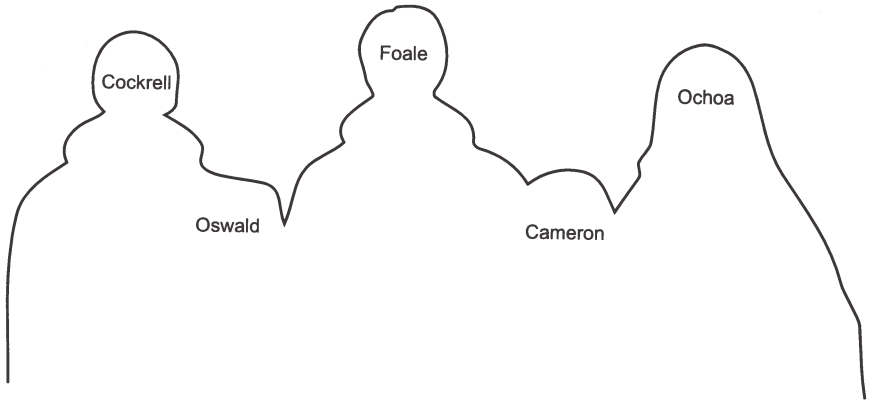
National Aeronautics and Space Administration

JSCCL-129

The Crew of Space Shuttle Mission STS-56

Commander
Kenneth D. Cameron (Col., USMC)
Kenneth Cameron was born in Cleveland, Ohio. He earned bachelor of science and master of science degrees in aeronautics and astronautics from the Massachusetts Institute of Technology. He served in the Vietnam War as a Platoon Commander with the 1st Battalion, 5th Marine Regiment and later with the Marine Security Guards at the U.S. Embassy, Saigon. Following his return to the U.S., he was assigned to the Marine Corps Air Station, Yuma, Arizona, where he flew A-4M Skyhawks. He flew with the Marine Aircraft Group 12 in Iwakuni, Japan, and attended the U.S. Naval Test Pilot School, Patuxent River, Maryland. Following graduation, he served as project officer and test pilot in the F/A-18, A-4 and OV-10 aircraft. Cameron has logged over 3,400 flying hours in 46 different types of aircraft. He became an astronaut in 1985 and was the pilot on STS-37.

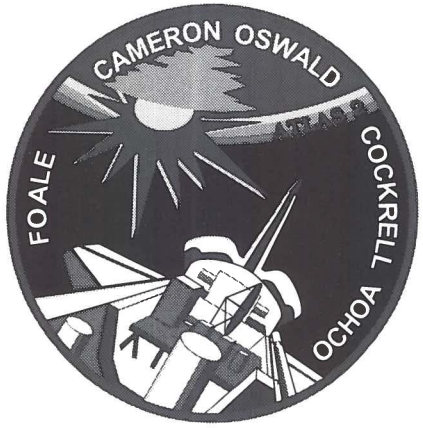
Pilot
Stephen S. Oswald (Mr.)
Stephen Oswald was born in Seattle, Washington, but considers Bellingham, Washington, his hometown. Oswald graduated from the U.S. Naval Academy. He became a naval aviator and flew the Corsair II aboard the USS Midway. Oswald then attended the U.S. Naval Test Pilot School and conducted flying quality, performance, and propulsion studies on the A-7 and F/A-18 Hornet. He then became an F/A-18 instructor and later a catapult officer aboard the USS Coral Sea. Oswald resigned from active duty and joined Westinghouse Electric Corporation as a civilian test pilot. He has logged over 5,000 hours of flying time in 40 different kinds of aircraft. Oswald joined NASA as an aerospace engineer and research pilot. He was pilot of the STS-42 mission.



Mission Specialist
Kenneth D. Cockrell (Mr.)
Kenneth Cockrell was born in Austin, Texas. He received a bachelor of science degree in mechanical engineering from the University of Texas and a master of science degree in aeronautical systems from the University of West Florida. After designation as a naval aviator, he flew the Corsair II aboard the USS Midway in the Western Pacific and Indian Oceans. Following graduation from the U.S. Naval Test Pilot School in Maryland, he conducted flight tests on the A-4, A-7, F-4 and F/A-18 aircraft. He was assigned as a pilot in an operational F/A-18 squadron and made two cruises on the USS Constellation. Cockrell resigned his commission to work as a research pilot at NASA's Johnson Space Center. Selected as a pilot astronaut in 1990, he has logged over 5,100 flying hours and 650 carrier landings. This will be his first space flight.

Mission Specialist
Michael Foale (Ph.D.)
Michael Foale was born in Louth, England, but considers Cambridge, England, to be his hometown. He attended the University of Cambridge, Queens' College, receiving a bachelor of arts degree in physics, National Sciences Tripos, with first class honors. While at Queens' College, he completed a doctorate in laboratory astrophysics. As a postgraduate at Cambridge University, Foale participated in the organization and execution of scientific scuba diving projects, including surveying underwater antiquities in Greece. Foale joined NASA Johnson Space Center in 1983 in the payload operations area of the Mission Operations Directorate. He was selected as an astronaut candidate in 1987 and completed a one-year training and evaluation program in 1988. Foale was a mission specialist aboard STS-45.

Mission Specialist
Ellen Ochoa (Ph.D.)
Ellen Ochoa was born in Los Angeles, California, but considers La Mesa, California, to be her hometown. She received a bachelor of science degree in physics from San Diego State University and master of science and doctorate degrees in electrical engineering from Stanford University. Her doctoral dissertation on photorefractive crystals resulted in a patent for a system to detect defects in periodic objects. She is also co-inventor on two additional patents in the field of optics. After joining the NASA Ames Research Center, she was selected as Chief of the Intelligent Systems Technology Branch, serving as technical and administrative head of 35 engineers and scientists researching and developing computational systems for aerospace missions. Ochoa was named an astronaut in 1990. This is her first space flight.



STS-56 Crew Insignia

The STS-56 patch is a pictorial representation of the STS-56/ATLAS-2 mission as seen from the crew's viewpoint. The payload bay is depicted with the ATLAS-2 pallet, Shuttle Solar Backscatter Ultra Violet (SSBUV) experiment, and Spartan, the primary scientific payloads on the flight. ATLAS-2 is a "Mission To Planet Earth," so the Earth is featured prominently. The mission's two primary areas of study are the atmosphere and the sun. To highlight this, the Earth's atmosphere is depicted as a stylized visible spectrum and the sunrise is depicted with an enlarged two-colored corona. The commander's and pilot's names are written in the Earth field and the names of the mission specialists are in the space background.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Teammates,

Congratulations and thanks to you and your SPC teammates for doing an outstanding job of getting Endeavour ready for launch.

Mission Commander Ronald Grabe reports that this Shuttle performed extremely well and enabled the crew to accomplish all their assigned missions.

The crew retrieved the European Retrievable Carrier (EURECA) and utilized the commercially developed SPACEHAB laboratory to conduct valuable research.

In addition, there was a four hour plus space walk to help prepare for the construction and maintenance of the space station.

We have reached the mid point of 1993 and find ourselves right on schedule with four missions completed and four to go.

I am confident that our team will remain "on track" and continue to deliver outstanding performance.

Sincerely,

Gerry T. Oppliger
President

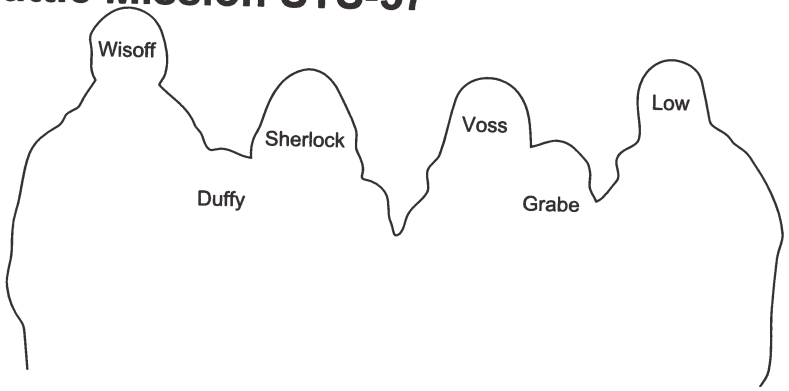
NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-57

National Aeronautics and Space Administration

JSCCL-130

The Crew of Space Shuttle Mission STS-57



Commander
Ronald J. Grabe (Col., USAF)
Ronald Grabe was born in New York, New York. He earned a bachelor of science degree in engineering science from the United States Air Force Academy and studied aeronautics as a Fulbright Scholar at the Technische Hochschule, Darmstadt, West Germany. Upon his return from West Germany, Grabe completed pilot training and flew the F-100 in 200 combat missions in Vietnam. Grabe attended the USAF Test Pilot School and served as a test pilot for the A-7 and F-111. Grabe later served as an exchange test pilot with the Royal Air Force in the United Kingdom in the development programs for the Royal Air Force Harrier and the Royal Navy Sea Harrier. He has logged over 5,000 hours of flying time. Before being selected as a NASA astronaut, Grabe was an instructor at the USAF Test Pilot School. Grabe served as pilot on the STS 51-J and STS-30 missions and as commander on STS-42.

Pilot
Brian Duffy (Col., USAF)
Brian Duffy was born in Boston, Massachusetts. He received a bachelor of science degree in mathematics from the U.S. Air Force Academy and a master of science degree in systems management from the University of Southern California. After graduation from the Air Force Academy, Duffy completed undergraduate pilot training and was selected to fly the F-15. Later, following graduation from the U.S. Air Force Test Pilot School, he served as the Director of F-15 Tests at Eglin Air Force Base, Florida. Duffy became an astronaut in 1986 and served as pilot on the crew of STS-45.

Payload Commander
G. David Low
G. David Low was born in Cleveland, Ohio. He earned a bachelor of science degree in physics-engineering from Washington & Lee University, a bachelor of science degree in mechanical engineering from Cornell University, and a master of science degree in aeronautics and astronautics from Stanford University. He worked in the Spacecraft Systems Engineering Section of the Jet Propulsion Laboratory (JPL), California, where he was involved in the preliminary planning of several planetary missions and also worked on the systems engineering design of the Galileo spacecraft. After a one-year leave to pursue graduate studies, Low returned to JPL, serving as principal spacecraft systems engineer for the Mars Geoscience/Climatology Observer Project. He was selected as an astronaut in 1984. He has flown aboard two Shuttle missions, STS-32 and STS-43.

Mission Specialist
Nancy Jane Sherlock (Capt., USA)
Nancy Jane Sherlock was born in Wilmington, Delaware, but considers Troy, Ohio, to be her hometown. She received a bachelor of arts degree in biological science from Ohio State University and a master of science degree in safety engineering from the University of Southern California. Following her commission in the U.S. Army, Sherlock was assigned to Fort Rucker, Alabama, as a UH-1H instructor pilot and served as a standardization instructor pilot for all phases of rotary wing flight, including combat skills and night vision goggle operations. A Senior Army Aviator, she has logged 2,800 flying hours in 9 different rotary wing and fixed wing aircraft. She was assigned to the NASA Johnson Space Center as a flight simulation engineer on the Shuttle Training Aircraft. Sherlock was named an astronaut in 1990. This will be her first Shuttle flight.

Mission Specialist
Janice E. Voss (Ph.D.)
Janice E. Voss was born in South Bend, Indiana, but considers Rockford, Illinois, to be her hometown. She earned a bachelor of science degree in engineering science from Purdue University, a master of science degree in electrical engineering, and a doctorate in aeronautics/astronautics from the Massachusetts Institute of Technology. While at the NASA Johnson Space Center, she worked as a crew trainer, teaching entry guidance and navigation. After completing her doctorate, she worked at the Orbital Sciences Corporation. Her responsibilities included flight operations support for the transfer orbit stage, an upper stage scheduled for its first flight on the Space Shuttle in 1993. Voss was selected as an astronaut in 1990. This will be her first Shuttle flight.

Mission Specialist
Peter J. K. "Jeff" Wisoff (Ph.D.)
Peter J. K. Wisoff was born in Norfolk, Virginia. He received a bachelor of science degree in physics from the University of Virginia and a master of science degree and doctorate in applied physics from Stanford University. Upon graduation, he joined the faculty of Rice University in the Department of Electrical and Computer Engineering. His research focused on the development of new vacuum ultraviolet and high intensity laser sources. He also worked with researchers from regional Texas medical centers on the use of lasers in rebuilding damaged nerves. Wisoff has contributed numerous papers at technical conferences and in journals in the areas of lasers and laser applications. He was named an astronaut in 1990. This will be his first Shuttle flight.

STS-57 Crew Insignia

The crew insignia depicts the Orbiter maneuvering to retrieve the European Space Agency's microgravity experiment satellite EURECA. The first commercial space laboratory, Spacehab, is shown in the payload bay, and its characteristic shape is represented by the inner red border of the patch. The three gold plumes surrounded by the five stars trailing EURECA are suggestive of the U. S. astronaut logo. The five gold stars together with the shape of the Orbiter's mechanical arm form mission number 57. The six stars on the American flag represent the six U. S. astronauts who comprise the crew.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear SPC Team Member,

I congratulate you and your colleagues for doing such an outstanding job of getting Columbia ready for its STS-58 mission. From all reports, this was a near perfect flow and the absence of significant in-flight anomalies certainly bears this out. Well done!

In addition to the extraordinary amount of science this mission generated, we set a space flight record. At 14 days, this was the longest Shuttle mission we've ever flown.

Commander John Blaha and his astronaut crew conducted many life science tests and biomedical experiments on this, our second Spacelab mission. These will add tremendously to our knowledge about the effect that space flight has on the human body.

I am proud of the good work our team turned in on this mission and I commend you and all the team members for the outstanding results.

Sincerely,

Gerry Oppliger
President

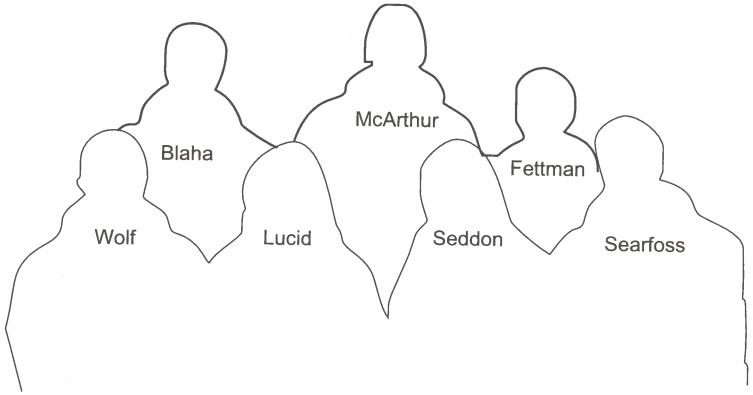
NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-58

National Aeronautics and Space Administration

JSCCL-132

The Crew of Space Shuttle Mission STS-58



Commander
John E. Blaha (Col., USAF)
John Blaha was born in San Antonio, Texas. He received a bachelor of science degree in engineering science from the U.S. Air Force Academy, and a master of science in astronautical engineering from Purdue University. As an operational pilot, he flew F-4, F-102, F-106, and A-37 aircraft and completed 361 combat missions in Vietnam. As a test pilot he flew stability/control, performance, spin, and weapons delivery flight tests in the A-7, F-104, Jaguar, Buccaneer, Hawk and Jet Provost aircraft. Blaha worked for the Assistant Chief of Staff, Studies and Analyses, at USAF Headquarters in the Pentagon, during which time he presented F-15 and F-16 study results to Department of Defense, State Department, and congressional staffs. He has logged 6,000 hours of flying time in 34 different aircraft, and written numerous technical articles on spacecraft performance and control. Blaha was selected as an astronaut in 1980. A veteran of three space flights with 453 hours in space, he served as commander of STS-43 and pilot of STS-33 and STS-29.

Pilot
Richard A. Searfoss (Lt. Col., USAF)
Richard Searfoss was born in Mount Clemens, Michigan, but considers Portsmouth, New Hampshire, his hometown. He earned a bachelor of science degree in aeronautical engineering from the U.S. Air Force Academy in 1978, and master of science degree in aeronautics from the California Institute of Technology on a National Science Foundation Fellowship in 1979. He flew the F-111 as an aircraft commander, instructor pilot, and weapons and tactics officer at Lakenheath, England, and Mountain Home Air Force Base, Idaho. A graduate of the USAF Fighter Weapons School and the U.S. Naval Test Pilot School, Searfoss was a flight instructor at the USAF Test Pilot School at Edwards Air Force Base in California when selected for the astronaut program in 1990. He has logged over 2,500 hours flying time in 54 different types of aircraft. This will be his first space flight.

Payload Commander
M. Rhea Seddon (M.D.)
Rhea Seddon was born in Murfreesboro, Tennessee. She earned a bachelor of arts degree in physiology from the University of California-Berkeley in 1970, and a doctorate in medicine from the University of Tennessee College of Medicine in 1973. Between her surgery internship and residency, Dr. Seddon worked as an emergency room physician at several hospitals in Mississippi and Tennessee, and currently serves in this capacity in the Houston area in her spare time. She has also performed clinical research into the effects of radiation therapy on nutrition in cancer patients. Dr. Seddon became an astronaut in 1979. A two-flight veteran with over 386 hours in space, she served as a mission specialist aboard STS-51D and STS-40.

Mission Specialist
Shannon W. Lucid (Ph.D.)
Shannon Lucid was born in Shanghai, China, but considers Bethany, Oklahoma, her home. She received a bachelor of science degree in chemistry from the University of Oklahoma in 1963, and a master of science and doctor of philosophy degrees in biochemistry from the University of Oklahoma in 1970 and 1973, respectively. Dr. Lucid's experience includes a variety of academic assignments, including working as a chemist at Kerr-McGee in Oklahoma City, Oklahoma; and research associate with the Oklahoma Medical Research Foundation in Oklahoma City. She is a commercial, instrument, and multi-engine rated pilot. Since becoming an astronaut in 1979, her work has included serving as Chief of Mission Support and Chief of Astronaut Appearances. A veteran of three space flights, Dr. Lucid served as a mission specialist aboard STS-51G, STS-34, and STS-43.

Mission Specialist
William S. "Bill" McArthur, Jr. (Lt. Col., USA)
William "Bill" McArthur, Jr., was born in Laurinburg, North Carolina, but calls Wakulla, North Carolina, his hometown. He earned a bachelor of science degree in applied science and engineering from the U.S. Military Academy at West Point, New York, in 1973, and a master of science degree in aerospace engineering from the Georgia Institute of Technology in 1983. He has served in a variety of Army assignments including the 2nd Infantry Division in the Republic of Korea, the 24th Infantry Division in Savannah, Georgia, and the 82nd Airborne Division in Fort Bragg, North Carolina. Following completion of studies at Georgia Tech, he worked in the Department of Mechanics at West Point as an assistant professor. Military schools completed include the Army Parachutist, and the Command and General Staff Officer's Courses. A Master Army Aviator, he has logged over 2,800 flight hours in 36 different aircraft. McArthur became an astronaut in 1991. This will be his first space flight.

Mission Specialist
David A. Wolf (M.D.)
David Wolf was born in Indianapolis, Indiana. He earned a bachelor of science degree in electrical engineering from Purdue University in 1978, and a doctorate in medicine from Indiana University in 1982. At the NASA Johnson Space Center in Houston, Texas, he was assigned to direct development of the Space Bioreactor and associated cancer research and tissue culture applications which utilize controlled gravitational conditions. His expertise includes designing real-time computer process control systems, bioprocessing, and human aerospace physiology. Dr. Wolf was named NASA Inventor of the Year in 1992, and carries patents on a new class of 3-dimensional human tissue culture instrumentation. He is a flight surgeon in the Air National Guard, and has logged over 500 hours of air combat training as a weapons systems officer in the F-4 Phantom jet. He is also a proficient aerobatic pilot, primarily flying the Pitts Special and Christen Eagle airplanes. Dr. Wolf became an astronaut in 1991. This will be his first space flight.

Payload Specialist
Martin J. Fettman (B.S., D.V.M., M.S., Ph.D., Diplomate, ACVP)
Martin Fettman was born in Brooklyn, New York. He received a bachelor of science degree in animal nutrition from Cornell University in 1976, doctor of veterinary medicine degree and master of science degree in nutrition from Cornell University in 1980, and doctor of philosophy degree in physiology from Colorado State University in 1982. He is a diplomate of the American College of Veterinary Pathologists, and a professor of pathology at Colorado State University, where he also holds the Mark L. Morris chair in clinical nutrition. Dr. Fettman spent one year's sabbatical leave as a visiting professor of medicine at The Queen Elizabeth Hospital and University of Adelaide in South Australia, studying the biochemical epidemiology of human colon cancer. He has published over 100 research articles in referred scientific journals. Selected as a payload specialist in 1991, this mission is Dr. Fettman's first affiliation with NASA.

STS-58 Crew Insignia

The crew patch shows the Orbiter Columbia in orbit around the Earth with a Spacelab module in its payload bay. The Spacelab and the lettering "Spacelab Life Sciences II" highlight the primary mission of the second Space Shuttle flight dedicated to life science research. An EDO (Extended Duration Orbiter) support pallet is shown in the aft payload bay, stressing the scheduled two-week duration of this longest Shuttle mission to date. The hexagonal shape of the patch depicts the carbon ring, a molecule common to all living organisms. Encircling the inner border of the patch is the double helix of DNA, representing the genetic basis of life. Its yellow background is the color of the sun, energy source for all life on Earth. Both medical and veterinary caducei are shown to represent the STS-58 life science experiments. Finally, the position of the spacecraft in orbit about the Earth with the United States in the background symbolizes the ongoing support of the American people for scientific research intended to benefit all mankind.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Team Member,

I'd like to extend my congratulations to you and your teammates for the successful processing and launch of Endeavour on STS-59. Thanks for a job very well done.

As you know, strong crosswinds at the Shuttle Landing Facility delayed our launch for twenty-four hours, but during our countdown on both Friday and Saturday mornings, no serious technical problems arose - the processing team had done its job extremely well.

Mission Commander Sid Gutierrez and his astronaut crew were able to operate the Space Radar Laboratory to full advantage as they studied how our global environment is changing. Utilizing imaging radar and an atmospheric instrument, the crew studied Earth's vegetation, hydrology, tectonics, topography and global carbon monoxide distribution.

We can all be very proud of the crucial support we provided to this important scientific research.

Sincerely,

Gerry Oppliger
President

NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-59

National Aeronautics and Space Administration

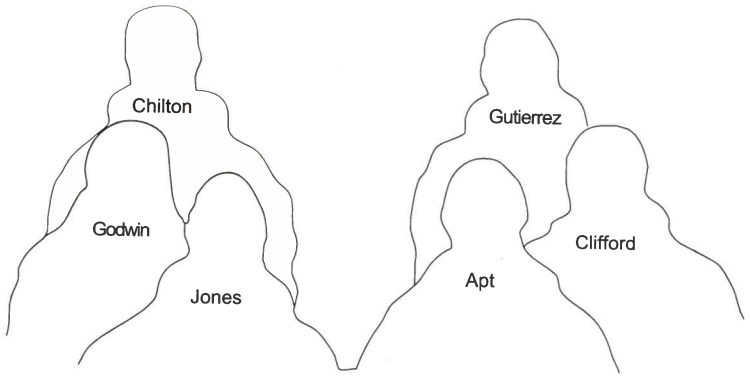
JSCCL-136

The Crew of Space Shuttle Mission STS-59

Commander
Sidney M. Gutierrez (Col., USAF)
Sid Gutierrez was born in Albuquerque, New Mexico. He received a bachelor of science degree in aeronautical engineering from the U. S. Air Force Academy in 1973 and a master's degree in management from Webster College in 1977. He served as a T-38 instructor pilot and flew the F-15 Eagle with the 49th Tactical Fighter Wing. After graduating from the U. S. Air Force Test Pilot School, Gutierrez served as primary test pilot for airframe and propulsion testing on the F-16 Falcon. He has over 500 parachute jumps and more than 4,000 flying hours in approximately 30 different types of airplanes, sailplanes, balloons, and rockets. Gutierrez was named an astronaut in 1984 and flew as pilot on STS-40 in 1991.

Pilot
Kevin P. Chilton (Col., USAF)
Kevin Chilton was born in Los Angeles, California. He earned a bachelor of science degree in engineering sciences from the U.S. Air Force Academy and a master of science degree in mechanical engineering from Columbia University. After graduating from Air Force pilot training, he served as a combat-ready pilot and instructor in the RF-4 Phantom II and the F-15 Eagle. Following graduation from the USAF Test Pilot school, he conducted weapons and systems tests in all models of the F-15 and F-4. He has logged over 4,000 hours of flight time in more than 20 different types of aircraft. Chilton became an astronaut in 1988 and flew as the pilot of Mission STS-49.

Mission Specialist
Linda M. Godwin (Ph.D.)
Linda Godwin was born in Cape Girardeau, Missouri, but considers Jackson, Missouri, to be her hometown. She earned a bachelor of science degree from Southeast Missouri State University in physics and mathematics and an MA and Ph.D. in physics from the University of Missouri, Columbia. While at the University of Missouri, she conducted research in low temperature condensed matter physics where she authored and co-authored several scientific papers. She is an instrument rated private pilot. She joined NASA in 1980 and served as a flight controller and payloads officer in Mission Control for several Shuttle flights. Godwin was selected as an astronaut in 1985 and is currently Deputy Chief of the Astronaut Office. She previously flew in space as a mission specialist on STS-37.



Mission Specialist
Thomas D. Jones (Ph.D.)
Thomas David Jones was born in 1955 in Baltimore, Maryland. He earned a bachelor of science degree in basic sciences from the U. S. Air Force Academy and a Ph.D. in planetary sciences from the University of Arizona. As an Air Force officer, he served as a B-52 strategic bomber pilot and aircraft commander, accumulating over 2,000 hours of flight experience. After leaving the Air Force, Jones worked toward his doctorate, using remote sensing to investigate the composition of asteroids and meteorites, and researching the utility of asteroid resources in space exploration. He was a program management engineer for the CIA's Office of Development and Engineering and later a senior scientist at Science Applications International Corporation, analyzing future missions to Mars, asteroids, and the outer solar system. He was selected as an astronaut by NASA in 1990. STS-59, the Space Radar Lab (SRL-1) mission, will be his first Shuttle flight. Jones will fly again as payload commander on STS-68, the second SRL mission.

Mission Specialist
Jay Apt (Ph.D.)
Jay Apt was born in Springfield, Massachusetts, but considers Pittsburgh, Pennsylvania, to be his hometown. He received a bachelor of arts degree, magna cum laude, in physics from Harvard College, and a doctorate in physics from the Massachusetts Institute of Technology. As a staff member of Harvard's Center for Earth and Planetary Physics, he supported NASA's Pioneer Venus Mission. While at NASA's Jet Propulsion Laboratory, Apt studied Venus, Mars, and the outer solar system and was Science Manager of the Table Mountain Observatory. From 1982 until his selection as an astronaut in 1985, he was a flight controller responsible for Shuttle payload operations at NASA's Johnson Space Center. He has logged over 3,000 hours flying time in some 30 different types of airplanes, sailplanes and human-powered aircraft. Apt served as a mission specialist on the STS-37 mission during which he performed two space walks. He was responsible for operating Endeavour 12 hours per day during the STS-47 mission. He has logged 334 hours on these two missions, including 10 hours and 49 minutes on two space walks (extravehicular activity).

Mission Specialist
Michael Richard Clifford (LTC, USA)
Rich Clifford was born in San Bernadino, California, but considers Ogden, Utah, to be his hometown. He earned a bachelor of science degree from the United States Military Academy and a master of science degree in aerospace engineering from the Georgia Institute of Technology. Upon graduation from West Point, Clifford served with the 10th Cavalry. He then completed pilot training as the top graduate of his class. He served in a variety of positions with the 2nd Armored Cavalry Regiment in Germany and was an assistant professor of mechanical engineering at West Point. Clifford became an experimental test pilot following graduation from the U. S. Naval Test Pilot School in 1986. He has flown over 3,000 hours in more than 50 types of fixed and rotary wing aircraft. Clifford became an astronaut in 1990. He flew as a mission specialist on STS-53 aboard Discovery in December 1992.

STS-59 Crew Insignia

The Earth dominates the STS-59 crew insignia, reflecting the focus of the first Space Radar Laboratory (SRL-1) mission on our planet's surface and atmosphere. The golden symbol of the astronaut corps emblem sweeps over the Earth's surface from the Orbiter Endeavour, representing the operation of the SIR-C/X-SAR (synthetic aperture radar) and the MAPS (measurement of air pollution from space) sensors. The astronaut emblem also signals the importance of the human element in space exploration and in the study of our planet. Using the unique vantage point of space, Endeavour and its crew–along with scientists from around the world–will study the Earth and its atmosphere to better understand the environment. The star field visible below the Earth represents the many talents and skills of the international SRL-1 team in working to make this "Mission to Planet Earth" a scientific and operational success.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Teammember,

Our first launch of 1994, STS-60, was outstanding! The preparation of Discovery and the countdown proceeded very smoothly and, once again, we were able to give Commander Charlie Bolden and his astronaut crew a very well prepared Shuttle in which to perform their mission.

The crew utilized the SPACEHAB 2 module to conduct seven important life science and four materials science investigations. In addition, on flight day three, they used the Wake Shield Facility to experiment with growing almost defect-free thin-film layers of gallium arsenide, indium phosphide and other types of semiconductor material on wafer substrates. These materials will lead to great advances in computers, video telephones and fully interactive televisions.

The presence of Sergei Krikalev, the first Russian cosmonaut to fly in a Space Shuttle, signals the reality of the emerging U.S.-Russia cooperation in space endeavors.

Many thanks for another great job!

Sincerely,

Gerry Oppliger
President

STS-60
CREW PATCH DESCRIPTION

The design of the crew patch for Mission STS-60 depicts the Space Shuttle *Discovery's* on-orbit configuration. The American and Russian flags symbolize the partnership of the two countries and their crew members taking flight into space together for the first time. The open payload bay contains: the Space Habitation Module (Spacehab), a commercial space laboratory for life and material science experiments; and a Get Away Special Bridge Assembly in the aft section carrying various experiments, both deployable and attached. A scientific experiment to create and measure and ultra-vacuum environment and perform semiconductor material science--the Wake Shield Facility--is shown on the Remote Manipulator System prior to deployment.

ОПИСАНИЕ ЭМБЛЕМЫ ЭКИПАЖА СТС-60

На эмблеме экипажа миссии СТС-60 изображен космический корабль многоразового использования Дискавери в полетной конфигурации. Американский и русский флаги символизируют сотрудничество двух стран и их представителей в экипаже корабля, впервые предпринимающих совместный полет в космос. Открытый отсек полезной нагрузки содержит: экспериментальный космический модуль Спейсхэб, представляющий собою коммерческую космическую лабораторию для проведения экспериментов в области биологии и материаловедения, и специальный стенд в хвостовой части, на котором устанавливаются приборы для проведения различных оригинальных экспериментов как на борту, так и посредством отделения. На эмблеме также показана установка Вейк Шилд в положении перед отделением, расположенная на манипуляторе. Установка предназначена для создания сверхвакуумной среды и проведения экспериментов с полупроводниковыми материалами.

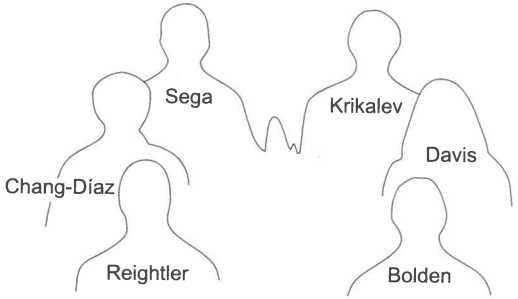
NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-60

National Aeronautics and Space Administration

JSCCL-134

The Crew of Space Shuttle Mission STS-60



Commander
Charles F. Bolden, Jr. (Col., USMC)
Charles Bolden was born in Columbia, South Carolina. He earned a bachelor of science degree in electrical science from the United States Naval Academy and a master of science in systems management from the University of Southern California. After graduating from the Naval Academy, Bolden accepted a commission in the U.S. Marine Corps. As a naval aviator, he flew more than 100 sorties into North and South Vietnam, Laos, and Cambodia, in the A-6A Intruder. Following his return to the United States, Bolden graduated from the U.S. Naval Test Pilot School at Patuxent River, Maryland, served as an ordnance test pilot, and flew numerous test projects in the A-6E, EA-6B, and A-7C/E airplanes. He has logged more than 6,000 hours flying time. Bolden became an astronaut in 1981 and has flown in space three times: as pilot of STS-61C and STS-31 missions and commander of STS-45.

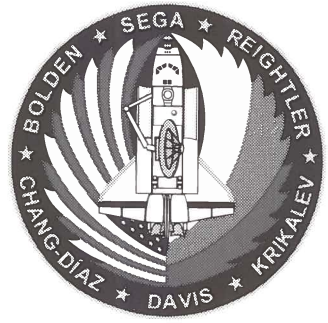
Pilot
Kenneth S. Reightler, Jr. (Capt., USN)
Ken Reightler was born in Patuxent River, Maryland, but considers Virginia Beach, Virginia, his hometown. He earned a bachelor of science degree in aerospace engineering from the U.S. Naval Academy in 1973, and in 1984 master of science degrees in aeronautical engineering from the U.S. Naval Postgraduate School and in systems management from the University of Southern California. After earning his "Wings of Gold," he completed an operational flying tour with VP-16 in Jacksonville, Florida. At the U.S. Naval Air Test Center at Patuxent River, he served as a test pilot and project officer for a variety of flight test programs involving the P-3, S-3, and T-39 airplanes. He then returned to the U.S. Naval Test Pilot School, serving as a flight test instructor and safety officer. While aboard the USS Dwight D. Eisenhower (CVN-69) as communications officer and COD pilot, Reightler made two deployments to the Mediterranean Sea. He later served as Chief Flight Instructor at the Naval Test Pilot School before becoming an astronaut in 1988. He was the pilot aboard STS-48.

Payload Commander
Franklin R. Chang-Díaz (Ph.D.)
Franklin Chang-Díaz was born in San José, Costa Rica. He earned a bachelor of science degree in mechanical engineering from the University of Connecticut and a doctorate in applied plasma physics from the Massachusetts Institute of Technology. During graduate school at MIT, he worked in the United States' controlled fusion program, doing research in the design and operation of fusion reactors. After being selected as an astronaut, he was appointed Visiting Scientist with the MIT Plasma Fusion Center where he led, until 1993, the Plasma Propulsion Group. He continues his research in rocket propulsion as an adjunct professor of physics with the University of Houston where he directs the Advanced Plasma Propulsion Laboratory. While living in Massachusetts, he also worked as a house manager in a program for deinstitutionalizing chronic mental patients, and as an instructor/advisor with a rehabilitation program for Hispanic drug abusers. He has logged over 1,500 hours of flight time. Chang-Díaz was named an astronaut in 1981. He has flown in space three times: as mission specialist aboard STS-61C, STS-34 and STS-46.

Mission Specialist
Ronald M. Sega (Ph.D.)
Ronald Sega was born in Cleveland, Ohio, but considers Northfield, Ohio, and Colorado Springs, Colorado, his hometowns. He earned a bachelor of science degree in mathematics and physics from the U.S. Air Force Academy in 1974, a master of science degree in physics from Ohio State in 1975, and a doctorate in electrical engineering from the University of Colorado in 1982. He has since been a member of the faculty of the University of Colorado, Colorado Springs, where he is currently a professor in the Department of Electrical and Computer Engineering. While on leave from the University of Colorado, he was research associate professor of physics at the University of Houston, affiliated with the Space Vacuum Epitaxy Center, and is now adjunct professor of physics. Dr. Sega has authored or co-authored over 70 technical publications. A lieutenant colonel in the Air Force Reserves, he has logged over 4,000 hours as a pilot in the Air Force, Air Force Reserves and NASA. He became an astronaut in 1991. This is his first space flight.

Mission Specialist
N. Jan Davis (Ph.D.)
Jan Davis was born in Cocoa Beach, Florida, but considers Huntsville, Alabama, to be her hometown. She earned bachelor of science degrees in applied biology from Georgia Institute of Technology and in mechanical engineering from Auburn University, and a master of science degree and a doctorate in mechanical engineering from the University of Alabama, Huntsville. Her graduate research was on the long-term viscoelastic strength of composite pressure vessels. As an aerospace engineer for NASA's Marshall Space Flight Center in Huntsville, she was responsible for the structural analysis and verification of Shuttle payloads. She was also the lead engineer for the redesign of the solid rocket booster external tank attach ring. Davis was named an astronaut in 1987 and has flown once before in space as a mission specialist aboard STS-47.

Cosmonaut
Sergei Konstantinovich Krikalev
Sergei Krikalev was born in Leningrad, Russia, which has been renamed St. Petersburg. He received a mechanical engineering degree from the Leningrad Mechanical Institute, now called St. Petersburg Technical University. Krikalev was selected as a cosmonaut in 1985, and, for a time, was assigned to the Buran Shuttle Program. In 1988, he began training for his first long-duration flight aboard the Mir Space Station. Soyuz TM-7 was launched in November 1988, with Krikalev serving as flight engineer. He remained aboard Mir conducting experiments before returning to Earth in April 1989. Krikalev began his second space flight on Soyuz TM-12 in May 1991, again as flight engineer. During that summer, he participated in six EVAs to perform a variety of experiments and space station maintenance tasks. Krikalev continued working aboard Mir until his return to Earth in March 1992. With the completion of his second mission, Krikalev has logged more than one year and three months in space, and conducted seven EVAs.



STS-60 Crew Insignia

The STS-60 mission patch depicts the Space Shuttle Discovery's on-orbit configuration. The American and Russian flags symbolize the partnership of the two countries and their crew members taking flight into space together for the first time. The open payload bay contains: the Space Habitation Module (Spacehab), a commercial space laboratory for life and material science experiments; and a Get Away Special Bridge Assembly in the aft section carrying various experiments, both deployable and attached. A scientific experiment to create and measure an ultra-vacuum environment and perform semiconductor material science--the Wake Shield Facility--is shown on the Remote Manipulator System prior to deployment.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Team Member,

I know NASA didn't consciously "save the best for last", but that's the way it worked out! Our STS-61 Hubble Servicing Mission - the last on the manifest for 1993 - was one of the most important scientific missions in the history of the Shuttle program.

Certainly a large part of the credit for the success of this mission, with its record setting "space walks", goes to our SPC workforce for your superb performance in getting Endeavour ready for launch.

Well done and many thanks to everyone for a great job.

I'd also like to extend to everyone my best wishes for a happy, safe and fulfilling holiday season.

Sincerely,

Gerry Oppliger

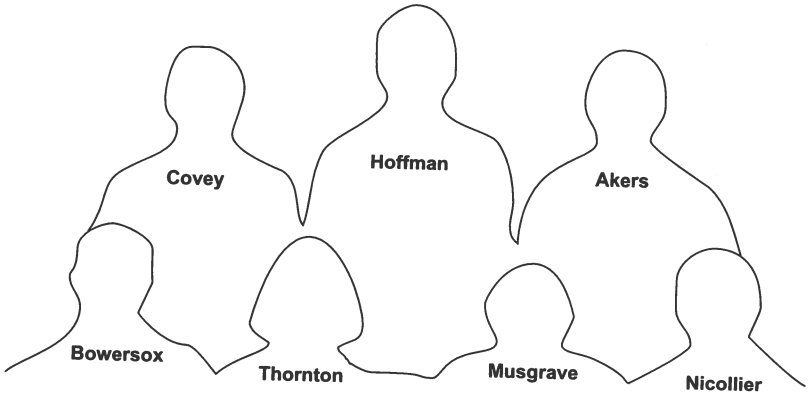
NASA National Aeronautics and Space Administration

Crew of Space Shuttle Mission STS-61

National Aeronautics and Space Administration

JSCCL-133

The Crew of Space Shuttle Mission STS-61



Commander
Richard O. Covey (Col., USAF)
Richard O. Covey was born in Fayetteville, Arkansas, but considers Fort Walton Beach, Florida, his hometown. He earned a bachelor of science degree in engineering sciences from the U.S. Air Force Academy in 1968, and a master of science degree in aeronautics and astronautics from Purdue University in 1969. Between 1970 and 1974, Covey was an operational fighter pilot, flying the F-100, A-37, and A-7D. He flew 339 combat missions in Southeast Asia and was awarded five Distinguished Flying Crosses. At Eglin Air Force Base in Florida, he was a test pilot for the F-4 and A-7D weapons systems, as well as joint test force director for electronic warfare testing of the F-15 Eagle. Covey has flown over 5,000 hours in more than 30 different types of aircraft. Named an astronaut in 1979, he has flown in space three times: as pilot aboard STS 51-I and STS-26, and as commander of STS-38.

Pilot
Kenneth D. Bowersox (Lt. Cmdr., USN)
Kenneth Bowersox was born in Portsmouth, Virginia, but Bedford, Indiana, is his hometown. He received a bachelor of science degree in aerospace engineering from the U.S. Naval Academy and a master of science degree in mechanical engineering from Columbia University. He served as a fleet A-7E pilot aboard the USS Enterprise in Light Attack Squadron 22, performing more than 300 carrier landings. After graduating from the USAF Test Pilot School at Edwards Air Force Base in California, he served as a test pilot, flying A-7E and F/A-18 aircraft at the China Lake Naval Weapons Center. He has logged over 3,000 hours flying time. Bowersox became an astronaut in 1987 and has flown in space once before as pilot of STS-50.

Mission Specialist
Kathryn C. Thornton (Ph.D.)
Kathryn Thornton was born in Montgomery, Alabama. She earned a bachelor of science degree in physics from Auburn University and master of science and doctorate of philosophy degrees in physics from the University of Virginia. She was awarded a NATO Postdoctoral Fellowship at the Max Planck Institute for Nuclear Physics in Heidelberg, Germany, and later worked as a physicist at the U.S. Army Foreign Science and Technology Center. Thornton, who became an astronaut in 1985, was a mission specialist aboard Mission STS-33 and STS-49.

Mission Specialist (ESA)
Claude Nicollier
Claude Nicollier was born in Vevey, Switzerland. He holds a bachelor of science degree in physics from the University of Lausanne and a master of science degree in astrophysics from the University of Geneva. In 1978, he was selected by the European Space Agency (ESA) as a member of the first group of European astronauts. Under an agreement between ESA and NASA, he joined the astronaut candidate class of 1980 to begin training as a mission specialist. He holds a commission as captain in the Swiss Air Force and has logged 5,000 hours flying time, including 3,400 hours in jet aircraft. He is a 1988 graduate of the Empire Test Pilot's School. Nicollier served as a mission specialist aboard STS-46 in 1992.

Mission Specialist
Jeffrey A. Hoffman (Ph.D.)
Jeffrey Hoffman was born in Brooklyn, New York, but considers Scarsdale, New York, to be his hometown. He earned a bachelor of arts degree in astronomy from Amherst College, a doctor of philosophy degree in astrophysics from Harvard University, and a master of science degree in materials science from Rice University. After receiving his Ph.D., he worked at Leicester University in England and at the Massachusetts Institute of Technology in the field of X-ray astronomy. He became an astronaut in 1979. He has worked on the testing of Shuttle guidance, navigation, and control systems; crew training; the development of satellite deployment procedures; payload safety; and the development of advanced, high-pressure space suits. He has flown three times in space: as a mission specialist on STS-51D, where he made the first Shuttle contingency spacewalk, as a mission specialist on the STS-35 ASTRO-1 mission, and as payload commander on STS-46.

Payload Commander
Story Musgrave (M.D.)
Story Musgrave was born in Boston, Massachusetts, but considers Lexington, Kentucky, to be his hometown. Musgrave joined the U.S. Marine Corps and served as an aviation electrician, instrument technician, and aircraft crew chief. He later enrolled at Syracuse University and earned a bachelor of science degree in mathematics and statistics. At the University of California at Los Angeles, he earned a master of business administration degree in operations analysis and computer programming. He also earned a bachelor of arts degree in chemistry from Marietta College and a doctorate in medicine from Columbia University. At the University of Kentucky, Musgrave received a master of science degree in physiology and biophysics and at the University of Houston he received a master of arts degree in literature. He did his surgical internship at the University of Kentucky Medical Center and conducted research in aerospace medicine. Musgrave has earned U.S. Air Force wings and several FAA ratings, including airline transport pilot, and is an accomplished parachutist. He has flown more than 17,000 hours in 160 types of aircraft. Musgrave became a NASA scientist-astronaut in 1967. He was a backup science-pilot for the first Skylab mission and has flown in space four times: as a mission specialist on STS-6, STS-51F, STS-33, and STS-44 missions.

Mission Specialist
Thomas D. Akers (Lt. Col., USAF)
Tom Akers was born in St. Louis, Missouri, but was raised and educated in his hometown of Eminence, Missouri. He received bachelor and master of science degrees in applied mathematics from the University of Missouri at Rolla. He worked four years as the high school principal in Eminence before joining the Air Force. As a flight test engineer, he worked on several weapons development programs while flying F-4 and T-38 aircraft. Akers was named an astronaut in 1988 and served as a mission specialist aboard STS-41 and STS-49.

STS-61 Crew Insignia

The STS-61 emblem depicts the astronaut symbol superimposed against the sky with the Earth underneath, along with two circles which represent the optical configuration of the Hubble Space Telescope. Light is focussed by reflections from a large primary mirror and a smaller secondary mirror. It is analyzed by various instruments and brings to us on Earth knowledge about planets, stars, galaxies and other celestial objects, allowing us to better understand the complex physical processes at work in the universe. The Space Shuttle Endeavour is also represented as the fundamental tool that allows us to perform the first servicing of the Hubble Space Telescope so that its scientific deep space mission may be extended for several years to come. The overall design of the emblem, with lines converging to a high point, is also a symbolic representation of the large scale Earth-based effort--which involves space agencies, industry, and universities--to reach goals of knowledge and perfection.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Teammember,

STS-62 was probably the smoothest mission in the history of the Shuttle program. The processing flow went extremely well and the countdown proceeded right on track to a flawless on-time launch.

Columbia was so well prepared for this launch that Col. John Casper and his astronaut crew were able to accomplish a demanding schedule of experiments on this 14 day mission - the first Extended Duration Orbiter flight of 1994.

Interestingly, this is one of the Shuttle crews which includes astronauts from the Army, the Navy, the Air Force and the Marine Corps.

My sincere thanks to you and your colleagues for the outstanding expertise and hard work which made this success possible.

Sincerely,

Gerry Oppliger
President

LOOK TO LOCKHEED FOR LEADERSHIP

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NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission STS-62

National Aeronautics and Space Administration

JSCCL-135

The Crew of Space Shuttle Mission STS-62

Commander

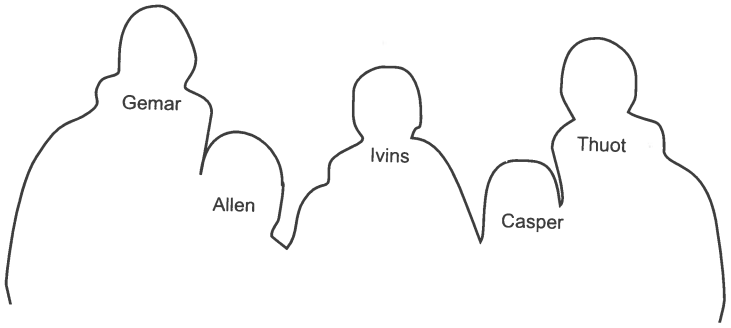
John H. Casper (Col., USAF)

John Casper was born in Greenville, South Carolina, but calls Gainesville, Georgia, home. He earned a bachelor of science degree from the U.S. Air Force Academy and a master of science degree in astronautics from Purdue University. He was a fighter pilot in the F-100 and F-4 and flew 229 combat missions in Vietnam. As a test pilot at the Air Force Flight Test Center, Casper was Chief, F-4E Test Team, and later commanded the 6513th Test Squadron. Assigned to Air Force Headquarters, he served as deputy chief of special projects for the Deputy Chief of Staff, Plans and Operations. Casper became an astronaut in 1984. He was lead astronaut for improving the Orbiter nosewheel steering, brakes, tires, and development of the landing drag chute. He also was an ascent/entry spacecraft communicator (CAPCOM) in the Mission Control Center. In 1990 Casper was pilot for STS-36, a classified Department of Defense mission. In 1993 he commanded STS-54, which deployed a Tracking and Data Relay Satellite. Casper has flown nearly 7,000 hours in 50 different aircraft, logging 250 hours of space flight.

Pilot

Andrew M. Allen (Maj., USMC)

Andrew Allen was born in Philadelphia, Pennsylvania. He received a bachelor of science degree in mechanical engineering from Villanova University. Following graduation from the United States Marine Corps flight school, he flew F-4 Phantoms and was later selected by USMC Headquarters for fleet introduction of the F/A-18 Hornet.



Allen also is a graduate of the Navy Fighter Weapons School (Top Gun) and the U.S. Naval Test Pilot School. He has logged over 4,000 flight hours in more than 30 different aircraft. He became an astronaut in 1988 and flew as pilot aboard STS-46.

Mission Specialist

Pierre J. Thuot (Commander, USN)

Pierre Thuot was born in Groton, Connecticut, but considers Fairfax, Virginia, and New Bedford, Massachusetts, to be his hometowns. He received a bachelor of science degree in physics from the U.S. Naval Academy and a master of science degree in systems management from the University of Southern California. He flew the F-14 Tomcat and made deployments to the Mediterranean and Caribbean Seas while serving aboard the carriers USS John F. Kennedy and USS Independence. He has also worked as a project test flight officer at the Naval Air Test Center, flying the F-14A Tomcat, A-6E Intruder, and the F-4J Phantom II. Thuot has recorded over 3,100 flight hours and made more than 270 carrier landings. He became an astronaut in 1986 and flew as a mission specialist aboard STS-36 and STS-49.

Mission Specialist

Charles D. Gemar (LTC, USA)

Charles Gemar was born in Yankton, South Dakota, but considers Scotland, South Dakota, his hometown. He received a bachelor of science in engineering from the United States Military Academy. Upon graduation, he attended both the Army rotary wing and multi-engine fixed wing aviation courses. Before joining NASA, Gemar served in a number of aviation assignments with the 24th Infantry Division and Hunter Army Airfield. Gemar flew as a mission specialist on STS-38 and STS-48.

Mission Specialist

Marsha S. Ivins

Marsha Ivins was born in Baltimore, Maryland. She earned a bachelor of science degree in aerospace engineering from the University of Colorado. She worked as an engineer in Man Machine Engineering, as a flight simulation engineer on the Shuttle Training Aircraft, and as co-pilot of the NASA administrative aircraft at the Johnson Space Center before being selected as an astronaut in 1984. Ivins, who has logged more than 5,100 hours in civilian and NASA aircraft, flew as a mission specialist aboard STS-32 and STS-46.

STS-62 Crew Insignia

The Space Shuttle Columbia, the world's first reusable spacecraft on its sixteenth flight, is depicted in its entry-interface attitude as it prepares to return to home planet Earth. The primary mission objectives of STS-62 include the United States Microgravity Payload (USMP-2) and the Office of Aeronautics and Space Technology (OAST-2) payloads. These payloads represent a multifaceted array of space science and engineering experiments. The hues of the rainbow on the horizon connote the varied, but complementary, nature of all the payloads united on the mission. The upward-pointing vector shape of the patch is symbolic of America's reach for excellence in its unswerving pursuit to explore the frontiers of space. The brilliant sunrise just beyond Columbia suggests the promise that research in space holds for the hopes and dreams of future generations.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

February 15, 1995

Dear Team Member,

Our first launch in 1995, Discovery on STS-63 was an outstanding success. Our team did a great job of replacing a balky IMU in less than twenty-four hours and the launch took place on Feb. 3 right on time. In fact it had to go "on time" because we had only a five minute launch window to work with.

I think the entire launch team deserves a lot of credit for rising to the challenge and getting Discovery launched under these most demanding conditions.

This was an especially important mission because it helped prepare for a series of dockings with the Russian Mir Space Station and paves the way for a permanently occupied International Space Station.

Obviously, our team picked up where we left off at the end of 1994 - we continued to perform our processing assignments in an outstanding manner.

Thanks to all for the good work.

Sincerely,

Gerry Oppliger
President

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-63

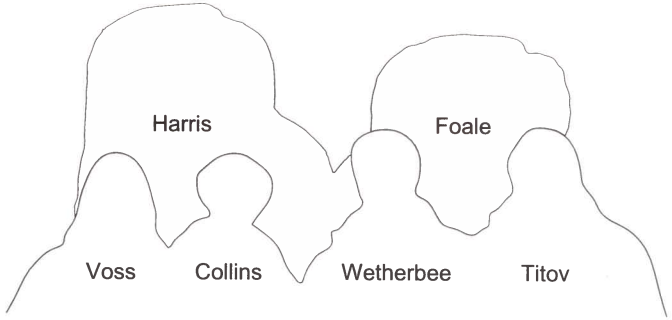
National Aeronautics and Space Administration

JSCCL-141

The Crew of Space Shuttle Mission STS-63

Commander
James D. Wetherbee (Cmdr., USN)
James Wetherbee was born in Flushing, New York. He earned a bachelor of science degree in aerospace engineering from the University of Notre Dame. After being designated a Naval Aviator, he served aboard the USS John F. Kennedy, where he performed 125 night carrier landings in the A-7E aircraft. While at the Systems Engineering Test Directorate, Wetherbee was a project officer and test pilot for the weapons delivery system and avionics integration of the F/A-18 aircraft. He has logged over 4,200 hours flying time and 345 carrier landings in 20 different types of aircraft. Wetherbee became an astronaut in 1985. He served as pilot on the crew of STS-32 and as commander of STS-52.

Pilot
Eileen Marie Collins (Lt. Col., USAF)
Eileen Collins was born in Elmira, New York. She received an associate of science degree in mathematics/science from Corning Community College, a bachelor of arts in mathematics/economics from Syracuse University, a master of science in operations research from Stanford University, and a master of arts in space systems management from Webster University. Collins graduated from pilot training at Vance AFB where she was a T-38 instructor pilot. Next, she was assigned to Travis AFB as a C-141 aircraft commander and instructor pilot. She was later assigned to the U.S. Air Force Academy where she was an assistant professor in mathematics and a T-41 instructor pilot. She graduated from the Air Force Test Pilot School at Edwards AFB and was selected as an astronaut in 1990. Collins has logged over 4,000 hours in 30 different types of aircraft. This will be her first flight.



Payload Commander
Bernard A. Harris, Jr. (M.D.)
Bernard Harris, Jr., was born in Temple, Texas. He earned a bachelor of science degree in biology from the University of Houston and doctorate in medicine from Texas Tech University School of Medicine. After completing his residency training in internal medicine at the Mayo Clinic, he worked at the NASA Ames Research Center as a National Research Council Fellow in the field of musculoskeletal physiology and disuse osteoporosis. He then joined NASA Johnson Space Center as a clinical scientist and flight surgeon, conducting clinical research of space adaptation and how to counter the effects of extended space flight. Harris is the author and co-author of numerous scientific publications, and also a licensed private pilot. He was named an astronaut in 1990 and flew as a mission specialist aboard STS-55.

Mission Specialist
C. Michael Foale (Ph.D.)
C. Michael Foale was born in Louth, England, but considers Cambridge, England, to be his hometown. He attended the University of Cambridge, Queens' College, receiving a bachelor of arts degree in physics, National Sciences Tripos, with first class honors. While at Queens' College, he completed a doctorate in laboratory astrophysics. As a postgraduate at Cambridge University, Foale participated in the organization and execution of scientific scuba diving projects, including surveying underwater antiquities in Greece. Foale joined NASA Johnson Space Center in 1983 in the payload operations area of the Mission Operations Directorate. He was selected as an astronaut candidate in 1987 and completed a one-year training and evaluation program in 1988. Foale was a mission specialist aboard STS-45 and STS-56.

Mission Specialist
Janice E. Voss (Ph.D.)
Janice E. Voss was born in South Bend, Indiana, but considers Rockford, Illinois, to be her hometown. She earned a bachelor of science degree in engineering science from Purdue University, a master of science degree in electrical engineering, and a doctorate in aeronautics/astronautics from the Massachusetts Institute of Technology. At NASA Johnson Space Center, she also worked as a crew trainer, teaching entry guidance and navigation. After completing a doctorate, she worked at the Orbital Sciences Corporation. Her responsibilities included flight operations support for the Transfer Orbit Stage, which flew on the Space Shuttle in 1993. Voss was selected as an astronaut in 1990 and was a mission specialist aboard STS-57.

Mission Specialist
Vladimir Georgievich Titov (Col., Russian Air Force)
Vladimir Georgievich Titov was born in Sretensk, in the Chita Region of Russia. He is a graduate of the Higher Air Force College in Chernigov in the Ukraine and the Yuri Gagarin Air Force Academy. Titov served at the College as a pilot-instructor. He has flown 10 different types of aircraft, and has logged more than 1,500 hours flying time. Titov served as commander on Soyuz T-8, Soyuz T-10, Soyuz TM-4 and Soyuz TM-6. He has logged a total of 13 hours 47 minutes of EVA, and has spent a total of 367 days in space. In 1992, NASA announced that an experienced cosmonaut would fly aboard the Shuttle. Titov trained as backup for Sergei Krikalev who flew in February 1994. This will be Titov's first flight aboard a Space Shuttle.

The STS-63 crew patch depicts the Orbiter maneuvering to rendezvous with the Russian Space Station Mir. The name Mir is printed in Cyrillic on the side of the station. Visible in the Orbiter payload bay are the commercial space laboratory Spacehab and the Spartan satellite which are the major payloads on the flight. The six points on the rising sun and the three stars form mission number 63. The United States and Russian flags are at the bottom of the patch.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Team Member,

Laser technology has been around for decades, but on STS-64 the astronaut crew tested a laser based system which should be of tremendous benefits to all mankind. The Lidar In-Space Technology Experiment (LITE) was the first ever in space technology test of a light detection and ranging (LITE) laser based system. Data generated should help explain the impact of human activity on the atmosphere and give us crucial information about our climate.

We can all be very proud of the role we have played in making this vital scientific research possible. Other research projects, including some very exciting "untethered" space walks, rounded out the STS-64 schedule of activity.

Thanks to all for an excellent job of processing Discovery for this important mission.

Sincerely,

Gerry T. Oppliger
President

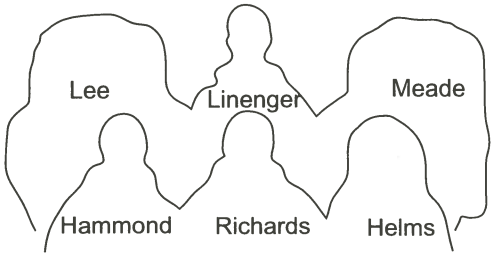
National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-64

National Aeronautics and Space Administration

JSCCL-139

The Crew of Space Shuttle Mission STS-64



Commander
Richard N. Richards (Captain,USN)
Richard Richards was born in Key West, Florida, but considers St. Louis, Missouri, his hometown. He earned a bachelor of science degree in chemical engineering from the University of Missouri and a master of science degree in aeronautical systems from the University of West Florida. After graduating from the University of Missouri, Richards became a naval aviator flying the A-4 Skyhawk and F-4 Phantom. Following graduation from the U.S. Naval Test Pilot School at Patuxent River, Maryland, he flew numerous test projects in the A-7, F-4, and F\A-18A Hornet airplanes. He made the first F\A-18 catapults and arrested landings aboard the USS America. Richards has logged more than 5,000 hours flying time and completed more than 400 aircraft carrier landings. He became an astronaut in 1981 and has flown three times in space. Richards served as pilot of the STS-28 mission and commander of the STS-41 and STS-50 missions. This will be his fourth space flight.

Pilot
L. Blaine Hammond, Jr. (Colonel, USAF)
Blaine Hammond was born in Savannah, Georgia, but considers St. Louis, Missouri, his home. Hammond received a bachelor of science degree in engineering science and mechanics from the U.S. Air Force Academy and a master of science degree in engineering science and mechanics from Georgia Institute of Technology. He served in Germany flying the F-4E with the 50th Tactical Fighter Wing, 496th Tactical Fighter Squadron, and became an instructor pilot in the F-5B/E/F at Williams Air Force Base in Arizona. Following his graduation in 1981 from the Empire Test Pilot School at Boscombe Down, U.K., Hammond managed several test projects at Edwards AFB and later was an instructor at the U.S. Air Force Test Pilot School. He has logged over 4,300 flying hours in 15 American and 10 Royal Air Force aircraft. Hammond was selected to become a pilot astronaut in 1984 where he has specialized in areas such as Shuttle cockpit flight displays and software. Hammond was the pilot on the STS-39 mission in 1991. This will be his second space flight.

Mission Specialist
Mark C. Lee (Colonel, USAF)
Mark C. Lee was born in Viroqua, Wisconsin. He earned a bachelor of science degree in civil engineering from the U.S. Air Force Academy and a master of science degree in mechanical engineering from the Massachusetts Institute of Technology. While assigned to Hanscom Air Force Base, Massachusetts, his responsibilities included resolving mechanical and material defects which affected the mission readiness of the Airborne Warning and Control System aircraft. Lee flew F-16's while serving as executive officer for the 388th Tactical Fighter Wing, Deputy Commander for Operations, and as flight commander in the 4th Tactical Fighter Squadron at Hill Air Force Base, Utah. He has logged 3,500 hours flying time, mostly in the T-38, F-4 and F-16 aircraft. Selected as an astronaut in 1984, Lee was a mission specialist aboard STS-30 and STS-47. This will be his third space flight.

Mission Specialist
Carl J. Meade (Colonel, USAF)
Carl Meade was born at Chanute Air Force Base, Illinois. He earned a bachelor of science degree in electronics engineering from the University of Texas and a master of science degree in electronics engineering from the California Institute of Technology. Upon graduation from the U.S. Air Force Test Pilot School, Meade was assigned to the 6510th Test Wing at Edwards Air Force Base in California. While there, he conducted aircraft performance and weapons systems tests of the F-4E, F-5E, RF-5E, F-16A and C, and F-20 fighter aircraft. He has logged over 4,400 hours of jet time in 27 different aircraft. He was selected by NASA to be an astronaut in 1985. Meade served as a mission specialist on the STS-38 and STS-50 missions.This will be his third space flight.

Mission Specialist
Susan J. Helms (Lt. Colonel, USAF)
Susan Helms was born in Charlotte, North Carolina, but calls Portland, Oregon, her hometown. She earned a bachelor of science degree in aeronautical engineering from the U.S. Air Force Academy and a master of science degree in aeronautics/astronautics from Stanford University. While at Eglin Air Force Base, Florida, she was an F-16 weapons separation engineer and later lead engineer for F-15 weapons separation. She subsequently was assigned to the faculty of the U.S. Air Force Academy where she held the position of assistant professor. Helms served as a U.S. Air Force exchange officer to the Aerospace Engineering Test Establishment, Canadian Forces Base, Cold Lake, Alberta, Canada, working as a flight test engineer and project officer on CF-18 aircraft. She has flown in 30 different types of U.S. and Canadian aircraft. Helms was named an astronaut in 1990 and flew as a mission specialist on STS-54. This will be her second space flight.

Mission Specialist
Jerry M. Linenger, M.D, M.S.S.M, M.P.H., Ph.D (Commander, USN)
Jerry Linenger was born in Mt. Clemens, Michigan, but considers Eastpointe, Michigan, and Coronado, California, to be his hometowns. He earned a bachelor of science degree in bioscience from the U.S. Naval Academy, a doctorate in medicine from Wayne State University, a master of science degree in systems management, a master of public health degree, and a doctor of philosophy degree in epidemiology from the University of North Carolina. After completing surgical internship training at Balboa Naval Hospital, San Diego, California, Linenger served as a naval flight surgeon at Cubi Point, Republic of the Philippines. He was then assigned as medical advisor to the Commander, Naval Air Forces, U.S. Pacific Fleet, San Diego. He later became a research principal investigator at the Naval Health Research Center and a faculty member at the University of California-San Diego School of Medicine in the Division of Sports Medicine. Linenger was selected to be an astronaut in 1992. This will be his first space flight.

STS-64 Insignia
The mission insignia depicts the Space Shuttle Discovery with its primary payload, Lidar-In Space Technology Experiment, aimed towards Earth. Three gold laser beams emanate from the instrument to form part of the astronaut symbol. In addition to gathering information about Earth's troposphere and stratosphere, the mission will deploy the SPARTAN-201 satellite, shown on the remote manipulator system arm and will feature a space walk to test new EVA rescue equipment. Crew member names circle the patch and colored stars represent their branch of military service.

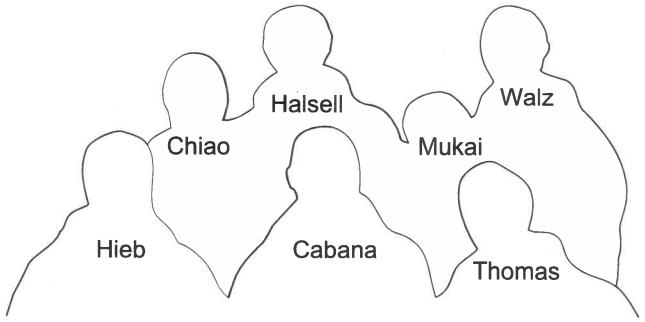
National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-65

National Aeronautics and Space Administration

JSCCL-138

The Crew of Space Shuttle Mission STS-65



Commander
Robert D. Cabana (Col., USMC)
Robert Cabana was born and raised in Minneapolis, Minnesota. He received a bachelor of science degree in mathematics from the U. S. Naval Academy in Annapolis, Maryland. After graduation, he was commissioned in the United States Marine Corps and earned his wings as a Naval flight officer and a Naval aviator flying the A-6 Intruder with the Ist and 2nd Marine Aircraft Wings. Following his graduation from U. S. Naval Test Pilot School in Patuxent River, Maryland, he flew numerous ordnance and flight system test projects in the A-4 and A-6 airplanes and participated in development of the flight control system for the X-29 flight technology demonstrator. He has logged over 4,900 hours flying time. Cabana was selected to be an astronaut in 1985 and was pilot on STS-41 and STS-53.

Pilot
James D. Halsell, Jr. (LTC, USAF)
Jim Halsell was born in Monroe, Louisiana. He earned a bachelor of science degree in engineering from the United States Air Force Academy, a master of science degree in management from Troy University, and a master of science degree in space operations from the Air Force Institute of Technology. Following his graduation from the Air Force Academy, Halsell trained as a pilot and served as an F-4D aircraft commander. He later became a squadron flight lead, instructor pilot, strike package commander and Chief of the Squadron Standardization/ Evaluation Branch at Moody Air Force Base. Halsell then served as an Air Force test pilot in the F-4, F-16, and SR-71 aircraft. NASA selected Halsell to become an astronaut in 1990. This will be his first space flight.

Payload Commander
Richard J. Hieb
Richard Hieb was born in Jamestown, North Dakota. He received a bachelor of arts degree in mathematics and physics from Northwest Nazarene College and a master of science degree in aerospace engineering from the University of Colorado. Following graduation, he joined NASA and worked in many different areas of flight operations, including crew development and spacecraft rendezvous procedures. Hieb became an astronaut in 1985, and flew as a mission specialist aboard STS-39 and STS-49. On STS-65, he will serve as payload commander.

Mission Specialist
Leroy Chiao (Ph.D,)
Leroy Chiao was born in Milwaukee, Wisconsin, but considers Danville, California, to be his home town. Chiao received a bachelor of science degree in chemical engineering from the University of California, Berkeley, and a master of science degree and a doctorate in chemical engineering from the University of California, Santa Barbara. After receiving his doctorate degree, Chiao began working for Hexcel Corporation on process engineering research on advanced aerospace materials. Dr. Chiao joined Lawrence Livermore National Laboratory to work on processing research for fabrication of aerospace composites. In 1990, Dr. Chiao was selected by NASA to become an astronaut. This will be his first space flight.

Mission Specialist
Donald A. Thomas (Ph.D.)
Donald Thomas was born in Cleveland, Ohio. He received a bachelor of science degree in physics from Case Western Reserve University and master of science and doctorate degrees in materials science from Cornell University. Upon graduation, Dr. Thomas joined AT&T Bell Laboratories as a senior member of the technical staff. He also worked as an adjunct professor in the Department of Physics at Trenton State College. Dr. Thomas later joined Lockheed Engineering and Sciences Company to review materials used in Space Shuttle payloads. He then became a materials engineer at NASA's Johnson Space Center and worked on advanced composite materials for use on Space Station and was a principal investigator for a microgravity crystal growing experiment that flew on STS-32. NASA selected Dr. Thomas to be an astronaut in 1990. This will be his first space flight.

Mission Specialist
Carl E. Walz (Major, USAF)
Carl Walz was born in Cleveland, Ohio. He received a bachelor of science degree in physics from Kent State University and a master of science degree in solid state physics from John Carroll University. While stationed at McClellan Air Force Base in California, he worked as a radiochemical project officer, responsible for analysis of radioactive samples from the Atomic Energy Detection System. As a flight test engineer at the F-16 Combined Test Force, Edwards Air Force Base, he worked on F-16C avionics and armament development programs, flying F-4 and F-16 aircraft. He also served as a flight test program manager at Detachment 3, Air Force Flight Test Center. Walz was selected by NASA to become an astronaut in 1990 and flew as a mission specialist on STS-51.

Payload Specialist
Chiaki Naito-Mukai (M.D., Ph.D.)
Chiaki Naito-Mukai was born in Tatebayashi, Gunma Prefecture, Japan. She received a doctor of medicine degree and a doctorate in physiology from Keio University School of Medicine. Dr. Mukai has worked as a resident in general surgery at Keio University Hospital. She has also been a part of the medical staffs in general surgery of Shimizu General Hospital and emergency surgery at Saiseikai Kangawa Hospital. She later became a resident in cardiovascular surgery at Keio University Hospital and has served on the medical staff in cardiovascular surgery at the Saiseikai Utsunomiya Hospital. Dr. Mukai later returned to Keio University Hospital as the chief resident in cardiovascular surgery and later was promoted to assistant professor of the Department of Cardiovascular Surgery, Keio University. In 1985, Dr. Mukai was selected by the National Space Development Agency of Japan (NASDA) as one of three Japanese payload specialists candidates for the STS-47 flight. As a NASDA astronaut, she became a visiting scientist at the Division of Cardiovascular Physiology, Space Biomedical Research Institute at the Johnson Space Center. She is also a research instructor of the Department of Surgery at Baylor College of Medicine, Houston, TX. STS-65 will be her first space flight.

STS-65 Crew Insignia

STS-65 is a Spacelab flight aboard the Space Shuttle Columbia and is the second International Microgravity Laboratory mission (IML-2), reflected in the emblem by two gold stars shooting toward the heavens behind the IML lettering. The Space Shuttle Columbia is depicted orbiting the logo and reaching off into space, with the Spacelab in the payload bay on an international quest for a better understanding of the effects of space flight on materials and life sciences.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

November 18, 1994

Dear Team Member,

Our final launch of 1994 - the STS-66 mission on November 3 - was one of the best ever! After a very smooth processing flow, Atlantis was 100% ready for its great, on schedule lift-off.

After the launch, NASA officials had high praise for the superb work of the Shuttle Processing Team and I'd like to add my own congratulations and thanks to all for a tough job very well done.

With our 1994 launch schedule now completed, we can focus on processing STS-63 and STS-67 for their missions early in 1995 and continuing to "fine tune" our processing procedures.

I'd also like to extend to you and your family my best wishes for a meaningful and rewarding Thanksgiving holiday.

Sincerely,

Gerry Oppliger
President

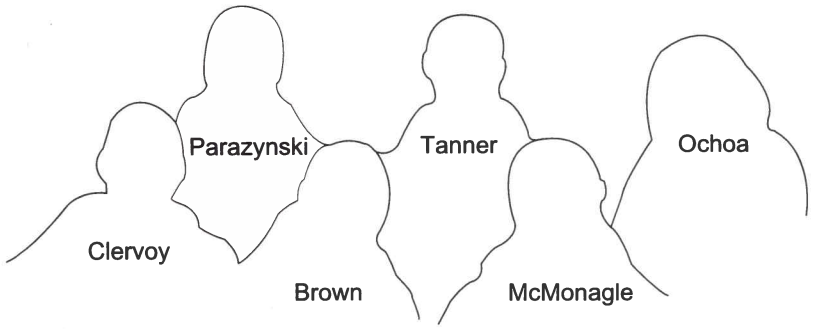
National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-66

National Aeronautics and Space Administration

JSCCL-140

The Crew of Space Shuttle Mission STS-66



Commander
Donald R. McMonagle (Lt. Col., USAF)
Donald McMonagle was born in Flint, Michigan. He earned a bachelor of science degree in astronautical engineering from the U.S. Air Force Academy and a master of science degree in mechanical engineering from California State University-Fresno. He served as an F-4 pilot at Kunsan Air Base, South Korea, before assignment to Holloman Air Force Base, New Mexico, where he flew F-15s. He was the operations officer and project test pilot for the Advanced Fighter Technology Demonstration F-16 aircraft while stationed at Edwards Air Force Base, California. McMonagle has over 4,200 hours of flying time in several aircraft, primarily the T-38, F-4, F-15, and F-16. He was named an astronaut in 1987, and flew as a mission specialist aboard STS-39 and as pilot of STS-54.

Pilot
Curtis L. Brown, Jr. (Lt. Col., USAF)
Curtis L. Brown was born in Elizabethtown, North Carolina. He received a bachelor of science degree in electrical engineering from the U.S. Air Force Academy. He flew A-10 aircraft at Myrtle Beach Air Force Base (AFB), South Carolina, before being reassigned to Davis-Monthan AFB, Arizona, as an A-10 instructor pilot. While an instructor pilot, he attended the USAF Fighter Weapons School and the USAF Test Pilot School. Upon graduation, he served as a test pilot in the A-10 and F-16 aircraft at Eglin AFB, Florida. Brown has logged over 4,000 hours flight time in jet aircraft. His technical assignments to date include: development of the Flight Data File, lead of the Astronaut Launch Support Team responsible for crew ingress and strap-in prior to launch and crew egress after landing, and lead CAPCOM (spacecraft communicator). Brown was selected as an astronaut in 1987 and flew as pilot of STS-47.

Payload Commander
Ellen Ochoa (Ph.D.)
Ellen Ochoa was born in Los Angeles, California, but considers La Mesa, California, to be her hometown. She received a bachelor of science degree in physics from San Diego State University and master of science and doctorate degrees in electrical engineering from Stanford University. Her doctoral dissertation on photorefractive crystals resulted in a patent for a system to detect defects in periodic objects. She is also co-inventor on two additional patents in the field of optics. After joining NASA Ames Research Center, she was selected as Chief of the Intelligent Systems Technology Branch, serving as technical and administrative head of 35 engineers and scientists researching and developing computational systems for aerospace missions. Ochoa was named an astronaut in 1990 and flew as a mission specialist aboard STS-56.

Mission Specialist
Joseph R. Tanner
Joe Tanner was born in Danville, Illinois. After graduating from the University of Illinois with a degree in mechanical engineering, Tanner joined the U.S. Navy and earned his pilot wings. He served as an A-7E pilot with Light Attack Squadron 94 aboard the U.S.S. Coral Sea. He also served as an advanced jet instructor pilot and later flew the A-7 with the Navy Reserves. Tanner joined the NASA Johnson Space Center in 1984 as an aeronautical engineer and research pilot. He instructed astronaut pilots on Shuttle landing techniques in the Shuttle Training Aircraft and was Deputy Chief of the Aircraft Operations Division. He has logged over 7,000 hours in military and NASA aircraft. Tanner was selected to be an astronaut in 1992. This will be his first space flight.

Mission Specialist
Jean-François Clervoy (ESA Astronaut)
Jean-François Clervoy was born in Longeville-les Metz, France, but considers Toulouse, France, to be his hometown. He graduated from Ecole Polytechnique, Paris, in 1981; from Ecole Nationale Supérieure de l'Aéronautique et de l'Espace, Toulouse, in 1983; and from Ecole du Personnel Navigant d'Essais et de Reception, Istres, as a flight test engineer, in 1987. After working on French space agency missions, including the SPOT Earth observation satellite and the comet probe VEGA, Clervoy was selected in the second group of French astronauts in 1985. Before being accepted as a European Space Agency (ESA) astronaut in 1992 and reporting to the NASA Johnson Space Center for astronaut training, Clervoy was the Chief Test Director of the Parabolic Flight Program and provided support to the European Manned Space Programs. Clervoy has also received training on the Russian Space Systems at Star City, Moscow. This will be his first space flight.

Mission Specialist
Scott E. Parazynski (M.D.)
Scott Parazynski was born in Little Rock, Arkansas, but considers Palo Alto, California, and Evergreen, Colorado, to be his hometowns. Parazynski earned a bachelor of science degree in biology from Stanford University and a doctorate of medicine from Stanford Medical School. He served his internship at the Brigham and Women's Hospital of Harvard Medical School and was a resident physician in emergency medicine when he was selected as a NASA astronaut in 1992. He has conducted extensive research on fluid shifts that occur during human space flight and has been involved in the design of several exercise devices that are being developed for long-duration space flight. Parazynski has particular expertise in human adaptation to stressful environments including the study of high altitude acclimatization. This will be his first space flight.

STS-66 Crew Emblem

The STS-66 emblem depicts the Space Shuttle *Atlantis* launching into Earth orbit to study global environmental change. The ATLAS-3 payload (Atmospheric Laboratory for Applications and Science) and complementary experiments are part of a continuing study of our atmosphere and the sun's influence on it. The Shuttle is trailed by gold plumes representing the astronaut symbol and is superimposed over the Earth, much of which is visible from the flight's high inclination orbit. Sensitive instruments aboard the ATLAS pallet in the Shuttle payload bay and on the free-flying CRISTA-SPAS (Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-Shuttle Pallet Satellite) will gaze down on Earth and towards the sun, illustrated by the stylized sunrise and visible spectrum. This emblem was designed by the STS-66 crew.

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

March 24, 1995

Dear Team Member,

The night launch of Endeavour on STS-67 was not only one of the most beautiful of our Shuttle launches, it culminated one of our smoothest flows and countdowns.

As is often the case, our processing team had to deal with some problems during the flow, but when that launch window opened at 1:37 a.m. on the second of March, we were ready to go and Mission Commander Steve Oswald and his astronaut crew took Endeavour into orbit right on schedule.

This record setting mission - in orbit for 16 days - was the longest ever Space Shuttle mission and all of us can be proud of being a part of this milestone achievement.

Keep up the great work!

Sincerely,

Gerry Oppliger
President

Lockheed Space Operations Company
1100 Lockheed Way
Titusville, Florida 32780

Dear Teammember,

After an unusually smooth countdown, Endeavour lifted off on its STS-68 mission right on time at 7:16 a.m.on September 30th.

Obviously, all of us would have preferred to have launched this mission on its originally scheduled date of August 18th but, at T-minus 1.9 seconds, a sensor indicated an over-heated oxidizer pump and the mission was aborted. All our SPC personnel performed their flight hardware safing and recovery operations flawlessly and we again demonstrated that the safety of our astronaut crew and the flight hardware are absolutely our first concern and responsibility.

STS mission commander Mike Baker and his crew conducted a number of Space Radar Laboratory experiments which yielded valuable research data on how the Earth's environment is changing.

Six up and one to go! So far this year we've successfully launched six Shuttles and we have only one mission left on the 1994 manifest.

Let's bear down and make our last mission of the year - Atlantis on STS-66 - the best of the year.

Sincerely,

Gerry Oppliger
President

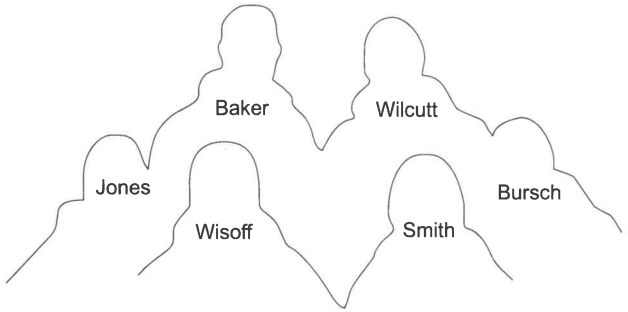
National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-68

National Aeronautics and
Space Administration

JSCCL-137

The Crew of Space Shuttle Mission STS-68



Commander
Michael A. Baker (Capt., USN)
Michael Baker was born in Memphis, Tennessee, but considers Lemoore, California, to be his hometown. He received a bachelor of science degree in aerospace engineering from the University of Texas. After completing flight training, he flew the A-7E aircraft aboard the USS Midway. He conducted A-7 aircraft-related tests on the various aircraft carriers in the Navy's fleet. Baker served as an instructor at the U.S. Naval Test Pilot School before assignment as the U.S. Navy Exchange Instructor at the Empire Test Pilots' School in Boscombe Down, England. He has logged over 4,200 hours flying time in some 50 different types of aircraft, and has completed over 300 carrier landings. He was named an astronaut in 1985, and was pilot of the STS-43 and STS-52 missions.

Pilot
Terrence W. Wilcutt (Maj., USMC)
Terrence Wilcutt was born in Russellville, Kentucky. He graduated with a bachelor of arts degree in mathematics from Western Kentucky University. Upon graduation, Wilcutt taught high school math for two years and then entered the U.S. Marine Corps. He earned his wings in 1978 and served on various assignments in Hawaii and overseas in aircraft such as the F-4 Phantom, F/A Hornet, and the A-7 Corsair II. Wilcutt attended the Naval Fighter Weapons School (Topgun) and the U.S. Naval Test Pilot School. He has over 3,000 flight hours in more than 30 different kinds of aircraft. Wilcutt was selected as an astronaut in 1990 and has served in a variety of responsibilities including Space Shuttle main engine and external tank issues and launch support. This will be his first space flight.

Payload Commander
Thomas D. Jones (Ph.D.)
Thomas David Jones was born in Baltimore, Maryland. He earned a bachelor of science degree in basic sciences from the U. S. Air Force Academy and a Ph.D. in planetary sciences from the University of Arizona. As an Air Force officer, he served as a B-52 strategic bomber pilot and aircraft commander, accumulating over 2,000 hours of flight experience. After leaving the Air Force, Jones worked toward his doctorate, using remote sensing to investigate the composition of asteroids and meteorites, and researching the utility of asteroid resources in space exploration. He was a program management engineer for the CIA's Office of Development and Engineering and later a senior scientist at Science Applications International Corporation, analyzing future missions to Mars, asteroids, and the outer solar system. He was selected as an astronaut by NASA in 1990. Jones flew in space on the STS-59 mission; this will be his second flight on Endeavour.

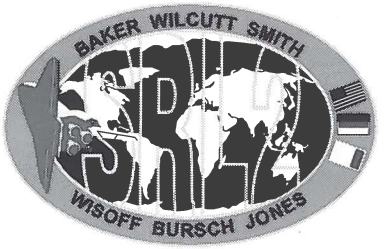
Mission Specialist
Steven L. Smith
Steven Smith was born in Phoenix, Arizona, but considers San Jose, California, to be his hometown. Smith received a bachelor of science degree in electrical engineering, master of science degree in electrical engineering, and a master's degree in business administration, all from Stanford University. He worked for IBM in the Large Scale Integration (semiconductor) Technology Group as a technical group lead. Smith joined NASA in 1989 in the Payload Operation Branch, Mission Operations Directorate. As a payload officer, his duties included payload integration and mission support. He was selected as an astronaut in 1992 and has provided Space Shuttle support in the areas of main engines, solid rocket boosters, and the external tank. This will be his first space flight.

Mission Specialist
Peter J. K. "Jeff" Wisoff (Ph.D.)
Peter J. K. Wisoff was born in Norfolk, Virginia. He received a bachelor of science degree in physics from the University of Virginia and a master of science degree and doctorate in applied physics from Stanford University. Upon graduation, he joined the faculty of Rice University in the Department of Electrical and Computer Engineering. His research focused on the development of new vacuum ultraviolet and high intensity laser sources. He also worked with researchers from regional Texas medical centers on the use of lasers in rebuilding damaged nerves. Wisoff has contributed numerous papers at technical conferences and in journals in the areas of lasers and laser applications. He was named an astronaut in 1990 and was a mission specialist aboard STS-57.

Mission Specialist
Daniel W. Bursch (Cdr., USN)
Daniel Bursch was born in Bristol, Pennsylvania, but considers Vestal, New York, his hometown. He earned a bachelor of science degree in physics from the U.S. Naval Academy, and a master of science degree in engineering science from the Naval Postgraduate School. After training as an A-6E Intruder bombardier/navigator, he served aboard the USS John F. Kennedy and USS America. After working as a project test flight officer for the A-6 Intruder, he served as a flight instructor at the U.S. Naval Test Pilot School. Bursch worked as Strike Operations Officer for Commander, Cruiser-Destroyer Group 1, making deployments to the Indian Ocean aboard the USS Long Beach and USS Midway. He has over 2,100 flight hours in more than 35 different aircraft. Bursch was selected as an astronaut in 1990 and flew as a mission specialist aboard STS-51.

STS-68 CREW PATCH DESCRIPTION

Exploration of the Earth from space is the focus of the design of the patch for STS-68, the second flight of the Space Radar Laboratory (SRL-2), part of NASA's "Mission to Planet Earth."- The world's landmasses and oceans dominate the center field, with the Space Shuttle Endeavour circling the globe. The SRL-2 letters span the width and breadth of the planet Earth, symbolizing worldwide coverage of the two prime experiments of STS-68: the SIR-C/X-SAR (Shuttle Imaging Radar-C and X-Band Synthetic Aperture Radar) instruments, and the Measurement of Air Pollution from Satellites (MAPS) sensor. The red, blue, and black colors of the emblem represent the three operating wavelengths of SIR-C/X-SAR, and the gold band surrounding the globe symbolizes the atmospheric envelope examined by MAPS. The flags of the SRL international partners, Germany and Italy, are shown opposite Endeavour. The relationship of the Orbiter Endeavour to Earth highlights the usefulness of human space flight in understanding Earth's environment, and monitoring its changing surface and atmosphere. The soaring Orbiter also typifies the excellence of the NASA team in exploring our own world, using the tools the Space Program developed to explore the other planets in the solar system.



Lockheed Martin Space Operations
1100 Lockheed Way Titusville, FL 32780
Telephone 407·867·3666 Facsimile 407·867·3859

LOCKHEED MARTIN

G.T. Oppliger
President

September 22, 1995

Dear Team Member,

Congratulations to you and your SPC colleagues for yet another great job of Shuttle processing. On the STS-69 mission, the astronaut crew deployed and later retrieved two free-flying payloads - a "first" in the Space Shuttle Flight Program.

For these intricate operations to succeed, the crew had to have an orbiter which performed flawlessly and that's just what our team gave them. Endeavour was ready and met all the challenges of this difficult mission.

Also, during this flight, Mission Specialists Voss and Gernhardt performed a space walk to prepare for the future assembly and maintenance of the International Space Station.

Thanks to all for the good work!

Sincerely,

Gerry Oppliger

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-69

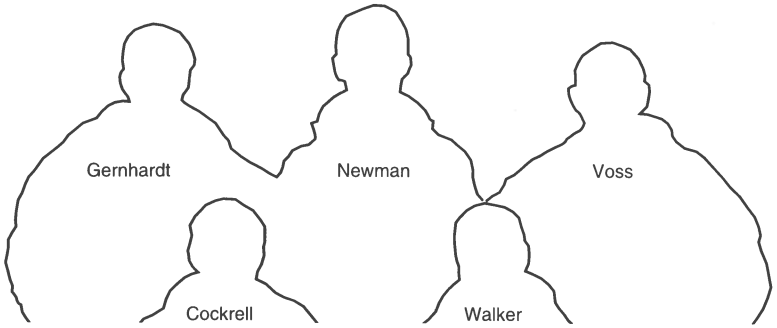
National Aeronautics and Space Administration

JSCCL-145

The Crew of Space Shuttle Mission STS-69

Commander
David M. Walker (Captain, USN)
David Walker was born in Columbus, Georgia, but considers Eustis, Florida, his hometown. He graduated from the U.S. Naval Academy in 1966, and received his Naval Aviator Wings in 1967. After two combat cruises aboard the USS Enterprise and USS America flying F-4 Phantoms, in 1971 Walker attended the United States Air Force Aerospace Research Pilot School at Edwards Air Force Base, California. From 1972 through 1975, he was assigned to the Naval Air Test Center in Patuxent River, Maryland, as an experimental test pilot, then returned to the fighter community in F-14 Tomcats for two Mediterranean cruises prior to selection by NASA to the 1978 astronaut class. He has logged over 7,000 flying hours in more than 40 different types of aircraft. Walker was pilot of STS-51A and commander of STS-30 and STS-53. With the completion of his last Shuttle mission, he has spent approximately 464 hours in space.

Pilot
Kenneth D. Cockrell
Kenneth Cockrell was born in Austin, Texas. He received a bachelor of science degree in mechanical engineering from the University of Texas and a master of science degree in aeronautical systems from the University of West Florida. After designation as a Naval Aviator, he flew the A-7 Corsair II aboard the USS Midway in the western Pacific and Indian Oceans. Following graduation from the U.S. Naval Test Pilot School in Maryland, he conducted flight tests on the A-4, A-7, F-4, and F/A-18 aircraft. He was assigned as a pilot in an operational F/A-18 squadron and made two cruises on the USS Constellation. He logged over 5,900 flying hours and 650 carrier landings. Cockrell resigned his commission to work as a research pilot at NASA's Johnson Space Center. Selected as a pilot astronaut in 1990, Cockrell was the flight engineer and orbit pilot for STS-56. He logged 222 hours in space.



Mission Specialist
Michael L. Gernhardt, Ph.D.
Born in Mansfield, Ohio, Michael Gernhardt earned a bachelor of science degree in physics from Vanderbilt University, and a master of science degree and doctorate in bioengineering from the University of Pennsylvania. While at the University of Pennsylvania, Gernhardt developed a new theoretical decompression model based on tissue-gas bubble dynamics and simultaneously worked as a professional deep-sea diver and project engineer on a variety of subsea oil field construction and repair projects around the world. He was involved with the development of a telerobotic system for subsea-platform cleaning and inspection as well as a variety of new diver and robot tools at Oceaneering International, and subsequently founded Oceaneering Space Systems. Prior to his selection by NASA as an astronaut, Gernhardt worked on the development of new astronaut and robot-compatible tools for performing maintenance on the Space Station. He also worked on the development of new portable life-support systems and decompression procedures for spacewalks. Gernhardt has been involved in a variety of technical areas at NASA, including the development of nitrox diving to support astronaut training. STS-69 is Gernhardt's first Space Shuttle mission.

Mission Specialist
James H. Newman, Ph.D.
James Newman was born in the Trust Territory of the Pacific Islands, but grew up in San Diego, California. He received a bachelor of arts degree in physics from Dartmouth College, a master of arts and doctoral degrees in physics from Rice University. He holds an appointment as an adjunct professor in the Department of Space Physics and Astronomy at Rice University, with research interests in atomic and molecular physics. While working at NASA Johnson Space Center before becoming an astronaut, his responsibilities included conducting flight crew and flight-control team training for all Shuttle mission phases in the areas of orbital propulsion, guidance, and control. Newman was selected as an astronaut in 1990. He was a mission specialist aboard STS-51 and has logged approximately 236 hours of space flight, including a seven-hour spacewalk.

Payload Commander
James S. Voss (Colonel, USA)
Jim Voss was born in Cordova, Alabama, and grew up in Opelika, Alabama. He earned a bachelor of science degree in aerospace engineering from Auburn University and a master of science degree in aerospace engineering sciences form the University of Colorado. After completing airborne and ranger training, Voss served as an infantry platoon leader, intelligence staff officer, and company commander in Germany, then taught in the Department of Mechanics at West Point. He graduated from the U.S. Naval Test Pilot School and served as an Army flight test engineer. At NASA, Voss worked as a vehicle integration test engineer before becoming an astronaut in 1987. He flew as a mission specialist on board STS-44 and STS-53. With his two Shuttle flights, Voss has spent more than 340 hours in space.

STS-69 Crew Emblem

The STS-69 crew patch symbolizes the multifaceted nature of this mission. The primary payload, the Wake Shield Facility, is represented in the center of the patch by the astronaut emblem against a flat disk. The astronaut emblem also signifies the importance of humans in space exploration, reflected by the planned spacewalk supporting Space Station assembly.

The two stylized Shuttles highlight the ascent and entry phases of the mission and, along with the two spiral plumes, symbolize a NASA first: the deployment and recovery on the same mission of two spacecraft, Wake Shield and Spartan.

The constellations Canis Major and Canis Minor represent the astronomy objectives of the Spartan and International Extreme Ultraviolet Hitchhiker (IEH) payload and symbolize the talents and dedication of the support personnel who make Space Shuttle missions possible.

Lockheed Martin Space Operations
1100 Lockheed Way Titusville, FL 32780
Telephone 407·867·3666 Facsimile 407·867·3859

LOCKHEED MARTIN

G.T. Oppliger
President

July 28, 1995

Dear SPC Team Member,

With the on time July 13 launch of Discovery on STS-70, our SPC Team really showed that it could respond to an unusually demanding and time constrained Shuttle recovery--launch sequence. Just six days before the STS-70 launch, we had worked landing and recovery operations when Atlantis returned from its STS-71 mission. Our SPC Team -- and in fact, the entire KSC Shuttle team -- performed extraordinarily well on both the STS-71 landing and the STS-70 launch and accomplished both operations in a record setting six days.

The bottom line is that we demonstrated to the world that we have tremendous capabilities and great flexibility. We prove, over and over again, that we can take on demanding assignments and turn in an outstanding performance.

Keep up the good work!

Sincerely,

Gerry Oppliger

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-70

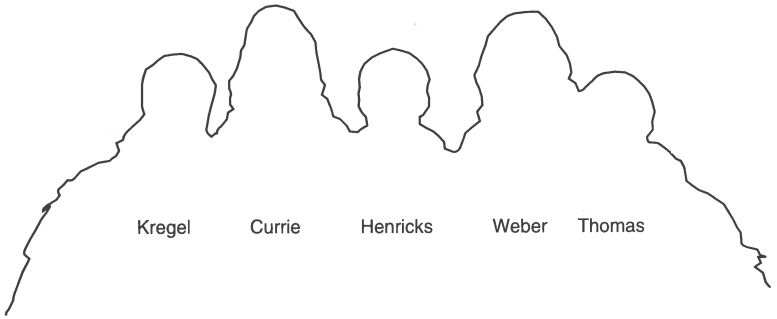
National Aeronautics and Space Administration

JSCCL-144

The Crew of Space Shuttle Mission STS-70

Commander
Terence T. Henricks (Col., USAF)
Tom Henricks was born in Bryan and grew up in Woodville, Ohio. He received a bachelor of science degree in civil engineering from the United States Air Force Academy in 1974 and a master's degree in public administration from Golden Gate University in 1982. Upon graduation from the Air Force Academy, Henricks completed pilot training and flew F-4 fighter aircraft in England, Iceland, and the U.S. He is a graduate of the Air Force's Fighter Weapons and Test Pilot Schools. He was an F-16C test pilot prior to his selection as a NASA astronaut in 1985. He has logged 747 parachute jumps and over 4,700 hours flying time. Henricks served as the pilot on Space Shuttle Missions STS-44 and STS-55.

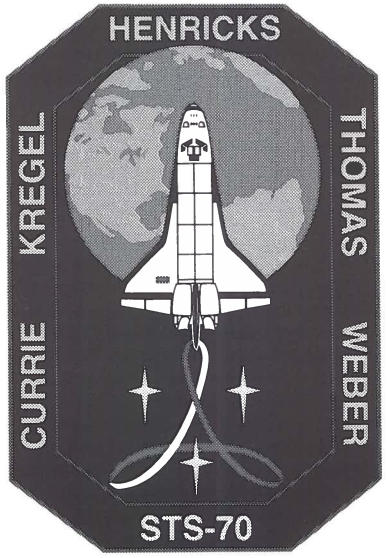
Pilot
Kevin R. Kregel
Kevin Kregel was born in New York City and raised in Amityville, New York. He is a graduate of the United States Air Force Academy from which he received a bachelor of science degree in astronautical engineering. Kregel spent 12 years in the Air Force as a fighter pilot and test pilot. He has operational tours in the F-111 at Royal Air Force Lakenheath, England, and in the A6-E on an exchange tour with the Navy at the Naval Air Station Whidbey Island. Kregel made a Western Pacific deployment aboard the U.S.S. Kittyhawk and completed 66 carrier landings. He attended the United States Naval Test Pilot School after which he was assigned to Eglin Air Force Base, Florida, to flight-test F-111 and F-15 aircraft. A former NASA aerospace engineer and Shuttle-training instructor pilot, Kregel has logged over 4,400 flight hours in 30 different aircraft. His previous NASA assignment was lead astronaut support pilot of Shuttle launches and landings at the Kennedy Space Center, Florida. Mission STS-70 is Kregel's first space flight.



Mission Specialist
Nancy J. Currie (Capt., USA)
Astronaut-scientist Nancy J. Currie was born in Wilmington, Delaware, and raised in Troy, Ohio. She received a bachelor of arts degree with honors in biological science from Ohio State University and a master of science degree in safety engineering from the University of Southern California. A captain in the U.S. Army, Currie has served in a variety of leadership positions including helicopter-instructor pilot, section leader, platoon leader, and brigade flight-standardization officer for all phases of rotary-wing flight (including combat skills and night-vision goggle operations). As a senior Army aviator, Currie has logged over 3,000 flying hours in a variety of rotary-wing and fixed-wing aircraft. She previously flew on Mission STS-57 in which she accumulated 239 hours in space during 155 orbits around Earth.

Mission Specialist
Donald A. Thomas, Ph.D.
Donald Thomas was born in Cleveland, Ohio. He received a bachelor of science degree in physics from Case Western Reserve University and master of science and doctoral degrees in materials science from Cornell University. Upon graduation, Dr. Thomas joined AT&T Bell Laboratories as a senior member of the technical staff. He also worked as an adjunct professor in the Department of Physics at Trenton State College. Dr. Thomas joined NASA Johnson Space Center in 1988 and worked as a materials engineer until being selected as an astronaut in 1990. He served as the science mission specialist aboard Space Shuttle Mission STS-65, the second International Microgravity Laboratory (IML-2) Spacelab mission, which flew in July 1994. During this mission, Dr. Thomas spent nearly 354 hours in space. STS-70 will be his second space flight.

Mission Specialist
Mary Ellen Weber, Ph.D.
Mary Ellen Weber was born in Cleveland and grew up in Bedford Heights, Ohio. She receive a bachelor of science degree in chemical engineering from Purdue University and later earned a doctorate in physical chemistry from the University of California, Berkeley. While at Purdue, Dr. Weber held a series of engineering internships at Ohio Edison, Delco Electronics, and 3M Corp. Her doctoral dissertation focused on applied ion-beam mass spectrometry and theoretical calculations to derive the kinetics, dynamics, and thermochemistry of single-collision ion-molecule reactions. After graduation from Berkeley, Dr. Weber began researching new techniques in microelectronics manufacturing at Texas Instruments (TI) in Dallas, Texas. She was later assigned by TI to SEMATECH (a U.S. semiconductor consortium in Austin, Texas) to develop novel high-density plasma reactors for silicon etching. This research led to a further assignment at Applied Materials and Technology in Santa Clara, California, to develop a world-class plasma etcher which went into production in 1993. STS-70 will be Dr. Weber's first Space Shuttle flight.



STS-70 Crew Emblem

The STS-70 crew patch depicts the Space Shuttle Discovery orbiting Earth in the vast blackness of space. The primary mission of deploying a NASA Tracking and Data Relay Satellite is depicted by three gold stars. They represent the triad composed of spacecraft transmitting data to Earth through the Tracking and Data Relay Satellite System. The stylized red, white, and blue ribbon represents the American goal of linking space exploration to the advancement of all humankind.

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LOCKHEED MARTIN

July 12, 1995

Dear Team Member,

Years from now, as a fully operational International Space Station serves as a "homebase" for producing astounding scientific breakthroughs, all of us in the SPC can feel a special sense of pride in the knowledge that, with the launch of STS-71, we played a key role in making the space station possible.

On the landmark STS-71 mission - the 14th for the orbiter Atlantis - the astronaut crew docked with the Russian Mir Space Station demonstrating the effectiveness of the Russian made docking mechanism for potential use on the upcoming International Space Station. This mission also showed that sustained international cooperation in space is a reality.

Thanks to all for your continued outstanding performance.

Gerry Oppliger
President

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-71

National Aeronautics and
Space Administration

JSCCL-143

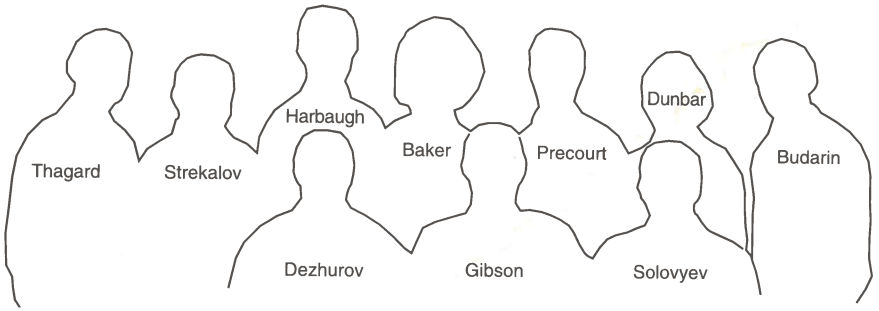
The Crew of Space Shuttle Mission STS-71

Commander
Robert L. "Hoot" Gibson (Capt. USN)
Robert L. "Hoot" Gibson first graduated with an engineering science degree from Suffolk County Community College, New York, and later earned a B.S. degree in aeronautical engineering from California Polytechnic State University. He graduated from the Naval Fighter Weapons School, "Top Gun," and subsequently served as a Navy F-14A instructor pilot. He tested and evaluated F-14A aircraft while assigned to the Naval Air Test Center's Strike Aircraft Test Directorate. With over 6,000 hours in more than 45 types of civil and military aircraft, Gibson also completed over 300 carrier landings. A veteran of four Space Shuttle flights of which he commanded three, Robert L. "Hoot" Gibson also served in a lead NASA management position as Chief of the Astronaut Office.

Pilot
Charles J. Precourt (Col., Sel., USAF)
Charles J. Precourt is a distinguished graduate of the United States Air Force Academy where he received a B.S. degree in aeronautical engineering. Fluent in French, he also attended the French Air Force Academy as an exchange student. Precourt received an M.S. degree in engineering management from Golden Gate University and an M.A. degree in national security affairs and strategic studies from the U.S. Naval War College. He then attended the U.S. Air Force Test Pilot School and flew experimental tests of the F-15E, F-4, A-7, and A-37. With over 5,000 hours in flight experience in more than 45 types of aircraft, Precourt recently completed his first Space Shuttle mission during which he served as the flight engineer mission specialist.

Payload Commander
Ellen S. Baker, M.D.
Ellen Baker received a B.S. degree in geology from the State University of New York at Buffalo and an M.D. degree from Cornell University. After completing medical school, Dr. Baker trained in internal medicine at the University of Texas Health Science Center, San Antonio, Texas. Following her residency, Dr. Baker joined NASA as a medical officer at the Johnson Space Center and, that same year, graduated from the Air Force Aerospace Medicine Primary Course at Brooks Air Force Base in San Antonio. Prior to her selection as an astronaut, Dr. Baker worked as a physician in the Flight Medicine Clinic at the Johnson Space Center. Dr. Baker has flown two Space Shuttle missions as an astronaut-scientist mission specialist and has logged more than 450 hours of space flight.

Mission Specialist
Bonnie J. Dunbar, Ph.D.
Bonnie J. Dunbar attended the University of Washington where she earned B.S. and M.S. degrees in ceramic engineering. She received a doctorate in biochemical engineering from the University of Houston where she is currently an adjunct assistant professor in mechanical engineering and serves with the Bioengineering Advisory Group. Dr. Dunbar has flown three Space Shuttle missions as an astronaut-scientist mission specialist and has logged more than 761 hours in space. Among the three missions was an international Spacelab and the first United States Microgravity Laboratory. In addition to flight aboard STS-71, Dr. Dunbar served as the backup crew member for the first flight of an American on the Russian Space Station Mir.



Mission Specialist
Gregory J. Harbaugh
Greg Harbaugh received a B.S. degree in aeronautical and astronautical engineering from Purdue University and an M.S. degree in physical science from the University of Houston. As flight engineer on STS-71, Harbaugh is responsible for assisting the crew commander and pilot during the dynamic phases of flight in addition to his work as astronaut-scientist mission specialist. Prior to being selected as an astronaut, he held numerous key positions in Shuttle flight operations. Harbaugh has worked on the Shuttle mechanical arm, telerobotics systems and extravehicular activity (EVA) development for the Space Station, and has served as the backup EVA crew member for the Hubble Space Telescope service mission. A veteran of two space flights, Harbaugh has performed one space walk of 4 hours, 28 minutes, and has logged a total of 343 hours in space.

Cosmonaut Researcher
Norman E. Thagard, M.D.
Norman E. Thagard, M.D., is a graduate of Florida State University from which he received B.S. and M.S. degrees in engineering science. He later received a doctor of medicine degree from the University of Texas Southwestern Medical School. While earning his degrees, Dr. Thagard also held a number of research and teaching positions. Prior to receiving his medical degree, Dr. Thagard entered the United States Marine Corps Reserve and later was designated a naval aviator, flying 163 combat missions in Vietnam. Dr. Thagard also pursued advanced studies in electrical engineering and has written articles on digital and analog electronic design. Dr. Thagard has flown as an astronaut-scientist mission specialist on four Space Shuttle flights and has spent 604 hours in space. In addition to STS-71, Dr. Thagard was the first American crew member aboard the Russian Space Station Mir.

Mission Commander
Vladimir N. Dezhurov
Commander of Mir, Vladimir Dezhurov earned a pilot-engineering diploma from the S. I. Gritsevits Kharkov Higher Military Aviation School and has served as a pilot and senior pilot in the Russian Air Force. He has also made 148 parachute jumps. Since 1991, he has been a correspondence student at the Yuri Gagarin Air Force Academy. Dezhurov trained as commander of the primary crew of the Mir-18 mission aboard the Soyuz-TM-21 transport vehicle as well as the Mir orbital station as part of the joint U.S. Space Shuttle and Russian Mir space ventures. He will return from Mir aboard the Space Shuttle Atlantis. Mir-18 and STS-71 are Dezhurov's first space-flight experiences.

Mission Commander
Anatoly Y. Solovyev
Anatoly Y. Solovyev graduated from the Lenin Komsomol Chernigov Higher Military Aviation School. During the STS-71 mission, Solovyev will fly aboard the Space Shuttle Atlantis to dock with the Russian Mir and will assume command of the Russian spacecraft from Dezhurov who, in turn, will be returning to Earth with Cosmonaut Strekalov and the American crew aboard Atlantis. Solovyev has flown in space three times and has logged 377 days in space and completed six spacewalks totaling 28 hours and 24 minutes.

Flight Engineer
Gennadiy M. Strekalov
Gennadiy M. Strekalov received an engineering diploma from the N. E. Bauman Moscow Higher Technical School. Involved in experimental investigations and testing of space technology, he has distinguished himself as inventor of a series of enterprise-related products for which he has earned patents. A veteran of four space flights, Strekalov has been in Earth-orbit for 153 days. He will board the Space Shuttle Atlantis to return to Earth from the Mir Space Station.

Flight Engineer
Nikolai M. Budarin
Nikolai M. Budarin earned a mechanical engineering diploma from S. Ordvhonikidve Moscow Aviation Institute. Following graduation, he worked on a number of space-related investigations associated with positions he held at NPO Energia (now RSC Energia), a major space-hardware producer in Russia. Budarin qualified as a test cosmonaut after completing a course of general space training and passing a state examination. In addition to his work in the primary operations group for space mission control, he prepared for flight aboard the Soyuz-TM and the Mir Station. STS-71 and Mir-19 are Budarin's first space flight experiences.

STS-71 Crew Patch

The STS-71 crew patch design depicts the Orbiter Atlantis in the process of the first international docking mission of the Space Shuttle with the Russian Space Station Mir. The names of the 10 astronauts and cosmonauts who will fly aboard the Orbiter are shown along the outer border of the patch. The rising sun symbolizes the dawn of a new era of cooperation between the two countries. The vehicles Atlantis and Mir are shown in separate circles converging at the center of the emblem symbolizing the merger of the space programs of the two spacefaring nations. The flags of the United States and Russia emphasize the equal partnership of the mission. The joint program symbol at the lower center of the patch acknowledges the extensive contributions made by the Mission Control Centers of both countries.

The crew emblem was designed by aviation and space artist, Bob McCall, who also designed the crew patch for the Apollo-Soyuz project in 1975, the first international space docking mission.

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LOCKHEED MARTIN

Gerry Oppliger
President

November 7, 1995

Dear SPC Team Member,

After a series of hurricane related weather delays, we launched Columbia on its STS-73 mission on October 20.

The Shuttle was in great shape and the countdown was an exceptionally smooth one. The astronaut crew has reported that Columbia performed so well in orbit that they were actually ahead of their work schedules for most of the mission.

At 16 days, this was one of our longest Shuttle missions and we generated a tremendous amount of research data via the 18 experiments which made up the United States Microgravity Laboratory-2 (USML-2) primary payload.

Thanks to all for a job well done.

Sincerely,

Gerry

Gerry Oppliger

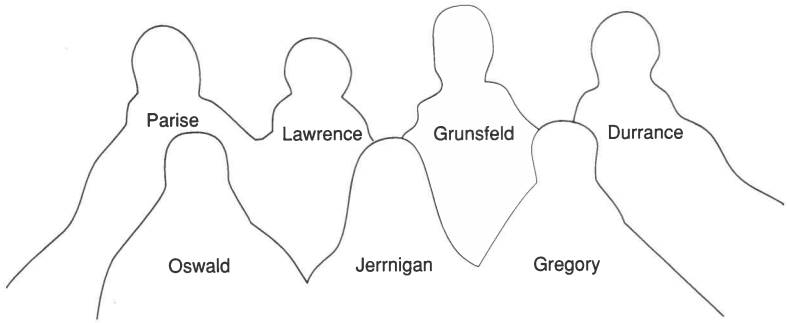
National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-67

National Aeronautics and
Space Administration

JSCCL-142

The Crew of Space Shuttle Mission STS-67



Commander
Stephen S. Oswald (Mr.)
Stephen Oswald was born in Seattle, Washington, but considers Bellingham, Washington, his hometown. He earned a bachelor of science degree in aerospace engineering from the U.S. Naval Academy in 1973 and graduated from the U.S. Naval Test Pilot School in 1978. He conducted flying qualities, performance, and propulsion flight tests on the A-7 and F/A-18 aircraft. Upon leaving active service, Oswald was a civilian test pilot for the Westinghouse Electric Corporation before joining NASA in 1984 as an aerospace engineer and instructor pilot. He has logged over 6,500 hours of flying time in over 40 different kinds of aircraft. Oswald was selected as an astronaut in 1985 and flew as pilot of STS-42 and STS-56.

Pilot
William G. Gregory (Lt. Col., USAF)
William Gregory was born in Lockport, New York. He earned a bachelor of science degree in engineering sciences from the U.S. Air Force Academy, a master of science in engineering mechanics from Columbia University and a master of science in management from Troy State University. Gregory served as a fighter pilot and an instructor pilot flying the F-111 at the Royal Air Force, Lakenheath, U.K., and U.S. Air Force, Cannon Air Force Base, New Mexico. After graduating from the U.S. Air Force Test Pilot School, he served at Edwards AFB as a test pilot flying the F-4, A-7D, and all five models of the F-15. Gregory has accumulated over 3,600 hours of flight time in over 40 types of aircraft. Gregory was selected as an astronaut in 1990. This will be his first flight.

Flight Engineer
Wendy B. Lawrence (CDR (sel), USN)
Wendy Lawrence was born in Jacksonville, Florida. She earned a bachelor of science degree in ocean engineering from the U.S. Naval Academy and a master of science in ocean engineering from the Massachusetts Institute of Technology (MIT) and the Woods Hole Oceanographic Institution. Lawrence was a distinguished flight school graduate and was designated a naval aviator in 1982. She has logged more than 1,500 hours of flight time in 6 types of helicopters and has made more than 800 shipboard landings. After graduating from MIT, Lawrence served as officer-in-charge of the Helicopter Anti-Submarine Squadron Light THIRTY Detachment Alfa. Later, she was assigned to the U.S. Naval Academy as a physics instructor and the novice women's crew coach. Lawrence was selected to be an astronaut in 1992. This will be her first space flight.

Payload Commander
Tamara E. Jernigan (Ph.D.)
Tamara Jernigan was born in Chattanooga, Tennessee. She earned a bachelor of science degree in physics (with honors), a master of science in engineering science from Stanford University, a master of science in astronomy from the University of California-Berkeley, and a doctorate in space physics and astronomy from Rice University. She worked in the Theoretical Studies Branch at NASA's Ames Research Center, conducting studies of bipolar outflows in the regions of star formation, gamma ray bursters, and shock wave phenomena in the interstellar system. Jernigan was selected to be an astronaut in 1985 and flew as a mission specialist aboard STS-40 and STS-52.

Mission Specialist
John M. Grunsfeld (Ph.D.)
John Grunsfeld was born in Chicago, Illinois. He earned a bachelor of science degree in physics from the Massachusetts Institute of Technology, a master of science and a doctorate in physics from the University of Chicago. Grunsfeld served as a visiting scientist at the University of Tokyo/Institute of Space and Astronautical Science, as a NASA graduate student fellow at the University of Chicago, as the W.D. Grainger Postdoctoral Fellow in Experimental Physics at the University of Chicago, and as a senior research fellow on the faculty of the California Institute of Technology. His research includes both X-ray and gamma ray astronomy, including a study of X-ray pulsars using the NASA Compton Gamma-Ray Observatory. Grunsfeld was selected to be an astronaut in 1992. This will be his first space flight.

Payload Specialist
Samuel T. Durrance (Ph.D.)
Samuel Durrance was born in Tallahassee, Florida, but considers Tampa, Florida, his hometown. He earned bachelor of science and master of science (with honors) degrees in physics from California State University, and a doctorate in astrogeophysics from the University of Colorado. He is a principal research scientist in the Physics and Astronomy Department at The Johns Hopkins University, is a co-investigator and assistant project scientist for the Hopkins Ultraviolet Telescope. His astronomy research focuses on the origin and evolution of planets, both in our own solar system and around other stars, and he has directed a program to develop adaptive optics instrumentation for ground-based astronomy to search for signs of planet formation around nearby stars. Durrance served as payload specialist aboard STS-35, the ASTRO-1 mission.

Payload Specialist
Ronald A. Parise (Ph.D.)
Ronald Parise was born in Warren, Ohio. He earned a bachelor of science degree in physics, with minors in mathematics, astronomy, and geology from Youngstown State University, a master of science and a doctorate in astronomy at the University of Florida. Parise is a senior scientist in the Space Observatories Department of Computer Sciences Corporation and is a member of the Ultraviolet Imaging Telescope team. His astronomy research focuses on stellar evolution in globular star clusters and circum-stellar material in binary star systems. Parise has used the Copernicus and International Ultraviolet Explorer satellites as well as the ASTRO experiments in pursuit of his research. Parise served as a payload specialist on STS-35, the ASTRO-1 mission.

STS-67 Crew Emblem

Observation and remote exploration of the universe in the ultraviolet wavelengths of light are the focus of the STS-67 ASTRO-2 mission. The patch depicts the ASTRO-2 telescopes in Endeavour's payload bay, orbiting high above the Earth's atmosphere. The three sets of rays correspond to the three ASTRO-2 telescopes: the Hopkins Ultraviolet Telescope (HUT), the Ultraviolet Imaging Telescope (UIT), and the Wisconsin Ultraviolet Photo-Polarimeter Experiment (WUPPE). The telescopes are co-aligned to simultaneously view the same astronomical object, as shown by the convergence of the rays on the NASA symbol. This symbol also represents the excellence of the union of the NASA teams and universities in the exploration of the universe through astronomy. Celestial targets include the observations of planets, stars, and galaxies as shown in the design. The observations performed on ASTRO-2 will contribute to our knowledge and understanding of the vast universe, from the planets in our solar system to the farthest reaches of space.

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LOCKHEED MARTIN

G. T. Oppliger
President

January 24, 1996

Dear SPC Team Member,

When Endeavour was launched at 4:41 a.m. on January 11 on the first mission of 1996, it lit up the pre-dawn skies with a flash of light that could be seen from Miami to New York. This awesome moment was the result of the thousands of hours of hard work of the Shuttle team and every member can be proud of the great results.

The STS-72 mission was successful from start to finish as Colonel Brian Duffy and his astronaut crew retrieved a Japanese satellite and deployed -- and later retrieved -- a NASA free-flying spacecraft carrying four technology experiments. All phases of the mission were performed as scheduled.

Along with the STS-72 crew portrait and mission decal, we are enclosing a memento from America's 100th human space flight. The payload bay liner from Atlantis was removed after the STS-71 flight and a piece of this flown-in-space material has been laminated onto the card with the mission emblem from this historic first docking with the Russian Space Station Mir.

STS-72 was an excellent way to start 1996 and I am confident that, in spite of distractions beyond our control, our team will remain focused on doing their job in the highly professional way the world has come to expect.

Thanks for all you do.

Sincerely,

Gerry Oppliger

National Aeronautics and
Space Administration

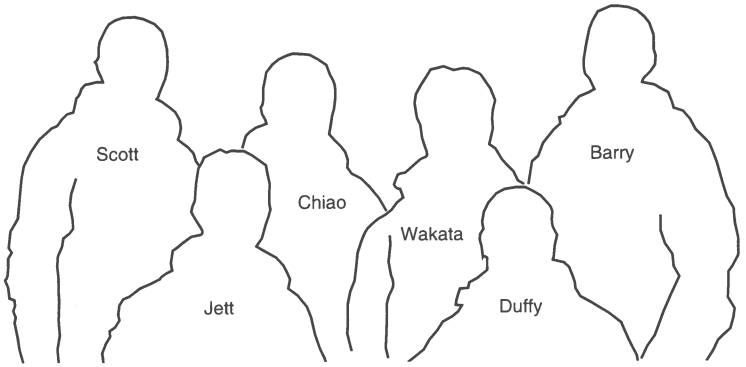
Crew of Space Shuttle
Mission STS-72

National Aeronautics and Space Administration

JSCCL-148

The Crew of Space Shuttle Mission STS-72

Commander
Brian Duffy (Col., USAF)
Born in Boston, Massachusetts, Brian Duffy received a B.S. degree in mathematics from the United States Air Force Academy and an M.S. degree in systems management from the University of Southern California. A distinguished graduate of the USAF Undergraduate Pilot Training School where he was awarded the Undergraduate Pilot Training Flying Training Award, Brian Duffy was also a distinguished graduate of his USAF Test Pilot School class. During his flying career, he has logged over 4,000 hours of flight time in more than 25 different aircraft. He has piloted two Space Shuttle missions and has accrued over 453 hours in space. STS-72 is his third Space Shuttle flight. Under his command, the mission will retrieve a satellite, deploy and retrieve another, and conduct two spacewalks to demonstrate and evaluate techniques to be used in the assembly of the Space Station.



Pilot
Brent W. Jett, Jr. (LCDR, USN)
Brent Jett was born in Pontiac, Michigan, and grew up in Fort Lauderdale, Florida. He earned a B.S. degree in aerospace engineering from the U.S. Naval Academy, graduating first in his class of 976 students. He also earned an M.S. degree in aeronautical engineering from the U.S. Naval Postgraduate School. Jett's flying experience includes three years as a test pilot and four years of operational deployments on board aircraft carriers during which he accumulated over 450 shipboard landings in the F-14 Tomcat. A graduate of the Navy Fighter Weapons School (TOPGUN), and a distinguished graduate of the Naval Test Pilot School, he has logged over 2,500 flight hours in more than 30 different operational and test aircraft. An astronaut since 1992, Jett has worked technical issues for the Operations Development Branch of the Astronaut Office and has served as the Ascent/Entry capcom in Mission Control. STS-72 will be Jett's first Space Shuttle mission.

Mission Specialist
Daniel T. Barry (M.D., Ph.D.)
Born in Norwalk, Connecticut, Dan Barry received a B.S. degree in electrical engineering from Cornell University as well as M.S. and M.A. degrees, and a Ph.D. in electrical engineering/computer science from Princeton University. He was also a National Science Foundation Postdoctoral Fellow in Physics at Princeton. Barry subsequently earned a doctorate in medicine from the University of Miami. He completed internship and residency at the University of Michigan and continued as an assistant professor in the Department of Physical Medicine and Rehabilitation and in the Bioengineering Program. His primary scientific interests include signal processing theory, algorithms, and applications, particularly nonstationary biological signals. His tenure was approved in May 1992. Dr. Barry has five patents, over 30 articles in scientific journals, and has served on two scientific journal editorial boards. His work has been supported by the National Institutes of Health, the National Science Foundation, the Grass Foundation, and the American Heart Association of Michigan. An astronaut since 1992, Dr. Barry has worked on primary payloads for the Mission Development Branch of the Astronaut Office, portable computing issues for the Space Shuttle, the Human Research Policy and Procedures Committee, and in the Shuttle Avionics Integration Laboratory at the Johnson Space Center. STS-72 will be Dr. Barry's first Space Shuttle mission. He will perform a spacewalk and operate several scientific payloads on the flight.

Mission Specialist
Leroy Chiao (Ph.D.)
Leroy Chiao was born in Milwaukee, Wisconsin, and grew up in Danville, California. He received a B.S. degree in chemical engineering from the University of California, Berkeley, and an M.S. degree as well as a Ph.D. in chemical engineering from the University of California. Formerly associated with the Lawrence Livermore National Laboratory in Livermore, California, where he conducted research in chemical reaction engineering and processing of advanced polymer composite materials, Dr. Chiao has published over 20 technical papers and has given technical seminars at the Beijing Institute of Aeronautical Materials and at the Changsha Institute of Technology in the Peoples Republic of China. An instrument-rated pilot, Dr. Chiao has logged over 1,100 flight hours in a variety of aircraft. He was selected to be a NASA astronaut in 1990 and has been involved with Space Shuttle flight software verification in the Shuttle Avionics Integration Laboratory. He has also addressed crew equipment, Spacelab, Spacehab, and payload issues for the Astronaut Office Mission Development Branch as well as training issues in the Astronaut Office Mission Support Branch. A veteran of the 15-day flight of STS-65, Dr. Chiao has accomplished 236 orbits of Earth to travel a total of 6.1 million miles in space. With the completion of his first Space Shuttle mission, he logged nearly 354 hours in space. STS-72 will be Dr. Chiao's second Space Shuttle mission during which he will conduct two spacewalks to evaluate assembly techniques for the Space Station.

Mission Specialist
Winston E. Scott (CAPT, USN)
Winston E. Scott was born in Miami, Florida. He received a B.A. degree in music from Florida State University and an M.S. degree in aeronautical engineering from the U.S. Naval Postgraduate School. He subsequently entered the Naval Aviation Officer Candidate School and was designated a Naval Aviator, thereafter completing training in both tactical jet and rotary-wing aircraft. Scott was among a group of 15/25 percent of selectees from Navy Officer applicants to be designated an aerospace engineering duty officer (AEDO). As an AEDO, Scott served as a production test pilot at the Naval Aviation Depot, Naval Air Station Jacksonville, Florida, where he flew the F/A-18 Hornet and the A-7 Corsair aircraft. He was also appointed Director of the Product Support (engineering) Department where he was in charge of 242 engineers, technicians, logistics managers, and administrative personnel. Scott was subsequently assigned as the Deputy Director of the Tactical Aircraft Systems Department at the Naval Air Development Center at Warminster, Pennsylvania. As a research and development project pilot, Scott flew the F-14, the F/A-18, and the A-7. He has accumulated more than 2,700 hours of flight time in 20 different military and civilian aircraft, and more than 200 shipboard landings. In addition to his military flight and research career, Winston Scott was an associate instructor of electrical engineering at both Florida A&M University and Florida Community College at Jacksonville. An astronaut since 1992, Scott has supported Space Shuttle launches and landings at the Kennedy Space Center in Florida as a member of the Astronaut Support Personnel team. He also was assigned lead astronaut to the Shuttle Avionics Integration Laboratory. STS-72 is his first Space Shuttle mission.

Mission Specialist
Koichi Wakata (NASDA Astronaut)
Koichi Wakata was born in Omiya, Saitama, Japan. He received a B.S. degree in aeronautical engineering from Kyushu University and an M.S. degree in applied mechanics also from Kyushu University. Following graduation, Wakata joined Japan Airlines (JAL) where he was designated a structural engineer and later assigned to the Airframe Group, Systems Engineering Office, Engineering Department. During his tenure with JAL, Wakata was involved in analysis of structural damage and its countermeasure, and research on structural integrity of transport aircraft, including a corrosion prevention program and studies on environmental effects on polished aluminum skin of commercial aircraft fuselage. Selected to be an astronaut by the National Space Development Agency of Japan (NASDA) in 1992, Wakata reported that same year to NASA Johnson Space Center to train for future Space Shuttle flight crews. While involved with astronaut training, Wakata also provided payload science support for the Astronaut Office Mission Development Branch and worked on Space Shuttle flight software verification testing in the Shuttle Avionics Integration Laboratory. STS-72 will be Koichi Wakata's first Space Shuttle mission. He is the third Japanese astronaut to fly aboard the United States Space Shuttle.

STS-72 Crew Patch

The STS-72 patch depicts the Orbiter Endeavour and some of the payloads on the flight. The Japanese satellite SFU (Space Flyer Unit) is shown in a free-flying configuration with the solar array panels deployed. The inner gold border of the patch represents the SFU's distinct octagonal shape. Endeavour will rendezvous with and retrieve SFU at an altitude of approximately 250 nautical miles. The Office of Aeronautics and Space Technology's (OAST) flyer satellite is shown just after release from the remote manipulator system. The OAST satellite will be deployed at an altitude of 165 nautical miles to fly free for two days gathering scientific data. The payload bay contains equipment for the secondary payloads: the Shuttle Laser Altimeter and the Shuttle Solar Backscatter Ultraviolet instrument. There are two extravehicular activities planned to test hardware for assembly of the International Space Station. The stars represent the crew's hometowns in the United States and Japan.

National Aeronautics and
Space Administration

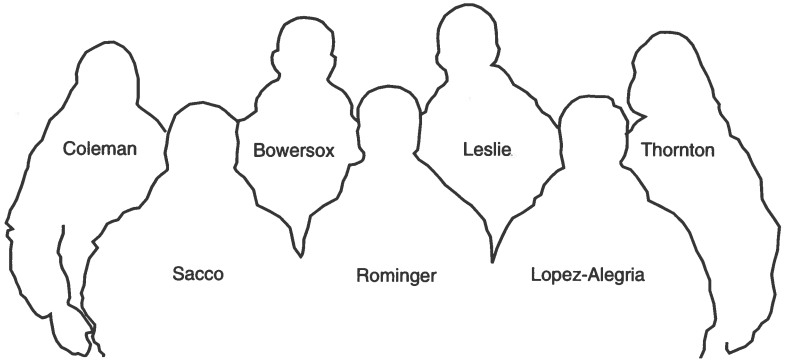
Crew of Space Shuttle
Mission STS-73

National Aeronautics and Space Administration

JSCCL-146

The Crew of Space Shuttle Mission STS-73

Commander
Kenneth D. Bowersox (Cdr., USN)
Kenneth Bowersox was born in Portsmouth, Virginia, and grew up in Bedford, Indiana. An astronaut since 1987, he has a B.S. degree in aerospace engineering from the United States Naval Academy and an M.S. in mechanical engineering from Columbia University. A test pilot with over 300 carrier landings to his credit, Bowersox was the pilot on STS-50, the First United States Microgravity Laboratory, and most recently served as pilot on STS-61, the first Hubble Space Telescope servicing mission. He has logged more than 591 hours in space.



Pilot
Kent V. Rominger (Cdr., USN)
Kent Rominger was born in Del Norte, Colorado. He earned a B.S. degree in civil engineering from Colorado State University and an M.S. degree in aeronautical engineering from the United States Naval Postgraduate School. A distinguished graduate of the U.S. Naval Test Pilot School and a former recipient of the Naval Air Test Center "Test Pilot of the Year" award, Rominger is a highly decorated Navy pilot whose last assignment with the Navy was as the Operations Officer for Fighter Squadron 211 aboard the USS Nimitz in the Arabian Gulf during Desert Storm. Rominger joined the astronaut corps in 1992. USML-2 will be his first Space Shuttle flight.

Mission Specialist
Catherine G. Coleman (Ph.D., Capt., USAF)
Born in Charleston, South Carolina, Dr. Catherine "Cady" Coleman earned a B.S. degree in chemistry from the Massachusetts Institute of Technology and a doctorate in polymer science and engineering from the University of Massachusetts. She did research on non-linear optical materials for the Air Force and has set endurance and tolerance records as a test subject for the centrifuge program at the Armstrong Aeromedical Laboratory. An astronaut since 1992, Dr. Coleman was initially assigned to verify mission-critical Shuttle software for upcoming flights and has also served as the Special Assistant to the Johnson Space Center Director. USML-2 will be her first Space Shuttle mission.

Mission Specialist
Michael E. Lopez-Alegria (Cdr., USN)
Michael Lopez-Alegria was born in Madrid, Spain, and grew up in Mission Viejo, California. A Naval Aviator since 1981, he earned a B.S. degree in systems engineering from the United States Naval Academy and an M.S. degree in aeronautical engineering from the United States Naval Postgraduate School. Before becoming an astronaut in 1992, Lopez-Alegria served as a test pilot and program manager at the Naval Air Test Center in Patuxent River, Maryland. As a NASA astronaut, he has held several key positions including an assignment to the Kennedy Space Center where he provided direct crew support during Shuttle launches and landings. USML-2 will be his first Space Shuttle flight.

Payload Commander
Kathryn C. Thornton (Ph.D.)
Born in Montgomery, Alabama, Dr. Kathryn Thornton received a B.S. degree in physics from Auburn University and both an M.S. degree and a Ph.D. in physics from the University of Virginia. As a NATO postdoctoral fellow, she continued her research at the Max Planck Institute for Nuclear Physics in Heidelberg, West Germany. An astronaut since 1984, Dr. Thornton has flown on Missions STS-33 and STS-49. She most recently served as an EVA specialist aboard the STS-61 Hubble Space Telescope service and repair mission. Dr. Thornton has logged more than 593 hours in space, including over 21 hours of spacewalks.

Payload Specialist
Fred W. Leslie (Ph.D.)
Dr. Fred Leslie was born in Ancon, Panama. Currently a research scientist at the Marshall Space Flight Center, Space Science Laboratory, Dr. Leslie holds a B.S. degree in engineering science from the University of Texas, as well as an M.S. degree and a Ph.D. in meteorology (with a minor in fluid mechanics) from the University of Oklahoma. He was the Mission Scientist for the Spacelab-J mission and is co-investigator on the USML-2 Geophysical Fluid Flow Cell Experiment. He is a commercial and instrument-rated pilot with more than 900 hours in various aircraft. An avid skydiver, Leslie also holds a world record as a participant in the 200-person free-fall formation set in October 1992. USML-2 will be Dr. Leslie's first Space Shuttle mission.

Payload Specialist
Albert Sacco, Jr. (Ph.D.)
Born in Boston, Massachusetts, Dr. Albert Sacco has a B.S. degree in chemical engineering (with honors) from Northeastern University. He later was awarded a Ph.D. in chemical engineering from the Massachusetts Institute of Technology. Currently, Chairman of the Chemical Engineering Department at Worcester Polytechnic Institute, Dr. Sacco has done extensive research on carbon filament initiation and growth, catalyst deactivation, and zeolite synthesis. He was also honored as one of four United States experts invited to head a joint United States/European NATO Advanced Study Institute. Sacco was the principal investigator (PI) on the USML-1 Zeolite Crystal Growth experiment and is PI for similar USML-2 investigations. He also served as the crystal growth alternate payload specialist on USML-1. USML-2 will be Dr. Sacco's first space flight.

STS-73 Crew Patch Description

The crew patch of STS-73, the second flight of the United States Microgavity Laboratory (USML-2), depicts Shuttle Columbia in the vastness of space. In the foreground are the classic regular polyhedrons that were investigated by Plato and later Euclid. The Pythagoreans were also fascinated by the symmetrical three-dimensional objects whose sides are the same regular polygon. The tetrahedron, the cube, the octahedron, and the icosahedron were each associated with the "Natural Elements" of that time: fire (on this mission combustion science), earth (crystallography), air and water (fluid physics). An additional icon shown as the infinity symbol was added to further convey the discipline of fluid mechanics. The shape of the emblem represents a fifth polyhedron, a dodecahedron, which the Pythagoreans thought corresponded to a fifth element that represents the cosmos.

STS-73 is a sixteen-day Spacelab mission. The flight will be dedicated to microgravity research with a focus on fluid physics, materials science, biotechnology, and combustion science.

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LOCKHEED MARTIN

G. T. Oppliger
President

November 29, 1995

Dear SPC Team Member,

People all over the world watched with awestruck wonderment on November 15th as the crew of the U.S. Space Shuttle Atlantis installed the Docking Module on the Russian Space Station Mir.

This was truly an historic milestone in space exploration as we clearly demonstrated the know-how needed to construct and operate the long-term International Space Station in a framework of international cooperation and coordination.

Everyone — including our entire SPC Team — who played a role in preparing Atlantis and its payload for STS-74 can be very proud of the great success which resulted.

This was our last launch of 1995 and signaled the end of a tremendously successful year of Shuttle operations. Well done to all!

Preparations are, of course, already under way for the launch of Endeavour on January 11, 1996 and we are confidently preparing to provide outstanding processing support for all the other seven missions planned for the coming year.

Many thanks for your sustained hard work and performance excellence.

Sincerely,

Gerry

Gerry Oppliger

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-74

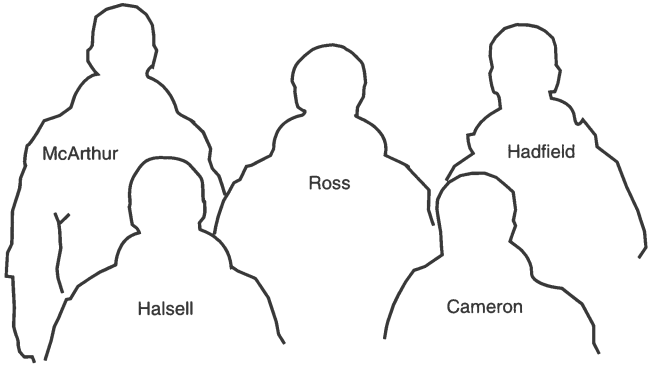
National Aeronautics and Space Administration

JSCCL-147

The Crew of Space Shuttle Mission STS-74

Commander
Kenneth D. Cameron (Col., USMC)
Born in Cleveland, Ohio, Kenneth D. Cameron is a graduate of the Massachusetts Institute of Technology from which he received B.S. and M.S. degrees in aeronautics and astronautics. He enlisted in the Marine Corps at the age of 19. Following duty in the infantry, flight training, and college assignments, he later graduated from the United States Naval Test Pilot School and became a test pilot at the Naval Air Test Center. Cameron logged over 3,400 hours flying time in 47 different types of aircraft. An astronaut since 1985, Cameron's NASA assignments include work on the tethered satellite payload, flight software testing in the Shuttle Avionics Integration Laboratory, launch support activities at Kennedy Space Center, and Space Shuttle spacecraft communicator (capcom) in Mission Control. He was also the first NASA Director of Operations in Star City, Moscow, where he worked with the Cosmonaut Training Center staff to set up a support system for U.S. astronaut operations and training. STS-74 will be Cameron's third Space Shuttle mission and his second flight as a Space Shuttle commander. During his two Shuttle missions he logged over 365 hours of space flight. During STS-74, Cameron will be responsible for commanding and flying NASA's historic second Space Shuttle mission to rendezvous and dock with the Russian Space Station Mir.

Pilot
James D. Halsell, Jr. (Lt. Col., USAF)
James D. Halsell, Jr., was born and raised in West Monroe, Louisiana. Halsell received a B.S. degree in engineering from the United States Air Force Academy, an M.S. degree in management from Troy University, and another M.S. degree in space operations from the Air Force Institute of Technology. At the Air Force Institute of Technology, Halsell completed a thesis sponsored by the NASA Crew Systems Division on a prototype for a space rescue transfer vehicle using off-the-shelf equipment. Halsell then attended the Air Force Test Pilot School where he graduated first in his class and was awarded the Liethen/Tittle Trophy. Halsell was working as an Air Force F-16 and SR-71 test pilot at Edwards Air Force Base, California, when he was selected by NASA in 1990 to be an astronaut. In addition to astronaut training at NASA, Halsell worked as the astronaut spacecraft



communicator (capcom) in Mission Control, and served on an astronaut team to prepare the Space Shuttle vehicles for flight at the Kennedy Space Center, Florida. Halsell was the pilot on STS-65, a 15-day flight which set a new flight-duration record for the Space Shuttle Program. During this mission, Halsell traveled 6.1 million miles, completed 236 orbits of Earth, and logged a total of 353 hours and 55 minutes in space. During STS-74, Halsell will pilot the Space Shuttle during rendezvous and docking with the Russian Space Station Mir.

Mission Specialist
Chris A. Hadfield (Major, CAF)
Chris A. Hadfield is a Canadian Space Agency astronaut. Hadfield was born in Sarnia, Ontario, Canada, and grew up in Milton, Ontario. An astronaut since 1992, he has a bachelor degree in mechanical engineering with honors from the Royal Military College in Kingston, Ontario, and performed post-graduate research at the University of Waterloo. He also earned an M.S. degree in aviation systems from the University of Tennessee. Hadfield attended the United States Air Force Test Pilot School where he graduated first in his class and was awarded the Liethen/Tittle Trophy. Hadfield was also the winner of the 1991 U.S. Naval Test Pilot of the Year award. As a fighter pilot and test pilot, he has logged over 2,500 hours in more than 50 aircraft types. While involved in astronaut training, Hadfield worked on a variety of technical and safety issues for the Astronaut Office Operations Development Branch and provided launch support at Kennedy Space Center. Hadfield is the first Canadian mission specialist and STS-74 is his first Space Shuttle flight.

Mission Specialist
William S. McArthur, Jr. (Lt. Col., USA)
William "Bill" McArthur was born in Laurinburg, North Carolina, and grew up in Wakulla, North Carolina. He received a B.S. degree in applied science and engineering from the United States Military Academy, West Point, and an M.S. degree in aerospace engineering from the Georgia Institute of Technology. A distinguished graduate of the U.S. Army Aviation School and Master Army Aviator, McArthur has logged over 3,400 flight hours in 37 different types of aircraft. Following graduation from the U.S. Naval Test Pilot School in 1987, McArthur was assigned to NASA as a vehicle integration test engineer at the Johnson Space Center. Selected as an astronaut in 1990, he has worked with the solid rocket booster program and served as an astronaut spacecraft communicator (capcom). McArthur served as a mission specialist on STS-58, a record Space Shuttle mission of 14 days duration. He has completed 225 orbits of Earth and has logged more than 336 hours in space. STS-74 is his second Space Shuttle mission.

Mission Specialist
Jerry L. Ross (Col., USAF)
Jerry Ross was born in Crown Point, Indiana. He received B.S. and M.S. degrees in mechanical engineering from Purdue University where he was an Air Force ROTC student. Formerly a flight-test engineer on the B-1, Ross has flown in 21 different types of aircraft, holds a private pilot's license, and has logged over 2,400 flying hours, the majority in military aircraft. He served as a NASA payload officer responsible for operational integration of payloads with the Space Shuttle Orbiter. An astronaut since 1980, he has been involved with EVA (extravehicular activity or spacewalk) hardware and technique development, and has worked as an astronaut spacecraft communicator (capcom) in Mission Control. Jerry Ross has also served as the Astronaut Chief of the Mission Support Branch, served as a board member on the Astronaut Selection Committee, and been the Acting Deputy Chief of the Astronaut Office. A veteran of four space flights, Ross has logged 653 hours in space including nearly 23 hours on four spacewalks. STS-74 is his fifth Space Shuttle mission.

STS-74 Crew Patch

The STS-74 crew patch depicts the Orbiter Atlantis docked to the Russian Space Station Mir. The central focus is on the Russian-built docking module, drawn with shading to accentuate its pivotal importance to both Mission STS-74 and the NASA-Mir Program. The rainbow across the horizon represents the Earth's atmosphere, the thin membrane protecting all nations, while the three flags across the bottom show those nations participating in STS-74: Russia, Canada, and the United States. The sunrise is symbolic of the dawn of a new era in NASA space flight—that of Space Station construction.

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LOCKHEED MARTIN

Gerry Oppliger
President

March 13, 1996

Dear SPC Team Member,

Columbia soared into orbit after a very smooth countdown and an on time launch on February 22.

Although there was a well publicized payload problem caused by the broken tether, the flight hardware that carried it into space performed as it was supposed to. We did our job well.

Two missions completed and six more to go! Preparing Shuttles for the rest of the 1996 manifest will be a real challenge and I am confident that our team will continue to perform in an outstanding manner.

Keep focused on our processing mission and always remember that safety is our number one priority.

Thanks to you and your teammates for the good work.

Sincerely,

Gerry Oppliger

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-75

National Aeronautics and Space Administration

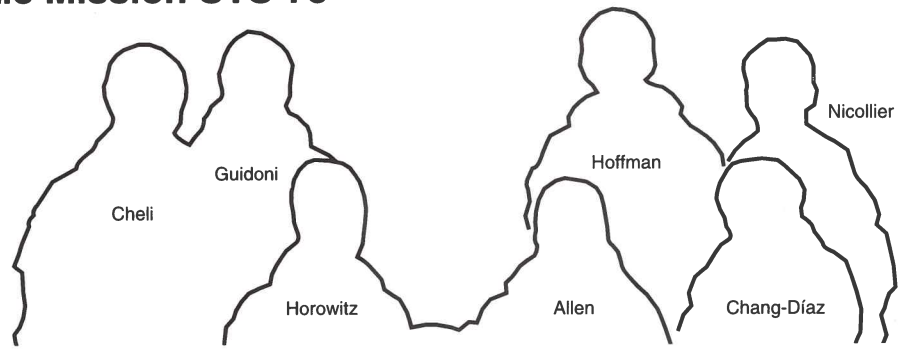
JSCCL-149

The Crew of Space Shuttle Mission STS-75

Commander
Andrew M. Allen (Lt. Colonel, USMC)
Andrew Allen was born in Philadelphia, Pennsylvania. He received a BS degree in mechanical engineering from Villanova University where he was a member of the Navy ROTC and where he received his commission from the United States Marine Corps. A graduate of the United States Naval Test Pilot School, Allen was a test pilot and flew such high performance jet aircraft as the F-4 Phantom and the F/A-18 Hornet. He is also a graduate of the Marine Weapons and Tactics Instructor Course and the Naval Fighter Weapons School (Topgun). As a military pilot, Allen logged over 5,000 flight hours in more than 30 different aircraft. Andrew Allen is a veteran of two space flights in which he served as pilot and during which he logged over 526 hours in space. On his first flight in 1992, he was a member of the crew that first deployed the Tethered Satellite. STS-75 is his third space flight, the reflight of the Tethered Satellite System (TSS), and the third flight of the United States Microgravity Payload (USMP-3).

Pilot
Scott J. "Doc" Horowitz, Ph.D. (Lt. Colonel, USAF)
Scott Horowitz was born in Philadelphia and grew up in Thousand Oaks, California. He received a BS degree in engineering from California State University at Northridge and an MS degree and doctorate in aerospace engineering from the Georgia Institute of Technology. He was an associate scientist for the Lockheed-Georgia Company before joining the United States Air Force. Scott has been a T-38 instructor pilot, F-15 Eagle fighter pilot, and performed research for the Air Force Human Resources Laboratory. He was an adjunct professor for Embry Riddle University, where he taught graduate level courses in aircraft design, aircraft propulsion, and rocket propulsion, and also a professor at California State University at Fresno where he conducted graduate level courses in mechanical engineering. A distinguished graduate of the United States Air Force Test Pilot School, Scott has flown over 3,500 hours in more than 40 different aircraft. STS-75 is his first Space Shuttle mission.

Mission Specialist
Franklin R. Chang-Díaz, Ph.D.
Born in San Jose, Costa Rica, Chang-Díaz received a BS degree in mechanical engineering from the University of Connecticut and a doctorate in applied plasma physics from the Massachusetts Institute of Technology (MIT). He has been developing a new concept in rocket propulsion based on high-temperature plasma and, as Visiting Scientist with the MIT Plasma Fusion Center, he led the plasma propulsion program there from 1981 to 1993 to develop this technology for future human missions to Mars. In 1994, he was appointed Director of the Advanced Space Propulsion Laboratory at the Johnson Space Center where he continues his research on plasma rockets. Dr. Chang-Díaz is also an adjunct professor of physics at the University of Houston. In 1992, he was a member of the crew that first deployed the Tethered Satellite. He has logged 656 hours in space during four flights and is the payload commander for STS-75, his fifth Space Shuttle mission.



Mission Specialist (European Space Agency, ESA)
Maurizio Cheli
Born in Modena, Italy, Maurizio Cheli graduated from the Italian Air Force Academy, studied geophysics at the University of Rome, and received a master of science degree in aerospace engineering from the University of Houston. Lt. Colonel Cheli, Italian Air Force, was the top graduate of both the Italian Air Force War College and the Empire Test Pilot School, Boscombe Down, United Kingdom. While assigned as a test pilot to the Italian Air Force Flight Test Center, he served as a Tornado and B-707 tanker project pilot on a variety of test programs. Cheli has accrued over 3,000 flying hours in more than 50 different types of fixed-wing aircraft and helicopters. In 1992, he was selected by the European Space Agency for astronaut training and later the same year was sent to the Johnson Space Center to become a mission specialist. STS-75 is Cheli's first Space Shuttle mission.

Mission Specialist
Jeffrey A. Hoffman, Ph.D.
Jeffrey Hoffman was born in Brooklyn and grew up in Scarsdale, New York. He received a BA degree in astronomy from Amherst College, a master of materials science from Rice University, and a doctorate of philosophy in astrophysics from Harvard University from which he subsequently won a Harvard University Sheldon International Fellowship. Dr. Hoffman has authored more than 25 professional journal articles during three years of postdoctoral work at Leicester University in England, and three years at the Center for Space Research at the Massachusetts Institute of Technology. He is a veteran of four Space Shuttle missions since joining NASA in 1978. On his first space flight in 1985, he performed the first STS contingency spacewalk. In 1992, he was a member of the crew that first deployed the Tethered Satellite. In 1993, Hoffman made three spacewalks during the repair and servicing of the Hubble Space Telescope. He has logged more than 843 hours and 15 million miles in space. STS-75 is his fifth Space Shuttle flight.

Mission Specialist (European Space Agency, ESA)
Claude Nicollier
Born in Vevey, Switzerland, Claude Nicollier received a BS degree in physics from the University of Lausanne and an MS degree in physics from the University of Geneva. Nicollier worked as a graduate scientist with the Institute of Astronomy at Lausanne University and at the Geneva Observatory. His research in the field of stellar photometry included several stays at mountaintop observatories in Switzerland and Chile. ESA selected him in 1978 as a member of the first group of European astronauts, and two years later he joined the astronaut program for training as a mission specialist. Nicollier is a Captain in the Swiss Air Force and has logged 5,400 hours flying time, including 3,800 hours in jet aircraft. He also flew DC-9 type aircraft with Swissair for three years (1974-1976) and is a graduate of the Empire Test Pilot's School. STS-75 is Nicollier's third Space Shuttle mission. On his first flight in 1992, he was a member of the crew that first deployed the Tethered Satellite, and in 1993 he was on the first Hubble Space Telescope servicing mission. He has logged more than 450 hours in space.

Payload Specialist (Agencia Spaziale Italiana, ASI)
Umberto Guidoni, Ph.D.
Umberto Guidoni was born in Rome and educated at the University of Rome where he received a BS degree in physics and a doctorate in astrophysics. Following graduation, Dr. Guidoni conducted research work as a National Committee for Nuclear Energy (CNEN) postdoctoral fellow and a guest scientist in the European Nuclear Energy Agency's (EURATOM) controlled fusion program. He also worked at the Space Physics Institute as a project scientist in charge of the development of a plasma experiment (RETE) that is one of the three science payloads mounted on the Tethered Satellite. A member of the Italian Space Society and author of professional journal articles, Guidoni was selected by the Italian space agency, ASI, as one of two Italian scientists to be trained as a payload specialist for the Space Shuttle TSS-1 mission. He was later assigned to the Astronaut Office at the Johnson Space Center for specialized space flight training. The Tethered Satellite System Reflight (TSS-1R), STS-75, is Guidoni's first Space Shuttle mission.

STS-75 Crew Patch

The STS-75 crew patch depicts the Space Shuttle Columbia and the Tethered Satellite connected by a 21km electrically conducting tether. The Orbiter/satellite system is passing through the Earth's magnetic field which, like an electric generator, will produce thousands of volts of electricity. Columbia is carrying the United States Microgravity Pallet to conduct microgravity research in material science and thermodynamics. The tether is crossing the Earth's terminator signifying the dawn of a new era for space tether applications and in mankind's knowledge of the Earth's ionosphere, material science, and thermodynamics.

The patch was designed for the STS-75 crew by Space Artist Mike Sanni.

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LOCKHEED MARTIN

Gerry Oppliger
President

April 3, 1996

Dear SPC Team Member,

Many Space Coast old timers are calling our STS-76 nighttime launch "one of the most beautiful ever."

The pre-dawn skies were exceptionally clear on March 22 as Atlantis blazed away from Pad B at 3:13 a.m. precisely on schedule.

The preparation and countdown for this mission proceeded so smoothly that everyone seemed to take a 24 hour weather delay (from 21 to 22 March) right in stride.

This was the third of our missions involving a link-up with the Russian Space Station Mir and on 23 March Atlantis docked flawlessly with Mir. Shannon Lucid of the Atlantis crew moved into Mir for a four and a half month "tour of duty" with the Russians. This crucial "Mir" mission, like the previous two, will help build joint space experience and begin joint scientific research.

This was a very successful mission from start to finish and I was particularly proud of the fact that we achieved mission success with a very brief 6 minute launch window staring us in the face.

Once again, I'd like to thank you and your colleagues for a job well done!

Sincerely,

Gerry

Gerry Oppliger

National Aeronautics and
Space Administration

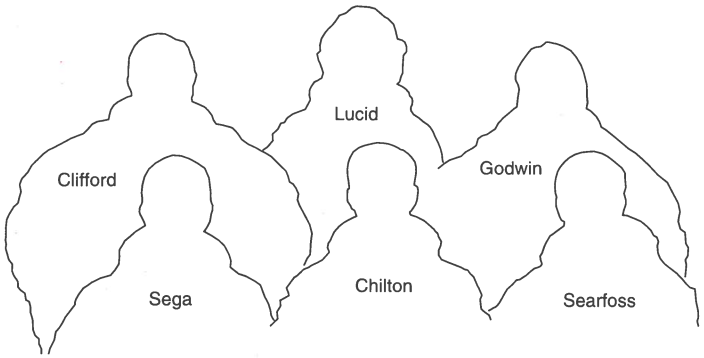
Crew of Space Shuttle
Mission STS-76

National Aeronautics and Space Administration

JSCCL-150

The Crew of Space Shuttle Mission STS-76

Commander
Kevin P. Chilton (Colonel, USAF)
Kevin Chilton was born in Los Angeles, California. He earned a bachelor of science degree in engineering sciences from the U.S. Air Force Academy and a master of science degree in mechanical engineering from Columbia University. After graduating from Air Force pilot training, he served as a combat-ready pilot and instructor in the RF-4 Phantom II and the F-15 Eagle. Following graduation from the USAF Test Pilot School, he conducted weapons and systems tests in all models of the F-15 and F-4. He has logged over 4,000 hours of flight time in more than 20 different types of aircraft. Chilton became an astronaut in 1988 and flew as the pilot of Missions STS-49 and STS-59.



Pilot
Richard A. Searfoss (Lt. Colonel, USAF)
Richard Searfoss was born in Mount Clemens, Michigan, and grew up in Portsmouth, New Hampshire. He earned a bachelor of science degree in aeronautical engineering from the U.S. Air Force Academy in 1978, and master of science degree in aeronautics from the California Institute of Technology on a National Science Foundation Fellowship in 1979. He flew the F-111 as an aircraft commander, instructor pilot, and weapons and tactics officer at Lakenheath, England, and Mountain Home Air Force Base, Idaho. A graduate of the USAF Fighter Weapons School and the U.S. Naval Test Pilot School, Searfoss was a flight instructor at the USAF Test Pilot School at Edwards Air Force Base in California when selected for the astronaut program in 1990. He has logged over 3,500 hours flying time in 56 different types of aircraft. Searfoss flew previously as the pilot of STS-58.

Mission Specialist
Michael Richard Clifford
Rich Clifford was born in San Bernadino, California, and was raised in Ogden, Utah. He earned a bachelor of science degree from the United States Military Academy and a master of science degree in aerospace engineering from the Georgia Institute of Technology. Upon graduation from West Point, Clifford served with the 10th Calvary. He then completed pilot training as the top graduate of his class. He served in a variety of positions with the 2nd Armored Cavalry Regiment in Germany and was an assistant professor of mechanical engineering at West Point. Clifford became an experimental test pilot following graduation from the U.S. Naval Test Pilot School in 1986. He has flown over 3,200 hours in more than 50 types of fixed and rotary wing aircraft. Clifford became an astronaut in 1990 and flew as a mission specialist on Missions STS-53 and STS-59.

Mission Specialist
Linda M. Godwin (Ph.D.)
Linda Godwin was born in Cape Girardeau and grew up in Jackson, Missouri. She earned a bachelor of science degree from Southeast Missouri State University in physics and mathematics and an M.A. and Ph.D. in physics from the University of Missouri, Columbia. While at the University of Missouri, she conducted research in low temperature condensed-matter physics, and authored and co-authored several scientific papers. She is an instrument-rated private pilot. She joined NASA in 1980 and served as a flight controller and payloads officer in Mission Control for several Shuttle flights. Godwin was selected as an astronaut in 1985 and is currently Deputy Chief of the Astronaut Office. She flew in space as a mission specialist aboard Atlantis on STS-37 and as the payload commander aboard Endeavour on STS-59.

Mission Specialist
Shannon W. Lucid (Ph.D.)
Shannon Lucid was born in Shanghai, China, and grew up in Bethany, Oklahoma. She received a bachelor of science degree in chemistry from the University of Oklahoma in 1963, and a master of science and doctor of philosophy degrees in biochemistry from the University of Oklahoma in 1970 and 1973, respectively. Dr. Lucid's experience includes a variety of academic assignments, including work as a chemist at Kerr-McGee in Oklahoma City, Oklahoma, and research associate with the Oklahoma Medical Research Foundation in Oklahoma City. She is a commercial, instrument, and multi-engine rated pilot. Since becoming an astronaut in 1979, she has served as Chief of Mission Support and Chief of Astronaut Appearances. A veteran of four space flights, Lucid served as a mission specialist aboard STS-51G, STS-34, STS-43, and STS-58. STS-76 is Dr. Lucid's fifth Space Shuttle flight. She will remain aboard the Mir Space Station for a planned 150 days as a member of the Mir-21 and Mir-22 expeditions.

Mission Specialist
Ronald M. Sega (Ph.D.)
Ron Sega was born in Cleveland and grew up in Northfield, Ohio, and Colorado Springs, Colorado, his hometowns. He earned a bachelor of science degree in mathematics and physics from the U.S. Air Force Academy in 1974, a master of science degree in physics from Ohio State in 1975, and a doctorate in electrical engineering from the University of Colorado in 1982. He is a professor in the Department of Electrical and Computer Engineering at the University of Colorado, Colorado Springs. While on leave from the University of Colorado, he was research associate professor of physics at the University of Houston, affiliated with the Space Vacuum Epitaxy Center. Sega has authored or co-authored over 100 technical publications. A colonel in the Air Force Reserves, he has logged over 4,000 hours as a pilot in the Air Force, Air Force Reserves, and for NASA. He became an astronaut in 1991 and flew in space as a mission specialist on STS-60, the first joint U.S./Russian Space Shuttle mission.

STS-76 Crew Patch

The STS-76 crew patch depicts the Space Shuttle Atlantis and the Russian Space Station Mir as the two space ships prepare for a rendezvous and docking. The "Spirit of 76," an era of new beginnings, is represented by the Space Shuttle rising through the circle of 13 stars in the Betsy Ross flag. STS-76 begins a new period of international cooperation in space exploration with the first Shuttle transport of a U. S. astronaut, Shannon Lucid, to Mir for extended joint space research. Frontiers for future exploration are represented by the stars and planets. The three gold trails and the ring of stars in the union form the astronaut logo. Two suited extravehicular activity (EVA) crew members in the outer ring represent the first EVA during Shuttle-Mir docked operations. The EVA objectives are to install science experiments on the Mir exterior and to develop procedures for future EVA's on the international space station. The names of the crew members encircle the patch: Commander – Kevin Chilton (USAF); Pilot – Rick Searfoss (USAF); Mission Specialist 1 – Ron Sega; Mission Specialist 2 – Rich Clifford; Mission Specialist 3 – Linda Godwin; Mission Specialist 4 (Mir) – Shannon Lucid.

The patch was designed by Brandon Clifford, student, age 12, and the crew of STS-76.

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LOCKHEED MARTIN

Gerry Oppliger
President

June 3, 1996

Dear SPC Team Member,

As the first rays of the morning sun rose over the Space Coast on May 19, the Space Shuttle Endeavour climbed into the sky at the opening of the "launch window" at 6:30 a.m. The launch capped one of the smoothest countdowns in the 35-year history of American human space flight.

STS-77 Commander John Casper and his six-member crew quickly went to work performing a variety of experiments. A mission highlight took place as the crew successfully deployed the Spartan 207 satellite with the Inflatable Antenna Experiment. The 50-foot antenna along with three 90-foot booms made an impressive sight in the NASA Television views from Endeavour. This experiment allowed scientists and engineers to test the feasibility of large, inflatable structures for use on future space projects.

A small satellite was also deployed from a canister in the cargo bay as part of the Technology Experiments Advancing Missions in Space (TEAMS) payload which included four experiments on fluids and space systems technology.

STS-77 was another example of the important work that can be performed by crews working aboard the Space Shuttle. Their mission success was possible, in large measure, because the men and women of the SPC Team did such an outstanding job preparing Endeavour for flight.

Congratulations to one and all!

Sincerely,

Gerry Oppliger

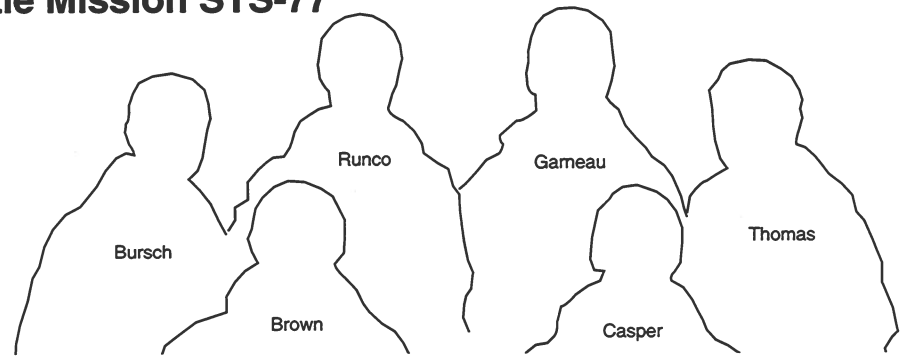
National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-77

National Aeronautics and Space Administration

JSCCL-151

The Crew of Space Shuttle Mission STS-77



Commander
John H. Casper (Colonel, USAF)
Born in Greenville, South Carolina, John Casper's hometown is Gainesville, Georgia. He earned a B.S. degree from the U.S. Air Force Academy and an M.S. degree in astronautics from Purdue University. Casper was a fighter pilot in the F-100 and F-4 and flew 229 combat missions in Vietnam. As a test pilot at the Air Force Flight Test Center, Casper was Chief, F-4E Test Team, and commanded the 6513th Test Squadron. Assigned to Air Force Headquarters, he served as Deputy Chief of Special Projects for the Deputy Chief of Staff, Plans and Operations. Casper became an astronaut in 1984. He was lead astronaut for improving the Shuttle's nosewheel steering, brakes, tires, and development of the landing drag chute. He also was an ascent/entry spacecraft communicator (capcom) in Mission Control. In 1990, Casper was pilot of STS-36, a classified Department of Defense mission. In 1993, he commanded STS-54 which deployed a Tracking and Data Relay Satellite, and in 1994 he commanded STS-62 which flew the U.S. Microgravity Payload. Casper has flown over 7,000 hours in 50 different aircraft and has logged more than 585 hours of space flight.

Pilot
Curtis L. Brown, Jr. (Lt. Colonel, USAF)
Curtis L. Brown was born in Elizabethtown, North Carolina. He received a B.S. degree in electrical engineering from the U.S. Air Force Academy. He flew A-10 aircraft at Myrtle Beach Air Force Base (AFB), South Carolina, before being reassigned to Davis-Monthan AFB, Arizona, as an A-10 instructor pilot. While an instructor pilot, he attended the USAF Fighter Weapons School and the USAF Test Pilot School. Upon graduation, he served as a test pilot in the A-10 and F-16 aircraft at Eglin AFB, Florida. Brown has logged over 4,000 hours flight time in jet aircraft. His technical assignments to date include: development of the Flight Data File, lead of the Astronaut Launch Support Team responsible for crew ingress and strap-in prior to launch and crew egress after landing, and lead spacecraft communicator (capcom). Brown was selected as an astronaut in 1987 and was pilot of STS-47 in 1992 and STS-66 in 1994. He has logged over 453 hours in space.

Mission Specialist
Andrew S. W. Thomas, Ph.D.
Dr. Andrew Thomas was born in Adelaide, South Australia. He received a B.E. degree in mechanical engineering with First Class Honors and a Ph.D. in mechanical engineering from the University of Adelaide, South Australia. He then joined the Lockheed Aeronautical Systems Company, Marietta, Georgia, as a research scientist and was responsible for experimental investigations into the control of fluid dynamic instabilities and their consequences to aircraft drag. He also served as head of the Advanced Flight Sciences Department and manager of the research laboratory, the wind tunnels, and the test facilities used in studies of various problems in advanced aerodynamics and aircraft flight tests. Dr. Thomas was later appointed manager of Lockheed's Flight Sciences Division and directed the technical efforts in vehicle aerodynamics, flight controls and propulsion systems that support the company's fleet of production aircraft. This organization also provided technical and design support to the advanced aerospace vehicle development programs sponsored within the company by the United States Air Force and NASA. In 1989, he joined the Jet Propulsion Laboratory (JPL) and was appointed leader of the JPL program for microgravity materials processing in space. Dr. Thomas was selected to be an astronaut by NASA in March 1992. STS-77 will be his first Space Shuttle flight.

Mission Specialist
Daniel W. Bursch (Commander, USN)
Daniel Bursch was born in Bristol, Pennsylvania, and grew up in Vestal, New York. He earned a B.S. degree in physics from the U.S. Naval Academy, and an M.S. degree in engineering science from the Naval Postgraduate School. After training as an A-6E Intruder bombardier/navigator, he served aboard the USS John F. Kennedy and USS America. After working as a project test flight officer for the A-6 Intruder, he served as a flight instructor at the U.S. Naval Test Pilot School. Bursch worked as Strike Operations Officer for Commander, Cruise-Destroyer Group 1, making deployments to the Indian Ocean aboard the USS Long Beach and USS Midway. He has over 2,500 flight hours in more than 35 different aircraft. Bursch became an astronaut in 1991 and flew as a mission specialist aboard STS-51 in 1993 and STS-68 in 1994. He has logged more than 505 hours in space.

Mission Specialist
Mario Runco, Jr.
Mario Runco, Jr., was born in The Bronx and grew up in Yonkers, New York. He earned a B.S. degree in meteorology and physical oceanography from the City College of New York and an M.S. degree in meteorology from Rutgers University. Upon graduation from Rutgers, Runco worked as a research hydrologist for the U.S. Geological Survey. He then joined the New Jersey State Police and worked as a State Trooper until he entered the U.S. Navy. In the Navy, Runco was first assigned as a research meteorologist and then served aboard USS Nassau (LHA-4) where he earned the designation of Surface Warfare Officer. He later taught the Geophysics Technical Readiness Laboratory course at the Naval Postgraduate School. As commanding officer of Oceanographic Unit Four embarked in USNS Chauvenet (T-AGS-29), he led hydrographic and oceanographic surveys of the Java Sea and Indian Ocean. Runco was selected as a NASA astronaut in 1987. He was a mission specialist on STS-44 in 1991 and STS-54 in 1993. During STS-54, Mario Runco was the 48th American to walk in space during a spacewalk which lasted 4½ hours. He has spent over 310 hours in space.

Mission Specialist (Canadian Space Agency)
Marc Garneau, Ph.D.
Dr. Marc Garneau was born in Quebec City, Canada. He received a B.S. degree in engineering physics from the Royal Military College of Kingston and a Ph.D. in electrical engineering from the Imperial College of Science and Technology, London, England. He also attended the Canadian Forces Command and Staff College of Toronto. Marc Garneau was one of six Canadian astronauts selected in December 1983. He was detailed to the Canadian Astronaut Program from the Department of National Defense in February 1984 to begin astronaut training. He flew as a payload specialist on STS-41G in 1984 and has accumulated more than 197 hours in space. He was Deputy Director of the Canadian Astronaut Program in 1989, providing technical and program support in the preparation of experiments to fly during future Canadian missions. He was selected for astronaut candidate training at the Johnson Space Center in July 1992. STS-77 will be Dr. Garneau's second Space Shuttle flight.

STS-77 Crew Patch

The STS-77 crew patch displays the Shuttle Endeavour in the lower left and its reflection within the tripod and concave parabolic mirror of the SPARTAN Inflatable Antenna Experiment (IAE). The center leg of the tripod also delineates the top of the SpaceHab's shape, the rest of which is outlined in gold just inside the red perimeter. The SpaceHab is carried in the payload bay and houses the CFZF and SEF experiments. Also depicted within the confines of the IAE mirror are the mission's rendezvous operations with the PAM/STU satellite and a reflection of Earth. The PAM/STU satellite appears as a bright six-pointed star-like reflection of the sun on the edge of the mirror with Endeavour in position to track it. The sunglint on the mirror's edge, which also appears as an orbital sunset, is located over Goddard Space Flight Center, the development facility for the SPARTAN/IAE and TEAMS experiments. The reflection of Earth is oriented to show the individual countries of the crew as well as the ocean which Captain Cook explored in the original Endeavour. The mission number "77" is featured as twin stylized chevrons and an orbiting satellite as adapted from NASA's logo. The stars at the top are arranged as seen in the northern sky in the vicinity of the constellation Ursa Minor. The field of 11 stars represents both the TEAMS cluster of experiments (the four antennae of GANE, the single canister of LMTE, the three canisters of VTRE, and the three canisters of PAM/STU) and the 11th flight of Endeavour. The constellation at the right shows the four stars of the Southern Cross for the fourth flight of SpaceHab.

United Space Alliance

July 9, 1996

Dear USA Team Member,

Precisely on time at 10:49 a.m. on June 20, the Space Shuttle Columbia lifted off following another nearly flawless countdown. The precision work by the USA Team is a testament to the professionalism of the outstanding work force we have. This is especially noteworthy considering the fact that this was our first launch as part of the United Space Alliance.

During the record setting 17-day Life and Microgravity Spacelab mission, STS-78 Commander Tom Henricks and his crew performed some 40 experiments to study the effects of long-duration space flight on human physiology. These studies will provide a baseline for work planned on the International Space Station.

For years, the KSC work force has been the greatest launch team in the world. I know the nation will be watching as we begin operating under the Space Flight Operations Contract and — in just over a year — when we begin the Space Station era.

Thanks for a great job.

Sincerely,

Mike McCulley

Mike McCulley
VP & Associate Program Manager
Ground Operations

National Aeronautics and
Space Administration

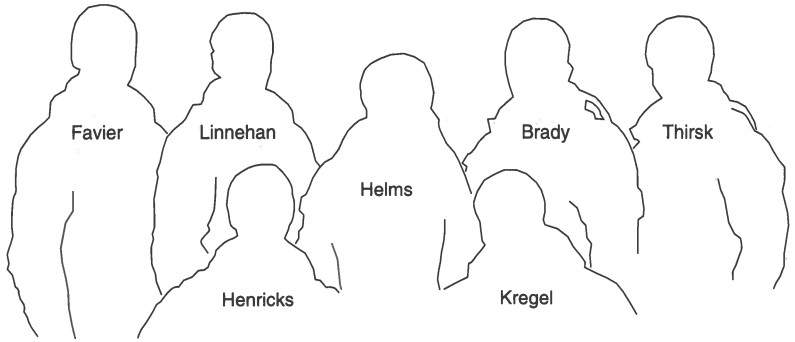
Crew of Space Shuttle
Mission STS-78

National Aeronautics and Space Administration

JSCCL-152

The Crew of Space Shuttle Mission STS-78

Commander
Terence T. Henricks (Colonel, USAF)
Tom Henricks was born in Bryan, Ohio, and was raised and educated in Woodville, Ohio. He received a B.S. degree in civil engineering from the U.S. Air Force Academy in 1974 and an M.S. degree in public administration from Golden Gate University in 1982. Upon graduation from the Air Force Academy, Henricks completed pilot training and flew F-4 fighter aircraft in England, Iceland, and the U.S. He is a graduate of the Air Force's Fighter Weapons and Test Pilot Schools. He was an F-16C test pilot prior to his selection as a NASA astronaut. Henricks has flown in space as pilot aboard STS-44 and STS-55, and as the commander of STS-70. He has spent nearly 26 days in space.



Pilot
Kevin R. Kregel
Kevin R. Kregel was raised and educated in Amityville, New York. He received a B.S. degree in astronautical engineering from the United States Air Force Academy and an M.S. in public administration from Troy State University. Kregel earned his pilot's wings at Williams Air Force Base, Arizona, and flew F-111 aircraft in England. Afterwards, he had an exchange tour with the U.S. Navy flying A-6E aircraft at Whidbey Island, Washington, and from the USS Kitty Hawk. Kregel made 66 carrier landings during a cruise of the western Pacific. He subsequently attended the U.S. Naval Test Pilot School and began flying the F-111, F-15, and the F-15E aircraft. Kregel has logged over 4,500 flight hours in 30 different aircraft. He was selected to be an astronaut by NASA in March 1992 and was the pilot of STS-70. He has logged over 214 hours (nearly 9 days) in space. STS-78 is Kregel's second Space Shuttle mission.

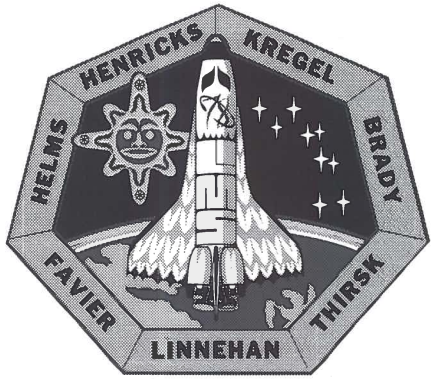
Payload Commander
Susan J. Helms (Lt. Colonel, USAF)
Susan Helms was born in Charlotte, North Carolina, and was raised and educated in Portland, Oregon. She earned a B.S. degree in aeronautical engineering from the U.S. Air Force Academy and an M.S. in aeronautics/astronautics from Stanford University. While at Eglin Air Force Base, Florida, she was an F-16 weapons separation engineer and later lead engineer for F-15 weapons separation. She was subsequently assigned to the faculty of the U.S. Air Force Academy where she held the position of assistant professor. Helms served as a U.S. Air Force exchange officer to the Aerospace Engineering Test Establishment, Canadian Forces Base, Cold Lake, Alberta, Canada, working as a flight-test engineer and project officer on CF-18 aircraft. She has flown in 30 different types of U.S. and Canadian aircraft. Helms was named an astronaut in 1990 and flew as a mission specialist on STS-54 and STS-64. Helms has logged over 406 hours (nearly 17 days) in space.

Mission Specialist
Richard M. Linnehan (DVM)
Born in Lowell, Massachusetts, Dr. Linnehan received a B.S. degree in animal sciences with a minor in microbiology from the University of New Hampshire and the degree of Doctor of Veterinary Medicine from Ohio State University College of Veterinary Medicine. After graduation, Dr. Linnehan entered private practice in small animal/exotic veterinary medicine and was later accepted to a 2-year joint internship in zoo animal medicine and comparative pathology at the Baltimore Zoo and Johns Hopkins University. After completing his internship, Dr. Linnehan was commissioned as a captain in the U.S. Army Veterinary Corps and was assigned to the Naval Ocean Systems Center (NOSC), San Diego, California, as chief clinical veterinarian for the U.S. Navy's Marine Mammal Project. During his assignment at NOSC, Dr. Linnehan initiated and supervised research in the areas of cetacean and pinniped anesthesia, orthopedics, drug pharmacokinetics, and reproduction in direct support of Naval mobile marine mammal systems stationed in California, Florida, and Hawaii. Dr. Linnehan was selected to be an astronaut by NASA in March 1992. STS-78 is his first Space Shuttle mission.

Mission Specialist
Charles E. Brady, Jr. (M.D., Commander, USN)
Dr. Charles E. Brady, Jr., was raised and educated in Robbins, North Carolina. He attended the University of North Carolina at Chapel Hill and received an M.D. degree from Duke University in Durham. From Duke, he went to the University of Tennessee Hospital in Knoxville for his internship and subsequently worked as the team physician in sports medicine for Iowa State University in Ames. He continued in sports medicine and family practice for the next seven years working as a team physician at the University of North Carolina at Chapel Hill and East Carolina University in Greenville, North Carolina. Brady joined the Navy and received training as a flight surgeon at the Naval Aerospace Medical Institute at the Naval Air Station Pensacola, Florida. In addition to serving as the flight surgeon for the "Blue Angels" Navy Flight Demonstration Squadron, Brady is the recipient of numerous medical awards. Brady was selected to be an astronaut by NASA in March 1992. STS-78 is his first Space Shuttle mission.

Payload Specialist (Centre National D'Etudes Spatiales, CNES)
Jean-Jacques Favier (Ph.D.)
Born in Kehl, Germany, Dr. Jean-Jacques Favier received an engineering degree from the National Polytechnical Institute of Grenoble. He earned two doctorate degrees, one in engineering from the Mining School of Paris and the other in metallurgy and physics from the University of Grenoble. In addition to owning several patents on crystal-growth processes, furnaces and in situ diagnosis, Dr. Favier has published more than 80 research articles in scientific journals and books. He is also the recipient of numerous academic awards. Dr. Favier is currently the Advisor to the Director of the Material Science Research Center at the French Atomic Energy Commission and is presently assigned to the French space agency (CNES). In addition to proposing the MEPHISTO program, a collaborative project between CNES and NASA, he has also developed numerous other scientific projects in collaboration with the United States. He has served as principal investigator for more than 10 space experiments conducted in collaboration with NASA, the European Space Agency (ESA), and the Russian Space Agency. STS-78 is Dr. Favier's first Space Shuttle mission.

Payload Specialist (Canadian Space Agency)
Robert B. Thirsk (M.D.)
Dr. Thirsk was born in British Columbia and received a B.Sc. degree in mechanical engineering from the University of Calgary and an S.M. degree in mechanical engineering from MIT. He later earned an MDCM from McGill University. Thirsk was selected as one of the six original members of the Canadian astronaut corps. As a career astronaut with the Canadian Space Agency (CSA), Thirsk pursues advanced astronaut training, research projects, payload engineering, clinical practice, and public liaison work. Thirsk also works on several space medicine, Space Station, and mission planning working groups. He served as alternate payload specialist for Shuttle Mission 41-G and as the CSA chief astronaut in 1993 and 1994. In 1995, Thirsk was selected to participate as a payload specialist on STS-78 which is his first Space Shuttle flight.



STS-78 Crew Patch

The STS-78 mission links past with present through a crew patch influenced by Pacific Northwest Native American art. Central to the design is the Space Shuttle Columbia whose shape evokes the image of the eagle, an icon of power and prestige and the national symbol of the United States. The eagle's feathers, representing both peace and friendship, symbolize the spirit of international unity on STS-78. An orbit surrounding the mission number recalls the traditional NASA emblem.

The Life Sciences and Microgravity Spacelab (LMS) is housed in Columbia's payload bay and is depicted in a manner reminiscent of totem art. The pulsating sun, a symbol of life, displays three crystals representing STS-78's three high-temperature microgravity materials processing facilities. The constellation Delphinus recalls the dolphin, friend of sea explorers, each star representing one member of STS-78's international crew including our alternate payload specialists: Pedro Duque and Luca Urbani.

The colored thrust rings at the base of Columbia signify the five continents of Earth united in global cooperation for the advancement of all humankind.

United Space Alliance

July 18, 1996

Dear Current and Future USA Team Members,

Each year, America celebrates Space Week. The period coincides with the week that Apollo 11 first took humans to the surface of the moon back in 1969. Space Week is also a time to look ahead to the task before us.

As we continue the transitions to United Space Alliance and the Space Flight Operations Contract, we are continuing with the business of today's space program and the upcoming Space Station era.

To help mark Space Day 1996, you are receiving mementos that will commemorate this event and help remind us of the important tasks we all face each day in preparing America's Space Shuttle fleet for safe and successful missions.

Keep up the great work!

Sincerely,

Mike McCulley
VP & Associate Program Manager
Ground Operations

USA

United Space Alliance

27 September, 1996

Dear USA Team Member,

The Space Shuttle Atlantis lit up the night sky at KSC on 16 September, lifting-off at exactly the scheduled time of 4:54 a.m. The launch team again performed in an extremely professional manner launching right at the opening of the short "window." This was noteworthy since the team had to deal with a few challenges that included two roll backs from the Pad to the VAB, due to the close brushes the Space Coast had with hurricanes Bertha and Fran.

The lift-off of Atlantis was good news for Shannon Lucid, who has broken numerous records during her stay aboard the Russian Space Station Mir. Her 188 days aloft shattered Astronaut Norm Thagard's 115-day record for an American and, on 7 September, Shannon also captured the longest single stay in space for a woman, breaking Cosmonaut Elena Kondakova's record of 169 days.

During Shannon's six months in space, she has performed experiments that will prove valuable as we plan for work aboard the International Space Station and longer space flights beyond Earth orbit.

In addition to the usual crew portrait and mission decal, to commemorate the historic international partnership between the United States and Russia, we are also enclosing a memento to honor the Shuttle-Mir program.

I'm proud of how the USA Ground Operations Team has supported this flight and preparations for upcoming missions, even in the midst of continuing transitions. Keep up the great work and thanks for an outstanding job.

Sincerely,

Mike McCulley

Mike McCulley
VP & Associate Program Manager,
Ground Operations

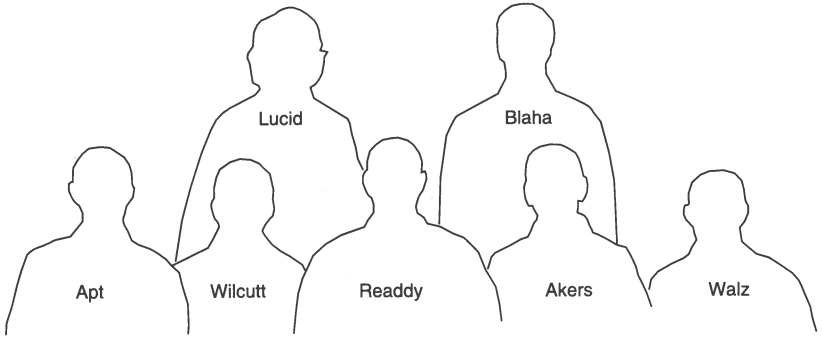
National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-79

National Aeronautics and Space Administration

JSCCL-152

The Crew of Space Shuttle Mission STS-79



Commander
William F. Readdy (Capt., USNR)
William Readdy was born in Quonset Point, Rhode Island. He earned a bachelor of science degree in aeronautical engineering in 1974 from the U.S. Naval Academy. Following designation as a naval aviator and training in the A-6 Intruder, he served aboard the USS Forrestal in the North Atlantic and Mediterranean. He was a "Distinguished Graduate" in the Class of '79 at the U.S. Naval Test Pilot School. After working as a test pilot at Patuxent River, Maryland, he served aboard the USS Coral Sea, flying A-6 and F/A-18 Hornet aircraft. He has logged over 6,500 hours of flying time in more than 60 types of fixed wing aircraft and helicopters, and made over 550 carrier landings. Selected as an astronaut candidate in 1987, Readdy is a veteran pilot astronaut of STS-42 and STS-51. STS-79 is his third Space Shuttle mission. He has logged 429 hours (20 days) of space flight.

Pilot
Terrence W. Wilcutt (Lt. Col., USMC)
Born in Russellville, Kentucky, Terrence W. Wilcutt received a B.A. degree in math from Western Kentucky University. After graduation from college, Wilcutt taught high school math for two years prior to entering the Marine Corps. After earning his wings, Wilcutt attended the Naval Fighter Weapons School (Topgun) and the U.S. Naval Test Pilot School where he was a "Distinguished Graduate." He was selected for F/A-18 conversion training and worked as an F/A-18 Fighter Weapons and Air Combat Maneuvering Instructor in VFA-125, Lemoore, California. He has accumulated over 3,000 flight hours in more than 30 different aircraft. Wilcutt served as pilot aboard STS-68, the Space Radar Lab-2 mission, during which he logged over 269 hours (11 days) in space. STS-79 is Wilcutt's second Space Shuttle mission.

Mission Specialist
Thomas D. Akers (Lt. Col., USAF)
Tom Akers was born in St. Louis, Missouri, and was raised and educated in his hometown of Eminence, Missouri. He received B.S. and M.S. degrees in applied mathematics from the University of Missouri at Rolla. He worked four years as the high school principal in Eminence before joining the Air Force. As a flight test engineer, he worked on several weapons development programs while flying F-4 and T-38 aircraft. Akers was named an astronaut in 1988 and served as a mission specialist aboard STS-41, STS-49, and STS-61. He has accrued over 571 hours (24 days) of space flight and over 29 hours of spacewalk experience.

Mission Specialist
Jerome (Jay) Apt (Ph.D.)
Jay Apt was born in Springfield, Massachusetts, and was raised and educated in Pittsburgh, Pennsylvania. He received a A.B. degree, magna cum laude, in physics from Harvard College and a doctorate in physics from the Massachusetts Institute of Technology. As a staff member of Harvard's Center for Earth and Planetary Physics, he supported NASA's Pioneer Venus Mission. While at NASA's Jet Propulsion Laboratory, Apt studied Venus, Mars, and the outer solar system and was Science Manager of the Table Mountain Observatory. From 1982 until his selection as an astronaut in 1985, he was a flight controller responsible for Shuttle payload operations at NASA's Johnson Space Center. He has logged over 3,000 hours flying time in some 30 different types of airplanes, sailplanes, and human-powered aircraft. Apt is a veteran of three Shuttle missions where he served as a mission specialist on STS-37, STS-47, and STS-59. Apt has logged approximately 604 hours (over 25 days) in space including 10 hours and 49 minutes on two spacewalks.

Mission Specialist
Carl E. Walz (Lt. Col., USAF)
Carl Walz was born in Cleveland, Ohio. He received a B.S. degree in physics from Kent State University and an M.S. degree in solid state physics from John Carroll University. While stationed at McClellan Air Force Base, California, he worked as a radiochemical project officer, responsible for analysis of radioactive samples from the Atomic Energy Detection System. As a flight test engineer at the F-16 Combined Test Force, Edwards Air Force Base, California, he worked on F-16C avionics and armament development programs, flying F-4 and F-16 aircraft. He also served as a flight test program manager at Detachment 3, Air Force Flight Test Center. Walz was selected by NASA to become an astronaut in 1990 and flew as a mission specialist on STS-51 and STS-65. Walz has logged over 590 hours (24.5 days) in space, including 7 hours 5 minutes during a spacewalk on STS-51.

Mission Specialist (NASA-Mir 3)
John E. Blaha (Col., USAF Ret.)
John Blaha was born in San Antonio, Texas. He received a B.S. degree in engineering science from the U.S. Air Force Academy and an M.S. degree in astronautical engineering from Purdue University. As an operational pilot, he flew F-4, F-102, F-106, and A-37 aircraft and completed 361 combat missions in Vietnam. As a test pilot he flew stability/control, performance, spin, and weapons delivery flight tests in the A-7, F-104, Jaguar, Buccaneer, Hawk, and Jet Provost aircraft. Blaha worked for the Assistant Chief of Staff, Studies and Analyses, at USAF Headquarters in the Pentagon, during which time he presented F-15 and F-16 study results to Department of Defense, State Department, and congressional staffs. He has logged 6,000 hours of flying time in 34 different aircraft and written numerous technical articles on spacecraft performance and control. Blaha was selected as an astronaut in 1980. He is a veteran of four Shuttle flights; as pilot of STS-33 and STS-29; as commander of STS-43 and STS-58. Blaha has accrued approximately 33 days in space. STS-79 is Blaha's fifth Space Shuttle flight. He will replace Shannon Lucid aboard the Mir Space Station for a planned 120 days.

Mission Specialist (NASA-Mir 2)
Shannon W. Lucid (Ph.D.)
Shannon Lucid was born in Shanghai, China, and grew up in Bethany, Oklahoma. She received a bachelor of science degree in chemistry from the University of Oklahoma in 1963, and a master of science and doctor of philosophy degrees in biochemistry from the University of Oklahoma in 1970 and 1973, respectively. Dr. Lucid's experience includes a variety of academic assignments, including work as a chemist at Kerr-McGee and research associate with the Oklahoma Medical Research Foundation, both in Oklahoma City. She is a commercial, instrument and multi-engine rated pilot. Since becoming an astronaut in 1979, she has served as Chief of the Mission Support Branch and Chief of Astronaut Appearances. A veteran of four space flights, Lucid served as a mission specialist aboard STS-51G, STS-34, STS-43, and STS-58. Dr. Lucid will return with the STS-79 crew aboard the Space Shuttle after spending 150 days aboard the Mir Space Station.

STS-79 Crew Patch

STS-79 is the fourth in a series of NASA docking missions to the Russian Mir Space Station, leading up to the construction and operation of the International Space Station (ISS). As the first flight of the Spacehab Double Module, STS-79 encompasses research, test and evaluation of ISS, as well as logistics resupply for the Mir Space Station.

STS-79 is also the first NASA-Mir American crew member exchange mission, with John Blaha (NASA-Mir 3) replacing Shannon Lucid (NASA-Mir 2) aboard the Mir Space Station. The lettering of their names either up or down denotes transport up to the Mir Station or return to Earth on STS-79.

The STS-79 patch is in the shape of the Space Shuttle's airlock hatch, symbolizing the gateway to international cooperation in space. The patch illustrates the historic cooperation between the United States and Russia in space. With the flags of Russia and the United States as a backdrop, the handshake of EVA-suited crew members symbolizes mission teamwork, not only of the crew members but also the teamwork between both countries' space personnel in science, engineering, medicine, and logistics.

United Space Alliance

Jim Adamson
Chief Operating Officer

1150 Gemini Avenue
Houston, TX 77058-2708
Telephone: 713.212.6120

February 18, 1997

To All USA Florida Employees:

The Space Shuttle Columbia returned to Florida on December 7, 1996, successfully completing the STS-80 mission and setting a new record for the longest flight of the program.

I'm very proud of the excellent work the entire Ground Operations team in Florida performed in preparing Columbia for this complex mission. The primary payloads, the Wake Shield Facility and the German Orbiting Retrievable Far and Extreme Ultraviolet Spectrometer-Shuttle Pallet Satellite, were successfully deployed and retrieved, marking the first time that a crew has simultaneously deployed two retrievable payloads.

The entire USA team can take special pride in the fact that the STS-80 mission marked the first Space Shuttle flight that USA processed and launched under the Space Flight Operations Contract. I would like to extend my personal congratulations to all of you for your outstanding efforts.

To commemorate the mission, please find enclosed the STS-80 mission cards, mission decal and crew litho. Thanks for an outstanding job and keep up the excellent work.

Jim Adamson
Chief Operating Officer
United Space Alliance

National Aeronautics and
Space Administration

Crew of Space Shuttle
Mission STS-80

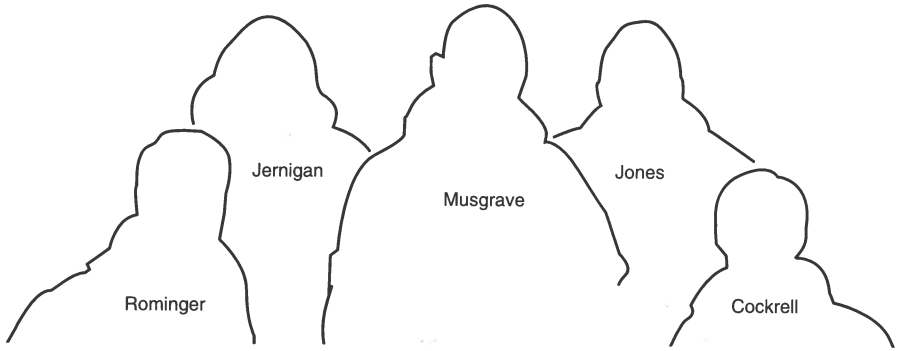
National Aeronautics and Space Administration

JSCCL-153

The Crew of Space Shuttle Mission STS-80

Commander
Kenneth D. Cockrell
Kenneth Cockrell was born in Austin, Texas. He received a B.S. degree in mechanical engineering from the University of Texas and an M.S. degree in aeronautical systems from the University of West Florida. After designation as a Naval Aviator, he flew the A-7 Corsair II aboard the USS Midway in the Western Pacific and Indian Oceans. Following graduation from the U.S. Naval Test Pilot School in Maryland, he conducted flight tests on the A-4, A-7, F-4, and F/A-18 aircraft. He was assigned as a pilot in an operational F/A-18 squadron and made two cruises on the USS Constellation. Cockrell resigned his commission to work as a research pilot at NASA's Johnson Space Center. Selected as a pilot astronaut in 1990, he has logged over 6,400 flying hours and 650 carrier landings. Cockrell flew as a mission specialist on STS-56 and was the pilot on STS-69. He has logged over 20 days in space.

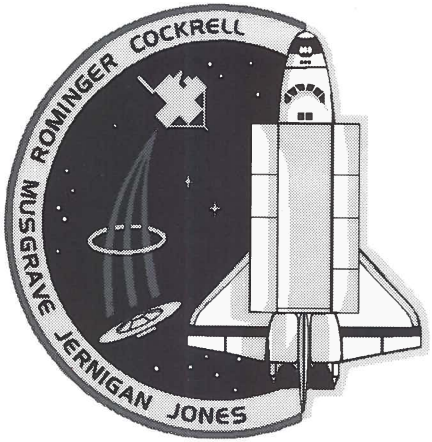
Pilot
Kent V. Rominger (CDR, USN)
Kent V. Rominger was born in Del Norte, Colorado. He received a B.S. degree in civil engineering from Colorado State University and an M.S. degree in aeronautical engineering from the U.S. Naval Postgraduate School. Rominger flew F-14's aboard the USS Ranger and USS Kitty Hawk following flight training. After graduation from the U.S. Naval Test Pilot School, he completed the initial carrier suitability sea trails of the F-14B, logging the first aircraft carrier arrestment and catapult launch in the upgraded Tomcat. In September 1990, he reported to Fighter Squadron Two Hundred Eleven (VF-211) where he served as Operations Officer and completed a Desert Storm deployment to the Arabian Gulf aboard the USS Nimitz. Rominger has logged over 4,200 flying hours in over 35 types of aircraft and completed 685 carrier landings. Kent Rominger served as pilot aboard the Space Shuttle Columbia on STS-73 and spent more than 15 days in space. STS-80 is Rominger's second Space Shuttle flight.



Mission Specialist
Tamara E. Jernigan (Ph.D.)
Tamara Jernigan was born in Chattanooga, Tennessee. She received a B.S. degree in physics (with honors), an M.S. degree in engineering science from Stanford University, an M.S. degree in astronomy from the University of California-Berkeley, and a Ph.D. in space physics and astronomy from Rice University. She worked in the Theoretical Studies Branch at NASA's Ames Research Center, conducting studies of bipolar outflows in the regions of star formation, gamma ray bursters, and shock-wave phenomena in the interstellar system. Dr. Jernigan was named an astronaut in 1985. Her assignments have included software verification in the Shuttle Avionics Integration Laboratory and spacecraft communicator (CAPCOM) in Mission Control for STS-30, STS-28, STS-34, STS-33, and STS-32. She also served as lead astronaut for flight software development, as Chief of the Astronaut Office Mission Development Branch, and as Deputy Chief of the Astronaut Office. Dr. Jernigan flew as a mission specialist aboard STS-40, STS-52, and as payload commander on STS-67. She has spent over 35 days in space.

Mission Specialist
Thomas D. Jones (Ph.D.)
Thomas David Jones was born in 1955 in Baltimore, Maryland. He earned a B.S. degree in basic sciences from the U.S. Air Force Academy and a Ph.D. in planetary sciences from the University of Arizona. As an Air Force officer, he served as a B-52 strategic bomber pilot and commanded a 6-man combat crew. After leaving the military, Jones focused his doctoral research on remote sensing of the compositions of asteroids and meteorites, and the utility of asteroid resources in space exploration. He was a program management engineer for the CIA's Office of Development and Engineering and later a senior scientist at Science Applications International Corporation, analyzing future missions to Mars, asteroids, and the outer solar system. He was selected as an astronaut by NASA in 1990. Dr. Jones has two space flights to his credit, STS-59 and STS-68, both 1994 flights of the Space Radar Lab (SRL). Dr. Jones was the payload commander for SRL-2 on STS-68. He has logged over 22 days in space.

Mission Specialist
F. Story Musgrave (M.D.)
Story Musgrave was born in Boston, Massachusetts, and grew up in Lexington, Kentucky. Musgrave joined the U.S. Marine Corps and served as an aviation electrician, instrument technician, and aircraft crew chief. He later enrolled at Syracuse University and earned a B.S. degree in mathematics and statistics. At the University of California at Los Angeles, he earned an M.B.A. degree in operations analysis and computer programming. He also earned a B.A. degree in chemistry from Marietta College and an M.D. degree in medicine from Columbia University. At the University of Kentucky, Musgrave received an M.S. degree in physiology and biophysics, and at the University of Houston he received an M.A. degree in literature. He did his surgical internship at the University of Kentucky Medical Center and conducted research in aerospace medicine. Musgrave has earned U.S. Air Force wings and several FAA ratings, including airline transport pilot, and is an accomplished parachutist. He has flown more than 17,000 hours in 160 types of aircraft. Musgrave became a NASA scientist-astronaut in 1967. He was a backup science-pilot for the first Skylab mission and has flown in space five times: as a mission specialist on STS-6, STS-51F, STS-33, STS-44, and as the payload commander on STS-61. He has logged over 35 days in space.



STS-80 Crew Patch

The STS-80 mission patch depicts Space Shuttle Columbia and the two research satellites its crew will deploy into the blue field of space. The uppermost satellite is ORFEUS-SPAS (Orbiting Retrievable Far and Extreme Ultraviolet Spectrograph-Shuttle Pallet Satellite), a telescope aimed at unraveling the life cycles of stars and understanding the gases that drift between them. The lower satellite is the Wake Shield Facility, flying for the third time. It will use the vacuum of space to create advanced semiconductors for the nation's electronics industry. ORFEUS and Wake Shield are joined by the symbol of the Astronaut Corps, representing the human contribution to scientific progress in space. The two bright blue stars represent the mission's spacewalks, final rehearsals for techniques and tools to be used in assembly of the International Space Station. Surrounding Columbia is a constellation of 16 stars, one for each day of the mission, representing the stellar talents of the ground and flight team that share the goal of expanding knowledge through a permanent human presence in space.

NASA National Aeronautics and Space Administration

Crew of Space Shuttle
Mission 51-L

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Space Shuttle Orbiter Crew Members for 51-L

The seven members of the Space Shuttle 51-L flight are: (back row, left to right) Mission Specialist El Onizuka, Teacher in Space Participant, S. Christa McAuliffe, Payload Specialist Greg Jarvis, and Mission Specialist Judy Resnik; (front row, left to right) Pilot Mike Smith, Commander Dick Scobee, and Mission Specialist Ron McNair.