



JOHN F. KENNEDY SPACE CENTER

January 5, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 1-98



KENNETH PAYNE NAMED KSC LOGISTICS OPERATIONS DIRECTOR

Kenneth Payne, a veteran leader in the field of acquisition and logistics management, is being named director of Logistics Operations at the Kennedy Space Center, effective Feb. 1, 1998 by Center Director Roy Bridges.

"I am very pleased that Ken Payne is joining our KSC staff," said Bridges. "He is a man with world-class credentials in leading change in large, high technology acquisition and logistics organizations."

Payne's responsibilities as Logistics Operations director will include management of the contract for Space Shuttle orbiter flight hardware spares, repairs, and all the associated planning and management of the supply vendor infrastructure. He also will oversee technical management of logistics functions of repair and spares for all launch processing ground systems and facilities for both Shuttle and payloads processing, as well as Center support. Other responsibilities include management of all Center logistics functions such as supply, transportation, equipment management, property disposal, and associated technical training.

"I believe Ken has the right experience, energy and vision to lead our logistics organization into the 21st Century. We have opportunities to contribute more to NASA in this area. Ken, with the support of a great team at KSC, will make things happen," said Bridges.

Payne, a member of the Senior Executive Service, currently serves as deputy director of Requirements, Headquarters Air Force Materiel Command, Wright-Patterson Air Force Base, Ohio. The directorate is the command focal point for program and product management policy, processes and resources.

Bridges said, "Ken Payne played a key role in the F-16 and C-17 program offices and the Headquarters during a time of massive change in the Air Force. His units excelled during this period."

Payne began his federal civilian career in 1972 following graduation from Georgia State University, joining the Defense Contract Administration Services District in Alabama as an analyst. After a period of service with the Defense Logistics Agency, Payne moved to the Air Force in 1987, where he took on assignments of increasing responsibility, including deputy director, Plans and Programs for the Ogden Air Logistics Center; deputy and then acting F-16 system support manager; and deputy system program director for the F-16 and C-17 programs. He is a former Army Infantry Officer with combat experience in

Vietnam.

Payne is a certified Acquisition Program Manager and Logistician who has managed major aerospace/aeronautical programs through their life cycle. He played a key leadership role in the effort to reform and streamline the Air Force acquisition and logistics process. He also is familiar with programs that have international involvement, having worked on such multinational efforts as the F-16 aircraft program.

His educational background includes a bachelor's degree of Business Administration in Management from Georgia State University, 1972; a master's degree in Public Administration, George Washington University, 1976; and studies at the Armed Forces Staff College, 1977; Harvard University Graduate School of Business, 1990, and Defense Systems Management College, 1991.

Payne and his wife, Jody, are originally from Wisconsin. They have two children, a son and a daughter.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 8, 1998

KSC Contact: Patti Phelps

KSC Release No. 2-98



ELEVEN KSC WORKERS HONORED BY NASA ASTRONAUTS

Eleven NASA/KSC employees month were presented last month with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

On Dec. 4, astronauts Pat Forrester and Mark Polansky presented awards to Bennie A. Bell of the Public Affairs Office; Helen D. "Cindy" Coddington and Edward M. Markowski of the Shuttle Processing Directorate; Stacie L. Grega and Enoch Moser of the Payload Processing Directorate; and Shawn M. Quinn of the Engineering Development Directorate.

On Dec. 16, astronaut Polansky gave awards to Cheryl A. Malloy, Freddie R. Head and Ira L. Kight of the Payload Processing Directorate; and Robert Saulnier and Stephen C. Coffman of the Safety and Mission Assurance Directorate.

Bennie A. Bell of Merritt Island was commended for "the exceptional manner" in which she manages the KSC Speakers Bureau. Helen D. "Cindy" Coddington of Rockledge was applauded for her role as "an ambassador for human space flight for NASA and the Center" and her work in outreach programs for area youth, particularly in coordinating a program to host U.S. Naval Academy midshipmen as interns at KSC. Edward M. Markowski of Palm Bay was congratulated for working beyond normal job requirements as an administrative specialist and training coordinator, and for his "can do attitude" that has resulted in not one instance of a KSC employee being denied access to a work area because of improper training or certification.

Stacie L. Grega of Cocoa was recognized for "many significant contributions" she has made as an administrative and information specialist, particularly in the development of an Administrative Office Home Page on the World Wide Web and support of the Space Flight Awareness (SFA) Program as a member of the KSC SFA Council. Enoch Moser of Merritt Island was commended for his "dedication and significant contributions" to Spacelab experiment integration at Kennedy Space Center since the initial Spacelab-1 mission.

Shawn M. Quinn of Titusville was applauded for his work as a computer engineer and his instrumental role in improving the Shuttle checkout and launch process, especially in leading the effort to provide the Space Shuttle ICE Team with an automated capability to perform external tank surface ice calculations.

Cheryl A. Malloy of Merritt Island was recognized for "significantly contributing" to the transfer of the Partial Payload Checkout Unit from the Operations and Checkout Building to the Space Station Processing Facility, on a tight schedule and without affecting the

processing schedule of the United States Microgravity Payload-4. Freddie R. Head of Melbourne was congratulated on his efforts to keep the Test, Control and Monitoring System project for space station processing "on a successful path during very turbulent times." Ira L. Kight of Mims was applauded for his leadership in the development of space station-to-Shuttle processes for the evolution of new ground support equipment as well as for Shuttle facility modifications.

Robert Saulnier of New Smyrna Beach was commended for his "keen eye and instincts" in preventing possible hardware damage caused by improper installation of a foot restraint in the mid-body of the Space Shuttle, as well as for his discovery of broken wires on a wiring harness. Stephen C. Coffman of Titusville was recognized for his "significant contributions" in the development of the KSC Vendor Quality Network.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 8, 1998

KSC Contact: Patti Phelps

KSC Release No. 3-98



JEFFREY S. JOHNSON HONORED BY NASA ASTRONAUTS

Jeffrey S. Johnson, a 1976 graduate of Forest High School, Ocala, FL, and son of Roy and Martha Johnson of Ocala, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Born in Vernon, AL, Johnson received a bachelor's degree in aeronautics in 1991 from Embry-Riddle Aeronautical University, Daytona Beach, FL.

Johnson lives in Titusville, FL. He and his wife, the former Laura Howe, grew up in Ocala and attended local schools. Her parents, Ed and Betty Howe, also live in Ocala. The Johnsons have two children, Chris and Andrew.

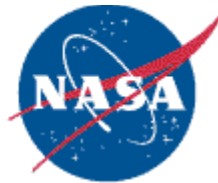
Astronaut Mark Polansky presented the award to Johnson on Dec. 4 at KSC. Johnson is manager of the Rocketdyne Technical Operations group for Boeing North American, Rocketdyne, which processes Space Shuttle main engines (SSME) for flight. He joined the space center in 1986.

Johnson was congratulated on being "one of the most versatile performers on the Rocketdyne team," according to astronaut Polansky. "Your attention to detail and drive to 'go the extra mile' on any given assignment makes you a valuable member of the KSC team."

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

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Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 8, 1998

KSC Contact: Patti Phelps

KSC Release No. 4-98



JEFFREY W. KIRCHEL HONORED BY NASA ASTRONAUTS

Jeffrey W. Kirchel, a 1980 graduate of Blackhawk High School, Beaver Falls, PA, and a 1986 graduate of Temple University in Pennsylvania, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Born in New Brighton, PA, Kirchel received a bachelor of science degree in electrical engineering from Temple University. He also attended Pennsylvania State University. His parents, Mr. And Mrs. Walter Kirchel, live in Merritt Island, FL.

Jeffrey Kirchel also lives in Merritt Island, FL.

Astronaut Mark Polansky presented the award to Kirchel on Dec. 4 at KSC. Kirchel is a quality engineer with Boeing North American, Rocketdyne, which processes Space Shuttle main engines (SSME) for flight. He joined the space center in 1990 and his work has been recognized with a Rocketdyne Leadership Award and numerous Group Achievement Awards.

He was commended for repeatedly demonstrating his commitment, dedication and willingness to get the job done over the past seven years. "This has never been more evident than in your outstanding effort in the development and implementation of the Rocketdyne Integrated Quality System (IQS)," astronaut Polansky told him. "The IQS system has been recognized by NASA/Marshall Space Flight Center and NASA Headquarters as a key initiative to increase quality while increasing efficiency and reducing cost."

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 8, 1998

KSC Contact: Patti Phelps

KSC Release No. 5-98



ROBERT E. SAULNIER HONORED BY NASA ASTRONAUTS

Robert E. Saulnier, a resident of New Smyrna Beach, FL, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Astronaut Mark Polansky presented the award to Saulnier on Dec. 4 at Kennedy Space Center. Saulnier is employed by NASA as a quality assurance specialist. He joined the space center in 1989.

Saulnier was commended for his "keen eye and instincts" in preventing possible hardware damage caused by improper installation of a foot restraint in the mid-body of the Space Shuttle, as well as for his discovery of broken wires on a wiring harness. "We are fortunate to have such a highly motivated and quality conscious individual representing NASA quality," astronaut Polansky told him.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

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Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 8, 1998

KSC Contact: Patti Phelps

KSC Release No. 6-98



STEPHEN COFFMAN HONORED BY NASA ASTRONAUTS

Stephen Coffman, a 1967 graduate of Frankfort Senior High School, Frankfort, IN, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Astronaut Mark Polansky presented the award to Coffman on Dec. 16 at Kennedy Space Center (KSC). Coffman is employed by NASA at KSC as a senior procurement quality representative. He joined the space center in 1978.

Coffman was applauded for his significant contributions in the development of the KSC Vendor Quality Network. "Your efforts will increase the efficiency of the NASA Vendor Quality Division and allow substantial cost savings to the Agency for many years," astronaut Polansky told him. "Your experience, initiative and willingness in devoting long hours to this program are to be commended."

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

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Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 6, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 7-98



Note to Editors:

MEDIA OPPORTUNITY WITH STS-89 CREW SET FOR THIS WEEK'S TCDT

The crew of Space Shuttle mission STS-89 will be at Kennedy Space Center this week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held at KSC prior to each Space Shuttle flight providing the crew of each mission opportunities to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cut-off. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The seven-member crew of mission STS-89 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 7 p.m. Wednesday, Jan. 7. No photo opportunity is scheduled for this event.

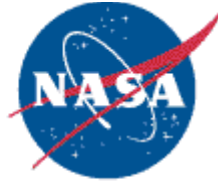
On Friday, Jan. 9, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39A. Media interested in participating in this question and answer session should be at the KSC Press Site by 8:30 a.m. Friday for transport to the pad. This question and answer event will be carried live on NASA TV.

On Saturday, the crew will take part in simulated launch day events. At the pad, the crew will enter the orbiter Endeavour fully suited for the simulated Shuttle main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Endeavour is targeted for launch on Jan. 22 at 9:48 p.m. EST. Mission STS-89 will be the first mission of 1998 and become the eighth to dock with Russia's Mir Space Station. The mission is scheduled to last nine days.

Crew members for mission STS-89 are: Commander Terrence Wilcutt; Pilot Joe Edwards; and Mission Specialists Jim Reilly, Mike Anderson, Bonnie Dunbar, Salizhan Sharipov and Andy Thomas. Thomas will remain on Mir and Mission Specialist Dave Wolf will return with the rest of the Endeavour crew.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 7, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 8-98



ENDEAVOUR LAUNCH TO MIR SET FOR JAN. 22 / STS-89 & MIR BACKGROUND PRESS BRIEFINGS NEXT WEEK

The night of Jan. 22 was selected today by Space Shuttle Program managers as the launch date for the first flight of 1998 and the eighth to rendezvous and dock with Russia's Mir Space Station.

A series of background press briefings on the STS-89 mission are scheduled beginning at 9 a.m. EST, Jan. 13 on NASA TV. A Mir EVA activities briefing and Lunar Prospector briefing also will be part of the lineup on Jan. 13. A list of the briefings, times and participants is attached.

STS-89 mission objectives include replacing astronaut Dr. David Wolf with Andy Thomas who will be the next U.S. crew member on the station as part of the Phase One Program. During the mission, more than 7,000 pounds of experiments, supplies and hardware are scheduled to be transferred between the two spacecraft. Wolf will return home following four months on Mir.

The preferred launch window opportunity opens at approximately 9:48 p.m. EST and closes about 5 minutes later. Following a nominal flight duration of 8 days, 19 hours, 48 minutes, Endeavour is scheduled to land at the Kennedy Space Center, Florida at about 5:36 p.m. EST, Jan. 31.

Today's launch date decision follows the traditional face-to-face Flight Readiness Review at KSC by shuttle managers from NASA and prime contractor United Space Alliance.

"The team is ready to put Endeavour back into space after a year and half of undergoing important modifications and upgrades," said George Abbey, Director of the Johnson Space Center, who chaired the review. "The work that has been done in getting this vehicle ready to fly is attributable to a real team effort across the program."

STS-89 will be Endeavour's 12th mission into space and the 89th shuttle flight in the program's history.

- end -

PLEASE NOTE: Following the STS-89 mission briefings, individual round-robin interviews with the STS-89 astronauts will be held for reporters at JSC and for those who make special arrangements in advance to conduct the interviews by phone. Reporters interested in round-robin interviews with the STS-89 astronauts should fax a letter of interest to Eileen Hawley in JSC Public Affairs by close of business on Jan. 9. The fax

number for the JSC Public Affairs office is 281/483-2000. The round-robin interviews will not be seen on NASA TV.

STS-89 PRE-FLIGHT BRIEFINGS

Tuesday, January 13, 1998

(All times shown are EST)

9:00 a.m. -- Mission Overview

Phil Engelauf, STS-89 Lead Flight Director

10:00 a.m. -- Mir 24 Pre-EVA Activities Briefing

Frank Culbertson, Director, Shuttle-Mir Phase One Program

Greg Harbaugh, Acting Manager, EVA Projects Office

10:45 a.m. -- Phase One Overview

Frank Culbertson, Director, Shuttle-Mir Phase One Program

Valery Ryumin, Director, RSC Energia, Phase One Program

John Uri, Shuttle-Mir Mission Scientist

12 noon -- Lunar Prospector Press Conference

1:00 p.m. -- Spacehab Briefing

Mike Bain, Shuttle-Mir Program Manager, Spacehab

1:30 p.m. -- Astroculture/X-ray Detector Test/MGM experiment Briefing

Joel Kearns, Microgravity Research Program Manager, MSFC

Dr. Daniel Carter, New Century Pharmaceuticals

Dr. Raymond Bula, University of Wisconsin

Buddy Guynes, Project Manager, MGM experiment

2:30 p.m. -- STS-89 CREW PRESS CONFERENCE

Terrence Wilcutt, Mission Commander

Joe Edwards, Pilot

Jim Reilly, Mission Specialist-1

Mike Anderson, Mission Specialist-2

Bonnie Dunbar, Payload Commander /Mission Specialist-3

Salizhan Sharipov, Mission Specialist-4

Andy Thomas, Mission Specialist 5

3:30 p.m. -- STS-89 Crew Round Robins

Note: The round robin interview event with the STS-89 crew is a local JSC event only and will not be carried on NASA TV.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 12, 1998

KSC Contact: Carol Cavanaugh

KSC Release No. 9-98



NEW KSC TOUR ATTRACTIONS BRING VISITORS CLOSER TO SHUTTLE LAUNCH OPERATIONS AND INTERNATIONAL SPACE STATION PREPARATIONS

While other Florida attractions focus on fantasy, the Kennedy Space Center (KSC) Visitor Complex zeroes in on the real thing. No papier-mâché rockets or cartoon characters here. This is the real stuff: The home base for the U.S. Space Shuttle, and the workers who prepare flight hardware and payloads for launch into orbit. Two new tour destinations opening Jan. 16 at KSC will draw visitors into the heart of Shuttle launch operations and offer a close-up look at preparations for on-orbit construction of the International Space Station.

The new attractions represent the second phase of a comprehensive effort to make the American space program as accessible as possible to members of the general public visiting KSC. Located in the Launch Complex (LC) 39 area - where the Space Shuttle is prepared for flight and launched - is the LC 39 Observation Gantry. The other new tour destination is called the International Space Station Center (ISSC). It is located adjacent to the Space Station Processing Facility, in the KSC Industrial Area.

"These new destinations, along with the Apollo/Saturn V Center, give the visitor unprecedented access to the U.S. space program and Kennedy Space Center," said James Ball, chief of the NASA Public Services Office at KSC. "Now, instead of a tour largely limited to driving around our facilities, the visitor can spend as much of their day as they wish in the heart of our operational sites, getting an up-close and personal view of both history and the future."

The 60-foot-tall LC 39 Observation Gantry features a top-level observation deck with a surrounding open-air walkway. From here, visitors have a 360-degree panoramic view of KSC's Launch Complex 39, which includes the two launch pads originally constructed to support the Apollo lunar landing program in the 1960s and now serving as the springboard from which the Space Shuttle soars into space; the massive Vehicle Assembly Building which first housed the mighty Saturn V rocket for Apollo and is now the focal point for Shuttle assembly; and the crawlerway, a vast swath the width of an eight-lane highway upon which completed launch vehicles are transported to the pads.

In addition to unparalleled views, the LC 39 Observation Gantry offers several other experiences to pull the visitor into the midst of the Shuttle program. Shuttle astronaut Marsha Ivins appears in a film presentation to explain how a Shuttle is prepared for launch. An exhibit gallery highlights components of the Shuttle and the launch facilities, including a sample of the protective tile that shields the orbiter from the extremes of space

and re-entry, and an actual Shuttle main engine suspended between two floors. Also located here is the Shuttle Science Research Station which features two interactive exhibits. Visitors can use touch-screens to gather information about the Shuttle program, provided by actual KSC personnel.

The International Space Station Center also is designed to make visitors feel like participants rather than remote observers in America's space program. The ISSC experience begins with a film hosted by Robert Cabana, commander of the first U.S. assembly flight set to occur in July 1998. Cabana talks about the purpose of the station and the challenges of designing and constructing such a mammoth research laboratory. Full-scale mockups of station modules, through which visitors can walk, are on display. These include the Habitation Unit, where station crew members will live, sleep and work, a Laboratory Module, and the Pressurized Logistics Module, where racks and supplies will be transported back and forth from KSC to space. Also on display is a mockup of Node 1, the first piece of U.S. hardware to be flown into space, which will serve as a connector between U.S. and Russian elements of the station. Guests can then take an elevated walkway to a gallery overlooking the work area where actual International Space Station hardware is being prepared for flight into space by members of the KSC team.

Visitors will have the opportunity to see the new attractions as part of an individualized tour of KSC that begins at the KSC Visitor Complex. Rather than having to take a preset tour that follows a specific program, visitors may choose which locations they would like to see and how long they wish to stay. Bus transportation to and from the stops and the KSC Visitor Complex is provided on a frequent basis to tour guests, and beverages and refreshments are available at each location.

"There are very few places you can visit and see real flight hardware being prepared for launch," said Rick Abramson, president and chief operating officer of Delaware North Parks Services of Spaceport Inc., which operates the Kennedy Space Center Visitor Complex under a concession agreement with NASA. "This is the real stuff being assembled by people with the right stuff. In a day's visit, visitors can experience the past, present and future of the U.S. space program, its challenges and successes. It's an experience not to be missed."

The new sites, which join the popular Apollo/Saturn V Center that opened in December 1996, are part of a comprehensive effort by NASA and Delaware North to expand and improve the KSC public tour and visitor facilities. Attendance at the attraction continues to increase. In December, the Visitor Complex hosted approximately 200,000 guests, a record number. The KSC attraction is the fifth most popular tourist destination in Florida and one of the most affordable, with bus tours costing a nominal \$14 per person.

Go to the [KSC Press Releases](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

January 12, 1998

KSC Contact: Joel Wells

KSC Release No. 10-98



Note to Editors/News Directors:

JAN. 16 RIBBON-CUTTING WILL INAUGURATE TWO NEW KSC TOUR ATTRACTIONS

News media are invited to attend the Jan. 16 ceremony marking the official opening of two new tour attractions at the Kennedy Space Center: the International Space Station Center and the Launch Complex 39 Observation Gantry.

The ceremony, scheduled for 11 a.m., Friday, Jan. 16, will be held at the International Space Station Center located adjacent to the Space Station Processing Facility in the KSC Industrial Area. News media wishing to attend the ceremony must be at the KSC Press Site by 10:00 a.m. for transport to the International Space Station Center.

KSC Director Roy D. Bridges Jr. and astronaut John E. Blaha will participate in the ribbon-cutting ceremony. Blaha flew aboard the Russian Space Station Mir for four months last year. Also scheduled to participate in the event are Hugh Harris, director, NASA Public Affairs, KSC; James Ball, chief, NASA Public Services, KSC; and Rick Abramson, president and chief operating officer, Delaware North Parks Services of Spaceport Inc.

Following the ceremony, news media will have the opportunity to experience the new tour attractions. Transportation will be provided to bring news media to the Launch Complex 39 Observation Gantry as well as back to the Press Site.

Delaware North Parks Services of Spaceport Inc. operates the KSC Visitor Complex under a concession agreement with NASA. No appropriated funds were used in connection with the new tour destinations.

SPACE STATION COMPONENT MEDIA OPPORTUNITY IMMEDIATELY FOLLOWS

Immediately following the ribbon-cutting ceremony, there will be a media opportunity to view the Photovoltaic Module 1 Integrated Equipment Assembly (IEA) at the Space Station Processing Facility.

The IEA is one of four integral units designed to generate, store and distribute power for the International Space Station. The first IEA is scheduled to be launched on Mission STS-97, currently slated for April 1999.

Spokespersons available to answer questions and for interviews will be:

- Brewster Shaw, Boeing Vice President, Space Station Electrical Power Systems
- Steve Francois, Manager, Space Station Processing, NASA-KSC
- Tip Talone, Director, Space Station Hardware Integration Office, NASA-KSC
- Felix Joe, STS-97 Payload Manager, NASA-KSC
- Michael Kinslow, STS-97 Payload Manager, Boeing-KSC
- Ron Torcivia, Launch Package Manager, NASA-Johnson Space Center

Media representatives are reminded that they must wear long pants and flat closed-toe shoes. No lighters or matches, pocket knives, food or drink are allowed inside the Space Station Processing Facility high bay.

Press representatives needing accreditation should contact the KSC News Center at 407/867-2468 prior to the close of business on Thursday, Jan. 15.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 9, 1998

KSC Contact: Patti Phelps

KSC Release No. 11-98



BENNIE A. BELL HONORED BY NASA ASTRONAUTS

Bennie A. Bell, a longtime resident of Huntsville, AL, and a 1957 graduate of Butler High School, Huntsville, AL, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Born in Gadsden, AL, Bell received an associate's degree in business from North Alabama State College, Huntsville, AL, in 1959. She is the daughter of James B. and Marie Ray Anderson of Lewisburg, TN.

Bell and her husband, John H. Bell, a retired NASA engineer, live in Merritt Island, FL. They have three daughters and three grandchildren.

Astronaut Pat Forrester presented the award to Bell on Dec. 4 at Kennedy Space Center. Bell was commended for the "exceptional manner" in which she manages the KSC Speakers Bureau.

"You are extremely effective in balancing the time constraints of speakers with the needs of the requesting organizations and, as a result, you are universally respected for both your sensitivity and professionalism," astronaut Forrester told her. "Thanks to your tireless dedication, public awareness and understanding of NASA's mission are enhanced."

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

Go to the [KSC Press Releases](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

January 15, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 13-98



Notice to Editors/News Directors:

MISSION STS-89 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Jan. 22 launch of the Space Shuttle Endeavour on Mission STS-89, the 89th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted. Please refer to the STS-89 NASA TV schedule for exact times.

The seven STS-89 crew members are scheduled to arrive at KSC on Monday, Jan. 19, at about 3:30 p.m. EST. News media representatives wishing to cover the event must be at the News Center by 2:30 p.m. Monday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the KSC News Center at 867-2468 before close of business Friday, Jan. 16, to make arrangements.

News media representatives with proper authorization may obtain STS-89 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at: <http://www.ksc.nasa.gov/shuttle/countdown/> and at <http://shuttle.nasa.gov/>

KSC press releases and other information are available on the KSC PAO Home Page at: <http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm>

STS-89 BRIEFING & EVENTS SCHEDULE *(all times are EST)*

(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Monday, Jan. 19

No Countdown Status Briefing is scheduled

STS-89 Flight Crew Arrival (Live on NASA TV) ----- 3:30 p.m.

(Launch countdown begins at 7 p.m.)

L-2 Days - Tuesday, Jan. 20

Countdown Status Briefing ----- 9 a.m.

- John Guidi, Shuttle Test Director
- Todd Corey, STS-89 Payload Manager
- Ed Priselac, Shuttle Weather Officer

L-1 Day - Wednesday, Jan. 21

Countdown Status Briefing ----- 9 a.m.

- Jeff Spaulding, Shuttle Test Director
- Todd Corey, STS-89 Payload Manager
- Ed Priselac, Shuttle Weather Officer

Pre-launch News Conference ----- 1:30 p.m.

- Tommy Holloway, Shuttle Program Manager, JSC
- Frank Culbertson, Phase I Shuttle-Mir Program Director
- Valery Ryumin, Russian Mir-Shuttle Program Director
- General Yuri Glazkov, Deputy Director Gagarin Cosmonaut Training Center
- Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
- Capt. Dave Biggar, Launch Weather Officer, USAF 45th Weather Squadron

Launch Day - Thursday, Jan. 22

Countdown Status Briefing ----- 9 a.m.

- Doug Lyons, NASA Test Director
- Ed Priselac, Shuttle Weather Officer

(Tanking begins at about 12:50 p.m.)

NASA Television live launch programming begins ----- 4:30 p.m.

Launch of Endeavour ----- 9:48 p.m.

Post-launch Press Conference ----- Launch + 1 hour

- Donald R. McMonagle, Manager, Launch Integration for the Space Shuttle Program
- Dave King, KSC Launch Director

KSC News Center office hours for STS-89

(hours may be adjusted for in-flight events)

Monday, Jan. 19-----	(Launch minus 3 days)-----	11 a.m. - 7 p.m.
Tuesday, Jan. 20-----	(Launch minus 2 days)-----	8 a.m. - 4:30 p.m.
Wednesday, Jan. 21-----	(Launch minus 1 day)-----	8 a.m. - 7 p.m.
Thursday, Jan. 22-----	(Launch) Flight day 1-----	8 a.m. - 2 a.m. (Friday)
Friday, Jan. 23-----	Flight day 2-----	8 a.m. - 4:30 p.m.
Saturday, Jan. 24-----	Flight day 3-----	TBD
Sunday, Jan. 25-----	Flight day 4-----	CLOSED
Mon.-Fri., Jan. 26-30--	Flight days 5-9 -----	8 a.m. - 4:30 p.m.
Saturday, Jan. 31-----	(Landing) Flight day 10----	11 a.m. - 2 a.m. (Sunday)

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-89 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

Monday, Jan. 19 -----	11 a.m. - 3:30 p.m.
Tuesday, Jan. 20 -----	8 a.m. - 4:30 p.m.
Wednesday, Jan. 21 -----	8 a.m. - 4:30 p.m.
Thursday, Jan. 22 -----	8 a.m. - 8:30 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the query counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 19, 1998

KSC Contact: Bruce Buckingham/Joel Wells

KSC Release No. 14-98



SHUTTLE MISSION STS-89 LAUNCH COUNTDOWN BEGINS TODAY

NASA will begin the countdown for launch of Space Shuttle Endeavour on mission STS-89 today at 7 p.m. EST at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 1 of the Launch Control Center.

The countdown includes 31 hours and 42 minutes of built-in hold time leading to an opening of the launch window at about 9:42 p.m. on Jan. 22. The launch window extends for 10 minutes though the preferred launch time is about 9:48 p.m.

STS-89 is the first Space Shuttle mission of 1998, the 12th flight of the orbiter Endeavour and the 89th flight overall in NASA's Space Shuttle program. STS-89 is scheduled to last 8 days, 19 hours, and 48 minutes with a planned KSC landing at 5:36 p.m. on Jan. 31.

Endeavour was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 1 on Dec. 12, 1997, and mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was transported to Pad 39A on Dec. 19.

Carrying a seven member crew, mission STS-89 is Endeavour's first flight to Russia's space station Mir. This will be NASA's 8th of nine missions to dock with Mir. All previous missions to dock with Mir were aboard the orbiter Atlantis.

This flight transports the final U.S. astronaut slated to stay aboard the space station for an extended period of time. Mission Specialist Andy Thomas will conclude Phase 1 of the International Space Station with a four-month stay on Mir. He will replace Dr. Dave Wolf who arrived there in September 1997. Wolf will return to Earth with the Endeavour crew and Thomas will remain at the space outpost through May.

During the five days Endeavour is docked with Mir, the crew will exchange several tons of scientific and logistical equipment and supplies, including water. They will also conduct several scientific experiments over the course of the mission.

The STS-89 crew consist of: Commander Terrence Wilcutt, Pilot Joe F. Edwards, Mission Specialists Andrew Thomas, Bonnie Dunbar, James Reilly, Michael Anderson, and Salizhan Sharipov.

The crew is scheduled to arrive at KSC at about 2:30 p.m. today. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES

*all times are Eastern

Launch - 3 Days (Monday, Jan. 19)

- Prepare for the start of the STS-89 launch countdown
- Perform the call-to-stations (6:30 p.m.)
- All members of the launch team report to their respective consoles in Firing Room 1 in the Launch Control Center for the start of the countdown
- Countdown begins at the T-43 hour mark (7 p.m.)
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Endeavour's general purpose computers
- Begin stowage of flight crew equipment

Launch - 2 Days (Tuesday, Jan. 20)

- Remove mid-deck and flight-deck platforms
- Activate and test navigational systems
- Complete preparations for loading of power reactant storage and distribution system
- Mid-deck and flight deck preliminary inspections complete

Enter first planned built-in hold at T-27 hours for duration of four hours (11 a. m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers

Resume countdown (3 p.m.)

- Begin operations to load cryogenic reactants into Endeavour's fuel cell storage tanks (3-11 p.m.)

Enter eight-hour built-in hold at T-19 hours (11 p.m.)

Launch - 1 Day (Wednesday, Jan. 21)

- After cryogenic loading operations, re-open the pad
- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs

Resume countdown (7 a.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Install mission specialists' seats in crew cabin
- Fill pad sound suppression system water tank
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 14 hours, 52 minutes (3 p.m.)

- Activate the orbiter's flight controls and navigation systems
- Begin startracker functional checks
- Activate orbiter's inertial measurement units
- Install film in numerous cameras on the launch pad
- Perform orbiter ascent switch list in crew cabin
- Activate the orbiter's communications systems
- Safety personnel conduct debris walk down
- Flight crew equipment late stow

Launch Day (Thursday, Jan. 22)

- Move Rotating Service Structure (RSS) to the park position (4 a.m.)
- Perform ascent switch list

Resume countdown (5:52 a.m.)

- Start fuel cell flow-through purge
- Activate the orbiter's fuel cells
- Clear the blast danger area of all non-essential personnel
- Configure communications at Mission Control, Houston, for launch
- Switch Endeavour's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned two-hour built-in hold at the T-6 hour mark (10:52 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel
- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 12:32 p.m.)

Resume countdown (12:52 p.m.)

- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 3:32 p.m.)

Enter planned two-hour built-in hold at T-3 hours (3:52 p.m.)

- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform open loop test with Eastern Range
- Conduct gimbal profile checks of orbital maneuvering system engines
- Close-out crew and Final Inspection Team proceed to Launch Pad 39A

Resume countdown at T-3 hours (5:52 p.m.)

- Crew departs Operations and Checkout Building for the pad (about 5:58 p.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 6:28 p.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Endeavour's crew hatch (about 7:43 p.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (8:32 p.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (8:42 p.m.)

- Transition the orbiter's onboard computers to launch configuration

- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 46-minute (estimated) hold at T-9 minutes (8:53 p.m.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (about 9:39 p.m.)

- Start automatic ground launch sequencer (T-9 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-6:15)
- Start Auxiliary Power Units (T-5)
- Arm SRB and ET range safety safe and arm devices (T-5)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1 minute)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

Go to the [KSC Press Releases Home Page](#)



JOHN F. KENNEDY SPACE CENTER

January 29, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 15-98



TWO KSC EMPLOYEES RECEIVE DISTINGUISHED PATENT AWARD

An innovative approach to combating the corrosive seaside environment at Kennedy Space Center has led to a prestigious award for two KSC employees. Karen Thompson and Coleman Bryan, both chemists for NASA at the space center, are members of a team recently honored with the 1997 Distinguished Patent Award by the Department of Energy's Los Alamos National Laboratory (LANL).

"It was very rewarding to have our patent chosen as the patent of the year from the many significant inventions that were brought to fruition at the LANL this year," observed Bryan after returning from an awards ceremony at Los Alamos.

U.S. Patent 5,658,649, entitled Corrosion Resistant Coating, was selected as the top patent from the 41 patents issued at LANL in 1997. The formula for the coating features polyaniline as its active ingredient. Polyaniline is a polymer made by connecting many hundreds of molecules of aniline end-to-end by means of a chemical reaction.

The environment at KSC is one of the most corrosive in the continental United States. The two Space Shuttle launch pads are less than a mile from the Atlantic Ocean and are exposed daily to salt spray and high humidity. Compounding the corrosive effect is hydrochloric acid and intense heat generated from a Space Shuttle launch, which attacks protective coatings on structures and machinery at the pads.

In 1986, KSC set out to formulate a conductive polymer coating that would be more protective than current materials. NASA KSC contracted with the Department of Energy's Los Alamos National Laboratory for assistance in the development work. The conductive polymer development effort has exceeded expectations and could revolutionize the coatings industry.

The idea of using conductive polymers to form corrosion-inhibiting coatings is very novel. Leaders in the field of electrically conductive polymers were initially skeptical about the concept of attempting to make coatings of such polymers, since their molecular structure makes it difficult to produce them in a form that can be sprayed or brushed onto a surface.

Also novel is the idea of using such materials to protect a substrate from corrosion. In fact, university experts specializing in the field of conductive polymers are working with NASA to better understand one test result, called "throwing power." Areas on metal samples coated with the new conductive polymer coating were scratched through to the bare metal and the samples immersed in aerated hydrochloric acid for 12 weeks.

Despite the rugged exposure, the bare metal showed very little corrosion. This throwing power of the new coating has been of great interest to industry and NASA KSC is working with an industry partner to further develop the new coating.

While the new conductive polymer coating was first developed for the space program, it may find applications around the world. The Navy is interested in the coating for submarine and aircraft carrier uses. The Admiral of the Pacific

Fleet in charge of maintenance received a briefing on the new technology from Thompson, and the Navy has joined the project team and is funding additional testing for Navy applications.

The new coating could also yield environmental and economic benefits for the United States. Most protective coatings manufactured today contain chromium and Europe currently commands the chromate coating market.

The U.S. Environmental Protection Agency and its European equivalents are expected to ban the use of all coatings containing chromium by the year 2000 because of environmental concerns. The work being conducted at KSC in developing conductive-polymer coatings work represents the forefront of chromium-free coating technology. If the resultant coatings are able to replace chromium-containing coatings, benefits to the U.S. economy could be substantial.

As current coatings are banned from use (as planned) or restricted, the new conductive polymer coating will provide corrosion protection while reducing pollution. The new conductive coating does not contain metals and doesn't pollute soils. In contrast, current repair procedures involving metal-containing coatings can result in pollution of soils due to sandblasting debris. Also, controlling sandblast debris is very costly when large structures are involved.

"We hope that coatings are developed which fulfill the needs identified by the Office of Space Flight (NASA's sponsor for the effort)-- as well as many additional needs throughout NASA. We also hope that the coatings developed will solve many needs identified throughout the country and the world. It has been rewarding to work with partners in two other government agencies, industry, and several universities in an effort where all team members have contributed in several areas of expertise to develop such a novel technology," Thompson said.

-- end --

(Editor's Note: Photo is available upon request by contacting the KSC News Center.)

Go to the [KSC Press Releases](#) Home Page



January 20, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 16-98



INFORMAL MEDIA OPPORTUNITY WITH JOHN GLENN SCHEDULED AT KSC

U.S. Senator John Glenn, who was recently announced as a payload specialist to fly on Space Shuttle mission STS-95 in October, will be touring KSC operational areas tomorrow afternoon, Jan. 21. There will be an informal opportunity for reporters to speak with Senator Glenn at the KSC Press Site at 5 p.m.

Mission STS-89 credentials will be honored for this opportunity. News media representatives needing credentials should call the KSC News Center at 407-867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-89 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island beginning at 8 a.m. Wednesday.

This informal press event is part of Glenn's itinerary which will include viewing the launch of Space Shuttle Endeavour Thursday night.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 30, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 27-98



ENDEAVOUR SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-89

The orbiter Endeavour is scheduled to land at Kennedy Space Center on Saturday, Jan. 31 at 5:35 p.m. EST completing its 9-day, 3.6 million mile, STS-89 mission which was launched from KSC on Jan. 22.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 139 at mission elapsed time 8 days, 19 hours, 47 minutes. Deorbit burn will occur at about 4:27 p.m. Saturday.

The two KSC landing opportunities on Saturday are: 5:35 p.m. and 7:11 p.m. EST. Managers have decided not to call up the back-up landing location at Edwards Air Force Base (EAFB), CA, for a landing attempt on Saturday.

If managers must keep Endeavour in orbit an additional day, two landing opportunities are available on Sunday at KSC and two at EAFB.

KSC Sunday landing times are: 6:07 p.m. and 7:44 p.m. EST.

EAFB Sunday landing times are: 9:14 p.m. and 10:50 p.m. EST.

This landing of Endeavour will mark the 42nd landing at KSC in the history of Space Shuttle flight. It will be the 13th consecutive landing at KSC and the 20th in the last 21 shuttle flights. Endeavour is currently on the 89th Space Shuttle mission in the history of the program.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Endeavour Jan. 22. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the

rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC Sunday afternoon.

If Endeavour lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 7 hours after Endeavour lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 1 for post-flight deservicing. Operations in OPF bay 1 will be made to prepare Endeavour for its next Space Shuttle mission, STS-88, currently scheduled for launch in July 1998.

-- end --

NOTICE TO EDITORS: The KSC press site will be open Saturday, Jan. 31, from 11 a.m. - about 12 midnight. Media wishing to view Endeavour's landing should be at the KSC press site between 2:30 - 4:30 p.m. Saturday, for transport to the Shuttle Landing Facility. Accreditation must be arranged in advance. Additional specific information regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours is available at the KSC News Center. Recorded status of KSC Space Shuttle launch and landing operations can be reached by calling 407-867-2525.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 30, 1998

KSC Contact: Joel Wells

KSC Release No. 28-98



FIRST SUPER LIGHTWEIGHT EXTERNAL TANK TO ARRIVE AT KSC FEB. 3

The Space Shuttle's first new, super lightweight external tank is scheduled to arrive at Kennedy Space Center on Feb. 3, weather permitting, to undergo processing for flight in May. Shipped by barge from NASA's Michoud Assembly Facility in New Orleans, LA, on Jan. 29, the improved tank is 7,500 pounds lighter than its predecessors and was developed to increase the Shuttle payload capacity on International Space Station assembly flights.

Standing 154 feet tall when mated to a Shuttle orbiter, the external tank holds a maximum of 143,351 gallons of liquid oxygen and 385,265 gallons of liquid hydrogen. These cryogenic propellants are used by the Shuttle's three main engines during liftoff and ascent. When the propellants are expended, the tank separates from the orbiter about nine minutes after liftoff and burns-up upon re-entry into the earth's atmosphere.

From the outside, the new orange colored tank appears identical to tanks currently used on Shuttle flights. Major changes, however, include the use of new materials and a revised internal design. The liquid oxygen and liquid hydrogen tanks are constructed of aluminum lithium - a lighter, stronger material than the metal alloy currently used. Also, the redesigned walls of the liquid hydrogen tank were machined to provide additional strength and stability.

Once on dock at KSC's turn basin, the tank will be transported across the street to the Vehicle Assembly Building where it will be mated in February to the twin solid rocket boosters. Space Shuttle Discovery is currently scheduled to be mated to the external tank in mid-April. Discovery and the new super lightweight tank are targeted for launch on mission STS-91 on May 28, 1998.

-- end --

NOTE TO EDITORS: A photo opportunity and informal question and answer session will be available to interested media on Feb. 3. Those planning to attend should call the KSC Press Site after 8 a.m., Feb. 3 to confirm the arrival of the external tank. Weather permitting, the photo opportunity will be at about 12:30 p.m. with the new external tank mounted on its transporter near the KSC Press Site parking lot. Once the ET has been delivered to the VAB transfer aisle, (at about 3 p.m.) media will be escorted from the Press Site to the VAB where managers will be available to answer questions. Scheduled to meet with the media are: NASA/KSC ET specialist, Jorge' Rivera; Lockheed Martin public affairs director, Marion LaNasa; and United Space Alliance ET/SRB integration manager, Gary Crawford.

Go to the [KSC Press Releases Home Page](#)



February 4, 1998

KSC Contact: Bruce Buckingham/George Diller

KSC Release No. 29-98



SNOE LAUNCH FROM VANDENBERG AFB, CA., POSTPONED 24-HOURS

Launch of the Student Nitric Oxide Explorer (SNOE) from Vandenberg Air Force Base (VAFB), CA, earlier set for late tonight, has been delayed at least 24-hours. Due to recent weather conditions in California, the required range support and personnel necessary to conduct a launch attempt from VAFB are not available tonight.

SNOE will be launched into orbit by a Pegasus XL rocket built by Orbital Sciences Corp., Dulles, VA. A Lockheed L-1011 aircraft will carry the Pegasus to an altitude of 39,000 feet over the Pacific Ocean prior to its release.

Payload test team managers earlier today reported that the Pegasus fairing, despite the severe weather, sustained no moisture intrusion and the SNOE payload was in good health.

On Thursday, Feb. 5, the aircraft is scheduled to depart from VAFB at about 10 p.m. PST, with the drop planned for about 11:04 p.m. PST.

Weather for tomorrow's launch attempt is not expected to be favorable, but should improve by Friday.

Go to the [KSC Press Releases Home Page](#)



February 5, 1998

KSC Contact: Bruce Buckingham/George H. Diller

KSC Release No. 30-98



PEGASUS/SNOE LAUNCH FROM VANDENBERG POSTPONED

Senior launch managers from NASA, Orbital Sciences Corporation and the U.S Air Force met today and decided to reschedule the launch of the Student Nitric Oxide Explorer (SNOE) spacecraft. Launch had been tentatively planned for the evening of Feb. 5 aboard a Pegasus rocket from Vandenberg Air Force Base, CA. Also aboard the Pegasus is the Batsat communications satellite for Orbital Sciences.

At this time, observed and forecast weather conditions make a launch attempt unlikely in the next few days. In reviewing the range launch schedule, managers determined that the next flight opportunity for this mission is anticipated to be during the week of Feb. 15. A more definite launch date will be determined as new schedules are developed and coordinated during the next week.

SNOE is an Earth-orbiting satellite designed and built by a team of University of Colorado at Boulder students, faculty and engineers who were selected to develop the mission by the Universities Space Research Association with funding from NASA. SNOE carries an ultraviolet spectrometer and two photometers to measure the effects of the sun's x-ray radiation and magnetic field on nitric oxide production. This is believed to effect the variability in the Earth's upper atmosphere.

Go to the [KSC Press Releases](#) Home Page



February 18, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 31-98



MONTGOMERY APPOINTED TO SENIOR EXECUTIVE SERVICE

Ann D. Montgomery, Deputy Director of Logistics Operations at NASA's Kennedy Space Center, has been appointed to the Senior Executive Service effective Feb. 15, 1998.

As Deputy Director of Logistics Operations, Montgomery is responsible for assisting in the technical management of the integrated logistics portions of the Space Flight Operations Contract, the Payload Ground Operations Contract, and the Base Operations Contract. She assists in planning for logistics support for the International Space Station and for future programs. Her other responsibilities include management of the various hands-on logistics functions, such as failure analysis, chemical and physical testing, propellants procurement, property management, and property disposal.

Montgomery graduated from the University of Florida with a Bachelor of Science in Mathematics and a Master of Science in Industrial Engineering. She joined NASA in 1968 as a Lead Crew systems engineer for the Apollo program. She assumed positions of increasing responsibility which included Site Manager of the Orbiter Processing Facility and flow director for the orbiter Columbia. Montgomery was the first woman assigned as a flow director at Kennedy Space Center. She has served as Deputy Director of Shuttle Logistics, Deputy Director of Logistics Operations, and Acting Director of Logistics Operations.

In 1991, Ms. Montgomery was awarded the NASA Exceptional Service Medal; in 1992 she was the recipient of the KSC Federal Woman of the Year Award; and in 1996 KSC honored Ms. Montgomery with the prestigious Center Director's award for her outstanding performance in the logistics directorate.

Ms. Montgomery and her husband, Brian, have two children - Keith and Sally. They live in Indian Harbour Beach.

Go to the [KSC Press Releases Home Page](#)



JOHN F. KENNEDY SPACE CENTER

February 24, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 32-98



NEW CHIEF COUNSEL NAMED AT KENNEDY SPACE CENTER

Bruce H. S. Anderson became the Chief Counsel of Kennedy Space Center, FL, effective Feb. 17, 1998.

"I'm pleased to have this important post filled by someone with such impressive credentials," said KSC Director Roy Bridges Jr. "Bruce's extensive experience as a lawyer, including several years as the Deputy Chief Counsel at Goddard, combined with his expertise in the field of civil engineering, make him the ideal candidate to serve as Chief Counsel of Kennedy Space Center."

Anderson most recently served as Chief Counsel for the U.S. Army Corps of Engineers TransAtlantic Programs Center in Winchester, VA, providing legal oversight and support for the Corps' construction and operations and maintenance projects in Europe, the former Soviet Union, the Middle East and Africa.

He has a bachelor of science degree in civil engineering from the University of Alabama. He earned his law degree from the same institution in 1975. Between engineering and law school, he was employed as a structural design engineer with Newport News Shipbuilding and Drydock Co., Newport News, VA.

Much of his professional legal career has involved the U.S. Army Corps of Engineers, beginning in June 1975 when he joined the Mobile District of the Corps in Alabama. Anderson went on to serve in a variety of additional posts with other Corps district and division offices in Tennessee, Nebraska and Virginia. He also spent about three years at NASA's Goddard Space Flight Center, Greenbelt, MD, where he was Deputy Chief Counsel.

Anderson also has been an instructor at the University of South Alabama, where he taught an undergraduate engineering course pertaining to legal matters of interest to practicing engineers. He is a member of several honorary and professional engineering and legal societies and has served as an arbitrator on the American Arbitration Association's Commercial Arbitration Panel. He is licensed to practice law in several states, various U.S. District Courts, various U.S. Circuit Courts of Appeals and the Claims Court.

Given a professional background that combines the fields of law and civil engineering, Anderson said he is thrilled to be the new Chief Counsel at a place like Kennedy Space Center. Many of the facilities on both KSC and Cape Canaveral Air Station were designed and built with the assistance of the Army Corps of Engineers, including the massive Vehicle Assembly Building.

"I'm honored to have the opportunity to practice law at a facility with a history so rich in engineering achievements," Anderson said. "I look forward to serving NASA, KSC and the space program."

Go to the [KSC Press Releases Home Page](#)



JOHN F. KENNEDY SPACE CENTER

February 20, 1998

KSC Contact: Bruce Buckingham/George Diller

KSC Release No. 33-98



NEW INTERNATIONAL SPACE STATION ELEMENTS ARRIVE AT KSC

Pressurized Mating Adapter-3 (PMA-3), the third PMA for the International Space Station (ISS), arrived at Kennedy Space Center today from the Boeing Company in Huntington Beach, CA. The Z1 Integrated Truss Segment, the initial framework component for the International Space Station, also began its processing at KSC in the Space Station Processing Facility this week.

PMA-3 and the Z1 truss are set to fly on Space Shuttle mission STS-92, the third ISS assembly flight. While in orbit, PMA-3 will be removed from the orbiter's payload bay by the astronauts using the remote manipulator arm and mated to Node 1, a connecting passageway to the living and working areas of the International Space Station. The primary purpose of PMA-3 is to serve as a Shuttle docking port through which crew members and equipment will transfer to ISS during later assembly missions.

The Z1 truss allows the temporary installation of the U.S. power module to Node 1. The truss will have attached to it control moment gyroscopes for attitude control and will also hold Ku-band and S-band telemetry equipment. In addition, it provides a mounting location for extra vehicular activity equipment.

Beginning this year with the launch of the first International Space Station element, more than 100 components will ultimately be assembled in low Earth orbit over the next five years using approximately 45 assembly flights. When complete, the station will provide access for researchers around the world to permanent, state-of-the-art laboratories in the weightless environment of space.

-- end --

Note to Editors: Still photographs and video of PMA-3 and the Z1 truss are available by calling the KSC Press Site at 407-867-2468. Also, on Monday, Feb. 23, the NASA TV video file will feature these elements as they begin their prelaunch processing at KSC.

Go to the [KSC Press Releases Home Page](#)



February 24, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 34-98



PEGASUS/SNOE LAUNCH FROM VANDENBERG RESCHEDULED

NASA managers, Orbital Sciences Corporation and U.S Air Force personnel have rescheduled the launch of the Student Nitric Oxide Explorer (SNOE) spacecraft for Wednesday, Feb. 25 at 11:04 p.m. PDT aboard a Pegasus rocket originating from Vandenberg Air Force Base, CA. Also aboard the Pegasus is the BATSAT communications satellite for Orbital Sciences.

Launch had been scheduled for Feb. 4 but was postponed do to complications resulting from inclement weather in California.

SNOE is an Earth-orbiting satellite designed and built by a team of University of Colorado at Boulder students, faculty and engineers who were selected to develop the mission by the Universities Space Research Association with funding from NASA. SNOE carries an ultraviolet spectrometer and two photometers to measure the effects of the sun's x-ray radiation and magnetic field on nitric oxide production. This is believed to effect the variability in the Earth's upper atmosphere.

At launch time, an L-1011 aircraft will carry the Pegasus XL rocket to an altitude of about 39,000 feet and release it over the Pacific Ocean. Pegasus will deliver SNOE to a planned circular orbit at an altitude of 580 kilometers and at an inclination of 97.75 degrees.

Go to the [KSC Press Releases Home Page](#)



February 26, 1998

KSC Contact: Bruce Buckingham/George H. Diller

KSC Release No. 35-98



PEGASUS/SNOE SUCCESSFULLY LAUNCHED

The launch of the Student Nitric Oxide Explorer (SNOE) spacecraft aboard an Orbital Sciences Pegasus rocket occurred as planned on Feb. 25 at 11:05 p.m. PST. The Pegasus was dropped from an L-1011 aircraft 100 miles west of Monterey, CA, over the Pacific Ocean.

"It was a quiet and uneventful countdown," said NASA Launch Manager Ray Lugo. "The launch was perfect."

The first data from the spacecraft was received at 12:30 a.m. PST by the Poker Flats, AK, tracking station and relayed to the NASA telemetry facility at Vandenberg Air Force Base, CA.

"After the first orbit, the data from the spacecraft was exactly what we were hoping to see," said Dr. Charles Barth, SNOE Principal Investigator from the University of Colorado at Boulder.

SNOE is an Earth-orbiting satellite designed and built by a team of Boulder students, faculty and engineers who were selected to develop the mission by the Universities Space Research Association with funding from NASA. SNOE carries an ultraviolet spectrometer and two photometers to measure the effects of the sun's x-ray radiation and magnetic field on nitric oxide production. This is believed to affect the variability in the Earth's upper atmosphere.

Go to the [KSC Press Releases Home Page](#)



March 10, 1998

KSC Contact: George H. Diller

KSC Release No. 36-98



INTERNATIONAL SPACE STATION NODE 1 READY FOR LEAK TEST

Node 1, the first International Space Station element, continues with planned prelaunch preparation activities at the KSC Space Station Processing Facility (SSPF). Node 1 is a connecting passageway to the living and working areas of the space station. The midpoint has now been reached in the Cargo Element Integrated Test which will ultimately verify the node's functional readiness for launch.

Today in the SSPF, the node is being removed from the element rotation stand, or test stand, for an interim weight and center of gravity determination. The final determination is planned to be performed prior to transporting Node 1 to the launch pad. Upon completing this activity today, the node will be hoisted into the Shuttle payload transportation canister and the doors will be closed. There the node will remain for a two-week leak check. The node will be pressurized with a combination of helium and air. Then, the interior of the canister will be monitored for any evidence of helium leakage from the node. At the conclusion of the test, the node will be removed from the payload canister and returned to the element rotation stand in the SSPF for completion of the Cargo Element Integrated Test.

Later, in the Operations and Checkout Building, other elements of the International Space Station will be leak checked in an altitude chamber built originally by NASA for the Apollo program. Modifications to the chamber are now being made to accommodate these components.

NOTE TO EDITORS: Video and still photographs of today's Node 1 activity are available by contacting the KSC News Center at 407/867-2468.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

March 23, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 38-98



KSC'S NATURAL GAS-FUELED VEHICLES CONTINUE TO ADVANCE CLEAN AIR OBJECTIVES

KSC's continued use of compressed natural gas (CNG)-fueled vehicles has kindled the interest of the Space Coast Clean Cities Coalition. As a result, on March 25, the coalition (a group sponsored by the U.S. Department of Energy and facilitated by the Florida Solar Energy Center in Cocoa) will tour the space center's CNG Refueling Station to learn more about KSC's fleet of natural gas-fueled vehicles and a program to develop a hydrogen/CNG mix vehicle.

The refueling station opened at KSC in May 1996 and currently services more than 150 CNG-fueled vehicles on center. KSC's use of these vehicles helps protect the environment and demonstrates the operational benefits of alternative fuels.

The coalition will arrive at KSC via an alternative fueled-bus, courtesy of KSC. At the space center, the group will view a display of GSA-provided vehicles and attend a demonstration of refueling capabilities. The coalition's interest is sparked by the group's initiative to promote the use of alternative fuels, particularly in government and industry fleets.

"Operating compressed natural gas-fueled vehicles supports KSC's environmental initiatives and provides technology transfer to the surrounding community," said H.T. Everett, KSC chief of the Support Operations Branch. "CNG vehicles burning this fuel have less engine wear resulting in reduced maintenance costs." Alternative fueled-vehicles produce up to 65 percent less carbon monoxide, up to 93 percent fewer reactive hydrocarbons, and up to 87 percent fewer nitrogen oxides than traditional gasoline-fueled motor vehicles.

Also, compressed natural gas can increase engine life by as much as 75 percent, triple exhaust system life, and double the interval between oil changes. Even then, the used oil comes out looking as clean as the day it went in. What's more, in gasoline engines, some of the fuel seeps past the piston rings and mixes with the engine oil. Because gasoline acts like a solvent, this mixing of engine oil with gasoline breaks down the oil's viscosity, or ability to lubricate. The result is increased engine wear and tear. Because CNG burns so cleanly, spark plugs and lubricants require fewer changes, and tune-ups aren't needed as often.

Compressed natural gas fuels are safer and cheaper than gasoline as well. Because CNG is lighter than air, it dissipates quickly into the atmosphere. Also, CNG ignites at a much higher temperature than gasoline, making inadvertent ignition less likely. CNG fuel can cost one-third less than gasoline, and, unlike gasoline, CNG fuel cannot be siphoned, which makes refueling stations more secure.

Increased use of these fuels advances clean air objectives, reduces dependence on foreign oil, and creates employment opportunities.

The Space Coast Clean Cities Coalition is facilitated by the Florida Solar Energy Center with assistance from the Florida Energy Office. The coalition encompasses stakeholders from Brevard, Indian River, Orange, Osceola, Seminole, St. Lucie, and Volusia counties. Among the coalition's members are fleet owners and managers from local governments, federal agencies, and private industry.

Go to the [*KSC Press Releases*](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

March 23, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 39-98



Note to Editors:

HOME BOX OFFICE TO HOST PREMIERE AT KSC

Home Box Office and Imagine Entertainment will host a premiere of the 12-part miniseries called "From Earth to the Moon" at Kennedy Space Center, Wednesday, March 25.

The series was filmed in part on location at KSC and dramatizes the human aspects of NASA's efforts to launch Americans to the Moon. The miniseries highlights NASA's Apollo program and the events leading up to and including the six successful missions to the Moon.

A special 500-seat theater has been constructed next to the Apollo/Saturn V Center and attendees will have a chance to see the historic hardware following the premiere showing. Scheduled speakers at the event include KSC Director Roy Bridges; Jeff Bewkes, chairman and CEO for HBO; and John F. Kennedy, Jr., editor-in-chief, George Magazine. In addition, Buzz Aldrin, Apollo 11 astronaut, and Al Worden, Apollo 15 astronaut, are scheduled to attend.

The sneak preview featuring the episode entitled "1968" will be shown to invited guests which will include many of the people who worked at KSC on the Apollo program and those involved in the filming and distribution. The original miniseries event, created for HBO by actor Tom Hanks and Imagine Entertainment, will premiere on HBO beginning April 5, 1998.

Media interested in covering the event are requested to contact the KSC Press Site by close of business Wednesday, March 25, to insure proper accreditation. Media planning to attend the premiere showing must be at the KSC Press Site between 6 - 6:30 p.m. Wednesday for transport to the Apollo/Saturn V Center.

Go to the [KSC Press Releases Home Page](#)



JOHN F. KENNEDY SPACE CENTER

March 23, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 40-98



KSC PROVIDED \$1.038 BILLION BOOST TO FLORIDA'S ECONOMY IN FY '97

Space-related employment and contracts at NASA Kennedy Space Center yielded a \$1.038 billion boost to Florida's economy during the 1997 fiscal year which ended Sept. 30. This figure represents \$915 million in contract dollars and purchases along with \$122.6 million in civil service personnel compensations.

About 92 percent of the Florida impact dollars, about \$781.5 million, was expended within Brevard County. Of the total expenditures, \$719.2 million went to contractors operating on-site at the space center.

An additional \$62.3 million went to off-site businesses in Brevard County, while \$40.6 million was awarded to Florida businesses outside the county. Out-of-state purchases totaled about \$166.8 million.

KSC surpassed its small business contract goal of \$50 million by awarding over \$72 million in contracts to small, disadvantaged and woman-owned businesses.

Permanent federal employees at KSC totaled 1,940 on Dec. 31, 1997. While about 2,948 people were employed through construction and tenant jobs at KSC, the majority of the workers were employed by the on-site contractors and numbered about 9,798. Approximately 14,686 workers were employed at KSC through the close of the year. These numbers do not take into account the 1998 Civil Service buyouts or the reorganization of the prime Shuttle contractor, United Space Alliance.

Jan. 31 was the last day NASA employees could take advantage of the agency's fourth buyout offer. The downsizing resulted in the voluntary departure of 75 federal employees, leaving KSC with a current civil service work force of about 1,925. A second buyout of 1998, the fifth since 1994, is scheduled to be completed on April 3.

During fiscal year '97, major contractors at KSC included United Space Alliance, the Space Flight Operations Contractor (under contract with Johnson Space Center, Houston, TX); EG&G Florida Inc., the Base Operations Contractor; The Boeing Company, the Payload Ground Operations Contractor; and Dynacs Engineering Company, Inc., providing engineering services.

Go to the [KSC Press Releases Home Page](#)



JOHN F. KENNEDY SPACE CENTER

April 10, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 41-98



KSC TESTS NEW GROUNDWATER CLEANUP TECHNIQUE

Kennedy Space Center's Environmental Program Office is working with the University of Central Florida's colleges of engineering and chemistry to test a new technique for the cleanup of groundwater contaminated with trichloroethylene (TCE). Two U.S. patents are pending on processes involved with the new cleanup technique.

The demonstration project run by the university and the space center is being conducted near Cape Canaveral Air Station's Launch Complex 34, formerly used for Saturn 1B missions in the 1960s. During this time, material washing and engine flushing resulted in the release of TCE into the ground at Complex 34.

Trichloroethylene, a toxic solvent and the most common chlorinated contaminant, has been found at hundreds of sites around the country.

The University of Central Florida submitted a proposal to KSC's Biomedical Office to try a new technique which introduces iron shavings into the ground to render the trichloroethylene non-toxic. Ultrasound is used below the ground's surface to cleanse the iron shavings which corrode naturally and lose their effectiveness. This technique is called "sonication." Last year, the space center joined with the university to test these underground "iron walls" at Complex 34. Both organizations submitted the "sonication" technique along with the entire construction process for U.S. patent approval last year.

According to Jackie Quinn, NASA's environmental engineer on the project, "using ultrasound underground within a permeable treatment wall of iron has never been done before and has far-reaching applications to other decontamination projects using such walls in the United States."

The process includes building a permeable wall of iron shavings beneath the ground's surface to interact with the contaminated water. The iron is inserted into the ground by drilling casings down to the 40-foot clay level. Because TCE has a density greater than water, TCE will sink into the ground until it reaches a layer through which it cannot pass, in this case, clay. Residual TCE is also found throughout the soil above the 40-foot level. Therefore, the iron is inserted down to the clay layer because TCE will sink no further. The casings are removed and the iron is mixed deep within the soil by an auger. Through an exchange of electrons, the iron cleanses the TCE from the groundwater.

Through the course of time, corrosion forms on the iron shavings rendering them ineffective. Using ultrasound underground, the corrosive buildups are knocked off the iron so it can continue in the decontamination process. The ultrasound is introduced below the

ground's surface by a submersible transducer lowered on a cable through a well to the clay level.

"This sonication technique is new and has not yet been explored in other groundwater cleanup processes for TCE," says Quinn. "In addition to sonication, an acid bath is used to clean the iron. This is a new process that we expect will yield improved results for the decontamination process. The success of this project could have widespread implications for many organizations across the world dealing with groundwater cleanup of TCE."

The process being tested at Complex 34 is advantageous over other cleanup techniques since it does not create worker exposure to hazardous waste, there is no need for disposal of hazardous waste to other land fill areas, and it keeps costs down since the treatment wall uses natural groundwater flow to "push" the contaminated water through the treatment wall. Since the lay of the land is so flat, the water moves extremely slow, and the greatest area of TCE concentration is closest to the source of contamination.

"We wholeheartedly support the research project in an effort to improve the environment at KSC," says Irene Long, M.D., director of KSC's Biomedical Office, "and we encourage partnerships with the academic community to achieve mutual agency and community-related goals."

Drilling commenced in late February and testing for results of the process has continued following initial placement of the iron.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

March 24, 1998

KSC Contact: George Diller/Bruce Buckingham

KSC Release No. 42-98



Note to Editors/News Directors:

TRACE SPACECRAFT TO BE LAUNCHED ABOARD PEGASUS XL APRIL 1

The launch of NASA's Transition Region and Coronal Explorer (TRACE) spacecraft aboard an Orbital Sciences Pegasus XL vehicle is scheduled for Wednesday, April 1, during a window which extends from 6:38:32 - 6:45:40 p.m. PST. The drop of the Pegasus from the L-1011 aircraft is targeted to occur inside of the launch window at 6:40 p.m. PST at a location over the Pacific Ocean approximately 100 miles offshore from Vandenberg Air Force Base, CA.

The 465-pound TRACE spacecraft will study the evolution of events in the Sun's atmosphere that originate at the solar surface and travel through the four regions of the Sun on their way towards Earth. The coming months in the Sun's cycle will provide solar scientists with periods of intense solar activity - massive flarings and huge eruptions - interspersed with periods when the Sun is relatively passive and quiet. Thus, TRACE will be able to study the full range of solar conditions, even in its relatively short one-year life.

The prelaunch news conference, to be carried live on NASA Television, is scheduled to occur on launch day, Wednesday, April 1, at 11 a.m. PST in the conference room of the NASA-KSC Resident Office at Vandenberg Air Force Base. Two-way question and answer capability will be available from NASA Headquarters, Kennedy Space Center and Goddard Space Flight Center.

Participating in the prelaunch news conference will be:

- Ray Lugo, NASA Launch Manager, Kennedy Space Center
- Bruce Clark, Pegasus Launch Vehicle Manager, Goddard Space Flight Center
- J.R. Thompson, Manager, Orbital Launch Services
Orbital Sciences Corporation
- Jim Watzin, TRACE Mission Director/Manager, Small Explorer Project
Goddard Space Flight Center
- Dr. Alan Title, TRACE Principle Investigator
Stanford-Lockheed Institute for Scientific Research
- Captain Tamara Parsons, Launch Weather Officer
USAF 30th Weather Squadron, Vandenberg Air Force Base

Media desiring to cover the prelaunch news conference and mission science briefing should meet at the south gate of Vandenberg Air Force Base on California State Road 246 at 10:45 a.m. on Wednesday, April 1, for escort to the

NASA-KSC Vandenberg Resident Office.

ACCREDITATION

Media desiring accreditation information should contact the Air Force at:

Public Affairs Office
Vandenberg Air Force Base
Telephone: 805/734-8232, Ext. 6-3595
FAX: 805/734-8232, Ext. 6-8303
E-mail: pubaffairs@plans.vafb.af.mil

NASA Pegasus/TRACE access badges will be issued on April 1 for entry to NASA facilities on Vandenberg Air Force Base. They will be valid for the prelaunch news conference and to cover launch.

LAUNCH DAY PRESS COVERAGE

On launch day, media representatives should meet at the Vandenberg main gate at 5:15 p.m. to be escorted to the runway for the take-off of the L-1011. After departure, media will be taken to the viewing room of the NASA Mission Director's Center located at Building 840 on South Vandenberg Air Force Base. From there, media may follow the release and launch of Pegasus/TRACE.

Assuming a nominal flight of the Pegasus launch vehicle, a post-launch news conference will not be held. However, launch vehicle and spacecraft representatives will be available afterward to informally answer questions from the media.

NASA TELEVISION COVERAGE OF PEGASUS/TRACE

Launch coverage on NASA Television will begin at 5:30 p.m. PST and continue through spacecraft separation from the Pegasus vehicle. Live launch commentary and audio of all Pegasus/TRACE briefings will be available on the "V" audio circuits which may be dialed at 407/867-1220, 1240 or 1260.

NASA Television is on GE-2, Transponder 9C located at 85 degrees West longitude.

PEGASUS/TRACE NEWS CENTER

The Pegasus/TRACE News Center at the NASA-KSC Vandenberg Resident Office will be staffed starting Monday, March 30 and may be reached between 8 a.m. and 4:30 p.m. PST at 805/734-8232, Ext. 5-3051 or Ext. 5-3001. A recorded status report will also be available starting at that time and may be reached by dialing 805/734-8232, Ext. 5-3456.

Go to the [KSC Press Releases Home Page](#)



JOHN F. KENNEDY SPACE CENTER

March 26, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 43-98



Note to Editors:

MEDIA OPPORTUNITY WITH STS-90 CREW SET FOR NEXT WEEK'S TCDT

The crew of Space Shuttle mission STS-90 will be at Kennedy Space Center early next week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held at KSC prior to each Space Shuttle flight, providing the crew of each mission an opportunity to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cut-off. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The seven-member crew of mission STS-90 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 9:30 a.m. Sunday, March 29. No photo opportunity is scheduled for this event.

On Monday, March 30, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39B. Media interested in participating in this question and answer session should be at the KSC Press Site by 7:30 a.m. Monday for transport to the pad. This question and answer session will be a local media event only.

At 10:15 a.m. Monday, STS-90 Mission Specialist Kay Hire, KSC's first "homegrown" astronaut, will make a special solo appearance at the KSC Press Site to answer additional media questions about her personal career and preparations for her first Space Shuttle flight.

On Tuesday, the entire crew will take part in simulated launch day events. At the pad, the crew will enter the orbiter Columbia fully suited for the simulated Shuttle main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Columbia is targeted for launch on April 16 at 2:19 p.m. EDT. STS-90 is scheduled to last about 17 days and will feature the Neurolab, a spacelab mission dedicated to research on the nervous system and behavioral changes in space.

Crew members for mission STS-90 are: Commander Richard Searfoss; Pilot Scott Altman; Mission Specialists Richard Linnehan, Dave Williams and Kay Hire; and Payload Specialists Jay Buckey and James Pawelczyk.

Go to the [KSC Press Releases Home Page](#)



STS-90 Columbia Neurolab

**KSC Release No. 44-98
April 1998**

[STS-90 images](#)

The Neurolab life sciences mission aboard the Space Shuttle Columbia will focus on one of the most complex and least understood parts of the human body – the nervous system.

The goals of Neurolab on Mission STS-90 will be to conduct basic research in the neurosciences and to expand understanding of how the nervous system develops and functions in space. The scheduled 16-day mission is expected to provide useful information for overcoming some of the physiological challenges of long-duration stay aboard the International Space Station, as well as in the treatment of diseases and improvement of life back on Earth.

The neurological system includes the brain, spinal cord, peripheral nerves and sensory organs. It controls blood pressure, maintains balance, coordinates movements and regulates sleep – all areas that are particularly affected by space flight.

Crew members will serve as operators and subjects of the 26 life sciences experiments. Other test subjects include rats, mice, crickets, fish and snails.

Most of the experiments will be conducted inside the Spacelab long module, a pressurized laboratory carried in Columbia's payload bay.

Neurolab is a cooperative effort of the National Aeronautics and Space Administration (NASA) and five other space agencies as well as a number of domestic partners. The international partners include the space agencies of Canada (CSA), France (CNES) and Germany (DARA), as well as the European Space Agency (ESA) and the National Space Development Agency of Japan (NASDA). Domestic partners include several institutes of the National Institutes of Health, the National Science Foundation and the Office of Naval Research.

The Neurolab mission will serve as a model of the international partnership in life sciences research aboard the International Space Station.

The 90th Space Shuttle launch and 25th flight of Columbia (OV-102) will begin with liftoff from Launch Pad 39B. Columbia will ascend at a 39-degree inclination to the equator for direct insertion to a 173-statute-mile (150-nautical-mile/278-kilometer) orbit.

Landing is planned at Kennedy Space Center's Shuttle Landing Facility.



The Crew

Leading the seven-member flight crew as mission commander will be two-time Shuttle flier Richard A. "Rick" Searfoss, an Air Force lieutenant colonel. He was selected as an astronaut candidate in 1990 while serving as a flight instructor at the U.S. Air Force Test Pilot School at Edwards Air Force Base, CA. This will be his first Shuttle flight as mission commander. He was the pilot on STS-58 in 1993 and STS-76 in 1996.

Scott D. Altman, a commander in the Navy, will make his first space flight. A Naval officer since 1981, he held a variety of positions, including test pilot, fighter pilot and strike leader flying over southern Iraq. He was selected for the astronaut program in 1994.

Mission Specialist Richard M. "Rick" Linnehan, a veterinarian, will serve as payload commander. He flew once before, as a mission specialist on STS-78 in 1996. He was the chief clinical veterinarian for the U.S. Navy Marine Mammal Project in California before being chosen by NASA in 1992.

Mission Specialist Kathryn "Kay" P. Hire, a commander in the U.S. Naval Reserve, also will be the flight engineer on her first space flight. In 1993, she became the first female in America assigned to a combat air crew. She was an engineer and supervisor with Lockheed Space Operations Co. at Kennedy Space Center (KSC) in 1995 when she became KSC's first employee to be chosen as an astronaut candidate.

Mission Specialist Dafydd "Dave" Rhys Williams, a medical doctor and Canadian Space Agency (CSA) astronaut, also will fly for the first time. He was selected as an astronaut by the CSA in 1992 and later joined the 1995 NASA astronaut class. The experienced neuroscientist and physician is assistant professor of surgery at McGill University.

Serving as payload specialists will be rookie space fliers Jay Clark Buckey Jr., a medical doctor; and James A. "Jim" Pawelczyk, who has a doctor of philosophy degree in biology (physiology) and completed a post-doctoral fellowship in cardiovascular neurophysiology. They were chosen for their expertise in the Neurolab experiments. Buckey was co-investigator and project manager for an investigation which flew on the Spacelab Life Sciences-1 (SLS-1) and SLS-2 missions. He also served as an alternate payload specialist on SLS-2. He is an associate professor of medicine at Dartmouth-Hitchcock Medical School. Pawelczyk is a co-investigator for experiments on Neurolab and two Shuttle-Mir flights. He is an assistant professor of physiology and kinesiology at Pennsylvania State University.

Also training for STS-90 as alternate payload specialists are Alexander William Dunlap, a medical doctor and a

veterinarian; and Chiaki Mukai, a medical doctor who also has a doctorate in physiology. Dunlap is on leave from his residency at the University of Tennessee Department of Family Medicine. Mukai, a NASDA astronaut, was an alternate payload specialist on STS-47 in 1992, and flew on STS-65 in 1994. During the mission, the alternates will work with the payload flight crew members.



Neurolab experiments

Neurolab is NASA's contribution to a national research effort in the 1990s, which was designated by President George Bush as the "Decade of the Brain."

Eight scientific teams are responsible for the 26 experiments on Neurolab. Four of the teams will oversee a combined total of 11 experiments with the crew as human subjects. The other four teams will conduct 15 investigations using mice, rats, crickets, snails and fish.

The four teams using human test subjects are:

- The Autonomic (Involuntary) Nervous System Team will examine the effects of microgravity on the regulatory systems in humans, as well as the problems of autonomic system adaptation following space flight. The control of blood pressure is the major focus of these experiments.
- The Sensory Motor and Performance Team will investigate the effects of adaptation to microgravity on human perception and motor functions. Using virtual reality headgear for the first time in space, the team will study how astronauts use vision, the vestibular organs of the inner ear, and pressure cues to perceive their own orientation and the identity of objects around them. Other experiments will test eye-hand coordination, and the ability of the human central nervous system to accept and interpret new stimuli in space.
- The Sleep Team will evaluate the sleep patterns of crew members before, during and after the mission to identify the factors in sleep disturbances which may be associated with space flight. One study will focus on the hormone melatonin to determine its value as a sleep aid and its effects on daytime performance. Another experiment will examine how changes in respiration alter sleep and how sleep disturbances alter breathing.
- The Vestibular Team will study the balance organs in the inner ear and all the connections they make to the eyes, brain and muscles. Using the techniques of centrifugation and eye movement measurement, the team will examine the human vestibular system.

The four teams with non-human subjects are:

- The Neurobiology Team will investigate the effects of microgravity on development of gravity receptors in the domestic cricket. The experiment will attempt to answer the question of how much of normal development is preprogrammed genetically and how much can be modified by environment and experiences.
- The Aquatic Team will examine the effects of microgravity on the development and activation of vestibular gravity-sensing organs in fish and snails. Vestibular nerve impulse data will be collected and measured for the first time using a new wireless telemetry system devised by NASDA. Data from the aquatic experiments may

help to pinpoint the mechanisms at work in various forms of motion sickness.

- The Mammalian Development Team will study the effects of space flight on normal development of the nervous system in rats and mice. In one investigation, young rats will take their first steps in space, helping scientists to determine whether "walking" develops the same way in space as on Earth.
- The Adult Neuronal Plasticity Team will investigate the neural and physiological changes in rats during space flight. For example, scientists will look for changes in the rodents' circadian rhythms of body temperature, heart rate, and activity when exposed to different light cycles.

Spacelab

STS-90 will be the 16th and last planned flight of the ESA-developed Spacelab pressurized module which first flew on the Space Shuttle in 1983.

The Spacelab modules are being phased out because future microgravity research will be conducted in space station laboratories. Spacelab pallets will continue to be used on the International Space Station.

Other Experiments

Additional payloads include the Shuttle Vibration Forces experiment to provide flight measurements of the vibratory forces between an aerospace payload and its mounting structure; the Bioreactor Demonstration System-04, a tissue culture apparatus; and three Get-Away Special (GAS) canister investigations. The GAS can experiments include a prototype instrument cooler for planetary missions, a test of the collision of dust particles in space, and ultraviolet measurements of the Earth's upper atmosphere.

GO TO THE [KSC FACT SHEETS](#) HOME PAGE

GO TO THE [KSC PRESS RELEASES](#) HOME PAGE



April 2, 1998

KSC Contact: George Diller

KSC Release No. 45-98



NEUROLAB SHUTTLE MISSION TO LAUNCH APRIL 16

Space Shuttle Program managers today affirmed April 16 as the launch date for NASA's second Shuttle mission of 1998 - a two week plus life sciences research flight that will focus on the most complex and least understood part of the human body, the nervous system.

The Flight Readiness Review held at the Kennedy Space Center, Fla. earlier today is the final major review by all of the Shuttle project offices to evaluate the readiness of the flight crew, vehicle, along with launch and mission control flight teams to support the launch of Space Shuttle Columbia on the STS-90 Neurolab mission.

Columbia is scheduled for launch on April 16, 1998 from NASA's Kennedy Space Center Launch Complex 39-B. The 2 1/2 hour available launch window opens at 2:19 p.m. Eastern. The STS-90 mission is scheduled to last 15 days, 21 hours, 50 minutes. However, mission managers are reserving an option of extending the flight one additional day for science operations if Shuttle electrical power margins permit. A launch on April 16 and a 16 or 17 day nominal mission being flown would have Columbia landing back at Kennedy Space Center on May 2 or May 3.

The STS-90 Mission Commander is Richard A. Searfoss. Pilot for the flight is Scott D. Altman. There are three mission specialists assigned to this mission -- Richard M. Linnehan, who is also serving as the the Payload Commander, Kathryn P. (Kay) Hire and Dafydd (Dave) Rhys Williams from the Canadian Space Agency. Two payload specialists -- Jay Clark Buckey, Jr. and James A. (Jim) Pawelczyk -- round out the seven member STS-90 crew.

STS-90 will be the 25th flight of Columbia and the 90th mission flown since the start of the Space Shuttle program in April 1981.

Go to the [KSC Press Releases Home Page](#)



JOHN F. KENNEDY SPACE CENTER

April 6, 1998

KSC Contact: George H. Diller

KSC Release No. 46-98



SPACE STATION LONG SPACER ELEMENT BEGINS PROCESSING AT KSC

The Long Spacer, a component of the International Space Station, has arrived at the KSC Space Station Processing Facility. It begins its processing today with removal from the shipping container and installation into a test stand located in the northeast corner of the high bay.

The Long Spacer provides structural support for the outboard Photovoltaic Modules that supply power to the station. Now just a structure, the Long Spacer will have attached to it as part of processing a heat dissipation radiator and two Pump and Flow Control subassemblies which circulate ammonia to cool the solar array electronics. Also to be mounted are ammonia fluid lines as part of the cooling system, and the cabling necessary for power and control of the station. The Long Spacer becomes an integral part of a station truss segment when it is mated to the Integrated Equipment Assembly (IEA). The IEA stores the electrical power generated by the solar arrays for use by the station modules.

The Long Spacer is being processed in preparation for STS-97, currently planned for launch aboard Discovery in April, 1999.

Meanwhile, work is progressing on Node 1 which continues to be processed with July as the launch time frame. A four-day leak-check test of the node concluded with the flight hardware displaying virtually no signs of leakage.

For the test, Node 1 and the attached Pressurized Mating Adapter-1 were installed in the payload canister which was pressurized with a partial mixture of helium and air. Helium sensors installed in the canister monitored the hardware for signs of helium leakage.

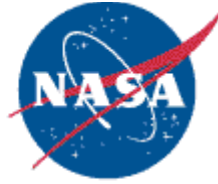
Ensuring that the hardware is sealed against exposure to the vacuum of space is a key aspect of preparing the International Space Station hardware for flight. Payload engineers were delighted with the results, which confirmed the integrity of the U.S.-built hardware.

"The leak test was very successful," said STS-88 NASA Payload Manager Steve Ernest, adding that one more pressurization test will be conducted following final Node 1 closeouts and prior to being transported to the launch pad.

NOTE TO EDITORS: Video of the Long Spacer processing activities which began today in the SSPF are available at the NASA-KSC News Center or by faxing a request of 407/867-2692.

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

April 9, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 47-98



Notice to Editors/News Directors:

MISSION STS-90 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the April 16 launch of the Space Shuttle Columbia on Mission STS-90, the 90th launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted.

The seven STS-90 crew members are scheduled to arrive at KSC on Monday, April 13, at about 3:30 p.m. EDT. News media representatives planning to cover the event must be at the News Center by 2:30 p.m. Monday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the KSC News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-90 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times.

-- end of general release --

Information about the countdown and mission can be accessed electronically via the Internet at:
<http://www.ksc.nasa.gov/shuttle/countdown/> and at <http://shuttle.nasa.gov/>

KSC press releases and other information are available on the KSC PAO Home Page at: <http://www-pao.ksc.nasa.gov/kscpao/kscpao.htm>

STS-90 BRIEFING & EVENTS SCHEDULE (all times are EDT)

(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Monday, April 13
(Launch countdown begins at 2 a.m.)

Countdown Status Briefing ----- 9 a.m.

- Doug Lyons, NASA Test Director
- Scott Higginbotham, STS-90 Payload Manager
- Ed Priselac, Shuttle Weather Officer

STS-90 Flight Crew Arrival (Live on NASA TV) ----- 3:30 p.m.

L-2 Days - Tuesday, April 14

Countdown Status Briefing ----- 9 a.m.

- Debra Frostrom, NASA Test Director
- Scott Higginbotham, STS-90 Payload Manager
- Ed Priselac, Shuttle Weather Officer

L-1 Day - Wednesday, April 15

Countdown Status Briefing ----- 9 a.m.

- Debra Frostrom, NASA Test Director
- Scott Higginbotham, STS-90 Payload Manager
- Ed Priselac, Shuttle Weather Officer

Pre-launch News Conference ----- 1 p.m.

- Tommy Holloway, Shuttle Program Manager, NASA, Johnson Space Center
- Dr. Arnauld Nicogossian, Associate Admin., Office of Life & Microgravity Sciences
- Dr. Andrew Monjan, Chief, Neurobiology of Aging Branch, National Institute on Aging
- Barry Wetter, Dir. General Space Science Program, Canadian Space Agency
- Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
- Captain Clif Stargardt, Staff Meteorologist, 45th Weather Squadron

Launch Day - Thursday, April 16

(Tanking begins at about 5:30 a.m.)

NASA Television live launch programming begins ----- 8 a.m.

Launch of Columbia ----- 2:19 p.m.

Post-launch Press Conference ----- Launch + 1 hour

- Donald R. McMonagle, Manager, Launch Integration for the Space Shuttle Program
- Dave King, KSC Launch Director

KSC News Center office hours for STS-90

(hours may be adjusted for in-flight events)

Monday, April 13-----	(Launch minus 3 days)-----	8 a.m. - 7 p.m.
Tuesday, April 14-----	(Launch minus 2 days)-----	8 a.m. - 4:30 p.m.
Wednesday, April 15-----	(Launch minus 1 day)-----	8 a.m. - 7 p.m.
Thursday, April 16-----	(Launch) Flight day 1-----	4 a.m. - 12 midnight
Friday, April 17-----	Flight day 2-----	8 a.m. - 4:30 p.m.
Sat/Sun, April 18-19-----	Flight days 3-4-----	CLOSED
Monday, April 20-----	Flight day 5-----	8 a - 6:30 p.m.
Tues.-Fri., April 21-24---	Flight days 6-9-----	8 a.m. - 4:30 p.m.
Sat/Sun, April 25-26-----	Flight days 10-11-----	CLOSED
Mon.-Fri, April 27-May 1--	Flight days 12-16-----	8 a.m. - 4:30 p.m.
Saturday, May 2-----	Flight day 17-----	TBD
Sunday, May 3-----	(Landing) Flight day 18-----	TBD

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-90 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt

Island, during the following times:

Pass and Identification Hours

Monday, April 13 ----- 8 - 9 a.m. and 12 - 2:30 p.m.

Tuesday, April 14 ----- 8 a.m. - 4:30 p.m.

Wednesday, April 15 ----- 8 a.m. - 4:30 p.m.

Thursday, April 16 ----- 8 a.m. - 1 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the query counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

April 10, 1998

KSC Contact: Joel Wells

KSC Release No. 48-98



SPACE SHUTTLE MISSION STS-90 LAUNCH COUNTDOWN TO BEGIN APRIL 13

NASA will begin the countdown for launch of Space Shuttle Columbia on mission STS-90 on April 13 at 2 a.m. EDT at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center.

The countdown includes 41 hours and 19 minutes of built-in hold time leading to a launch time of 2:19 p.m. EDT on April 16. The launch window extends for 2 hours and 30 minutes.

STS-90 is the second Space Shuttle mission this year. This will be the 25th flight of the orbiter Columbia and the 90th flight overall in NASA's Space Shuttle program. STS-90 is currently scheduled to last 16 days, 21 hours, 48 minutes, which includes a one-day mission extension. The option to extend the mission will be addressed during the flight based on available consumables. Columbia is scheduled to land at KSC at 11:07 a.m. on May 3.

Columbia was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 3 on March 16 and then mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was transported to Pad 39B on March 23.

On the STS-90 Neurolab mission, Columbia will carry a seven member crew into orbit to participate as "test subjects" in complex neurological research. Along with the astronauts, mice, crickets, fish, snails and rats will be used in this advanced study of human and animal neurological systems. Neurolab will examine the effects of spaceflight on the brain, spinal cord, peripheral nerves and sensory organs in the human body.

The STS-90 crew consists of: Commander Richard Searfoss, Pilot Scott Altman, Mission Specialists Rick Linnehan, Kay Hire, Dave Williams of Canada, and Payload Specialists Jay Buckey and James Pawelczyk.

The crew is scheduled to arrive at KSC at about 3:30 p.m., Monday, April 13. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES

*all times are Eastern

Launch - 3 Days (Monday, April 13)

- Prepare for the start of the STS-90 launch countdown
- Perform the call-to-stations (1:30 a.m.)
- All members of the launch team report to their respective consoles in Firing Room 3 in the Launch Control Center for the start of the countdown
- Countdown begins at the T-43 hour mark (2 a.m.)
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Columbia's general purpose computers
- Begin stowage of flight crew equipment
- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
- Activate and test navigational systems
- Complete preparations for loading of power reactant storage and distribution system

Enter first planned built-in hold at T-27 hours for duration of four hours (6 p.m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers
- Open launch pad to personnel supporting PRSD load

Resume countdown (10 p.m.)

- Begin operations to load cryogenic reactants into Columbia's fuel cell storage tanks and extended duration orbiter (EDO) tanks located in the orbiter's payload bay (10 p.m. - 10 a.m.)

Launch - 2 Days (Tuesday, April 14)

Enter eight-hour built-in hold at T-19 hours (6 a.m.)

- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs

Resume countdown (2 p.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Neurolab late stow begins
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 25 hours, 59 minutes (10 p.m.)

Launch - 1 Days (Wednesday, April 15)

- Neurolab late stow complete
- Activate the orbiter's flight controls and navigation systems
- Begin startracker functional checks
- Activate orbiter's inertial measurement units
- Install film in numerous cameras on the launch pad
- Activate the orbiter's communications systems
- Flight crew equipment late stow
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down

- Move Rotating Service Structure (RSS) to the park position (8 p.m.)
- Perform orbiter ascent switch list in crew cabin
- Start fuel cell flow-through purge

Resume countdown (11:59 p.m.)

Launch Day (Thursday, April 16)

- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Columbia's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned one-hour built-in hold at the T-6 hour mark (4:59 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel

Resume countdown (5:59 a.m.)

- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 5:30 a.m.)
- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 8:30 a.m.)

Enter planned two-hour built-in hold at T-3 hours (8:59 a.m.)

- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Close-out crew and Final Inspection Team proceed to Launch Pad 39B

Resume countdown at T-3 hours (10:59 a.m.)

- Perform open loop test with Eastern Range
- Crew departs Operations and Checkout Building for the pad (about 11:04 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 11:34 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Columbia's crew hatch (about 12:49 p.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (1:39 p.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (1:49 p.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 10-minute hold at T-9 minutes (2:00 p.m.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (2:10 p.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-6:15)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-90

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours Mon.	4 hours	6:00 p.m. Mon.	10:00 p.m.
T-19 hours Tues.	8 hours	6:00 a.m. Tues.	2:00 p.m.
T-11 hours Tues.	25 hours, 59 minutes	10:00 p.m. Tues.	11:59 p.m. Wed.
T-6 hours Thurs.	1 hour	4:59 a.m. Thurs.	5:59 a.m.
T-3 hours Thurs.	2 hours	8:59 a.m. Thurs.	10:59 a.m.
T-20 minutes Thurs.	10 minutes	1:39 p.m. Thurs.	1:49 p.m.
T-9 minutes Thurs.	10 minutes	2:00 p.m. Thurs.	2:10 p.m.

CREW FOR MISSION STS-90

Commander (CDR): Richard Searfoss
 Pilot (PLT): Scott Altman
 Mission Specialist (MS1): Rick Linnehan
 Mission Specialist (MS2): Kay Hire
 Mission Specialist (MS3): Dave Williams
 Payload Specialist (PS1): Jay Buckey
 Payload Specialist (PS2): James Pawelczyk

SUMMARY OF STS-90 LAUNCH DAY CREW ACTIVITIES

Thursday, April 16

7:00 a.m. Wake up
7:30 a.m. Breakfast
* 9:54 a.m. Crew photo
10:24 a.m. Weather briefing (CDR, PLT, MS2)
10:24 a.m. Don launch and entry suits (MS1, MS3, PS)
10:34 a.m. Don launch and entry suits (CDR, PLT, MS2)
*10:50 a.m. Suit up photo
*11:04 a.m. Depart for launch pad 39B
*11:34 a.m. Arrive at white room and begin ingress
*12:49 p.m. Close crew hatch
* 2:19 p.m. Launch

**Televised events (times may vary slightly)*

All times Eastern

-- end --

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

April 15, 1998

KSC Contact: George H. Diller

KSC Release No. 49-98



SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

For the Space Shuttle, weather "outlooks" provided by the U. S. Air Force Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days in coordination with the NOAA National Weather Service Spaceflight Meteorology Group (SMG) at the Johnson Space Center in Houston. These include weather trends and their possible effects on launch day. A formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

Launch weather forecasts, ground operations forecasts, and launch weather briefings for the Mission Management Team and the Space Shuttle Launch Director are prepared by the Range Weather Operations Facility. Forecasts which apply after launch are prepared by SMG. These include all emergency landing forecasts and the end of mission forecasts briefed by SMG to the astronauts, the Flight Director and Mission Management Team.

During the countdown, formal weather briefings occur approximately as follows:

- L-24 hr 0 min: Briefing for Flight Director and astronauts
- L-21 hr 0 min: Briefing for removal of Rotating Service Structure
- L-9 hr 00 min: Briefing for external tank fuel loading
- L-4 hr 30 min: Briefing for Space Shuttle Launch Director
- L-3 hr 55 min: Briefing for astronauts
- L-2 hr 10 min: Briefing for Flight Director
- L-0 hr 35 min: Briefing for launch and RTLS
- L-0 hr 13 min: Poll all weather constraints

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

- a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.
- b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table

becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	Relative Humidity				
	(kts)	0-64%	65-74%	75-79%	80-89%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 34 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies and may be as low as 20 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.
- Launch will not occur if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch, unless the source of lightning has moved more than 10 nautical miles away from the pad or the flight path.
- The one-minute average of the electric field mill network, used to measure electric fields, shall not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad at any time within 15 minutes prior to launch.

The above rule need not apply if the following two conditions are observed to exist:

1. There are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.
2. A known source of electric fields such as ground fog, smoke or "sunrise effect" is occurring near the field mill which are conditions previously determined and documented to be benign and is clearly causing the elevated readings.

Clouds: (types known to contain hazardous electric fields)

- The Space Shuttle may not be launched if the planned flight path is through a layer of clouds with a thickness of 4,500 feet or greater where the temperature of any part of the layer is between 32 degrees F. and -4 degrees F.
- The Space Shuttle may not be launched if the planned flight path is through a cumulus type cloud with its top between the 41 degrees F. temperature level and 23 degrees F. temperature. Launch may occur if: 1) the cloud is not producing precipitation; 2) the distance from the furthest edge of the cloud top to at least one operating field mill is less than the altitude at the 23 degree F temperature level or 3 nautical miles, whichever is less; 3) field mill readings within five nautical miles of the flight path must be between -100 volts per meter and +1000 volts per meter.
- The Space Shuttle may not be launched through 1) cumulus type clouds with tops higher than the 23 degree F. temperature level; 2) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 3) through or within 10 nautical miles of the nearest edge of any cumulonimbus or thunderstorm cloud including nontransparent parts of its anvil; 4) through or within 10 nautical miles of the nearest edge of a nontransparent detached anvil cloud for the first hour after detachment from the parent thunderstorm or cumulonimbus cloud.
- The Space Shuttle may not be launched if the flight path is through any clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation within five nautical miles of the flight path.
- The Space Shuttle may not be launched if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected or observed.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				July			
Temp	Low	Avg	High	Temp	Low	Avg	High
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- Direct visual observation of the Shuttle is required through 8,000 feet. This requirement may be satisfied using optical tracking sites or a forward observer
- For cloud ceilings of any thickness between 6,000 feet and 8,000 feet the following conditions must be met for launch to occur:

a.) the vehicle integrity can be observed without interruption through 6,000 feet.

b.) all required Range Safety instrumentation is functioning properly

c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

- For cloud ceilings between 4,000 feet and 6,000 feet the following conditions must be met for launch to proceed:

a.) the thickness of the clouds must be less than 500 feet

b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8,000 feet

c.) all required Range Safety instrumentation is functioning properly

d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A "**Good Sense Rule**" is in effect for launch which states: "Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY FLIGHT RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTL), landings at the Trans-Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). These forecasts are prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston and briefed by them to the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTL with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required. For TAL sites, cloud coverage 4/8 or less below 5,000 feet and a visibility of 5 statute miles or greater are required.
- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability.
- For the RTL site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- An RTL rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:

a.) The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have

not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels within and below the clouds.

- b.)** Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading alignment circles are clear of showers.
- c.)** The movement of the showers is observed to be consistent and no additional convective development is forecast.
- d.)** Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a.) above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.
- Headwind not to exceed 25 knots.
- Tailwind not to exceed 10 knots average, 15 knots peak.
- Turbulence conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

The end of mission landing weather forecast is prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston for the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions. Decision time for the deorbit burn is 70 - 90 minutes before landing. The weather criteria are:

- Cloud coverage of 4/8 or less below 8,000 feet and a visibility of 5 miles or greater required.
- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 18 days the limit is 12 knots, day and night.
- Headwind cannot exceed 25 knots.
- Tailwind cannot exceed 10 knots average, 15 knots peak.
- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.
- Turbulence must be less than or equal to moderate intensity.
- Consideration may be given for landing with a "no go" observation and a "go" forecast if at decision time analysis clearly indicates a continuing trend of improving weather conditions, and the forecast states that all weather will be met at landing time.

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

- **Radar:** Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radar. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.
- **Field Mill Network:** Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.
- **Lightning Detection System:** Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurrence.
- **Lightning Detection And Ranging (LDAR):** Developed by NASA at the Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.
- **National Lightning Detection Network:** Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.
- **Rawinsonde:** A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.
- **Jimsphere balloon:** A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.
- **Doppler Radar Wind Profiler:** Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another Jimsphere balloon is released.
- **Rocketsonde:** A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and

370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.

- **Satellite Images and Data:** Provided directly to the satellite terminal at USAF Range Weather Operations and NOAA National Weather Service Spaceflight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.
- **Meteorological Interactive Data Display System (MIDDS):** Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.
- **Towers:** 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short-term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.
- **Buoys:** Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.
- **Solid Rocket Booster Retrieval Ships:** These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.
- **Weather Reconnaissance Aircraft:** A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

GO TO THE [KSC PRESS RELEASES](#) HOME PAGE



April 16, 1998

KSC Contact: George Diller/Bruce Buckingham

KSC Release No. 50-98



STS-90 COLUMBIA/NEUROLAB LAUNCH POSTPONED 24 HOURS

The launch of Space Shuttle Columbia on STS-90 with Neurolab has been postponed 24 hours due to difficulty with network signal processor No. 2 on the orbiter. This device formats data and voice communications between the ground and the Space Shuttle. Two network signal processors are required for launch and landing and are also highly desirable for on-orbit mission operations. The unit, which is located in the orbiter's middeck, will be removed and replaced today.

The weather forecast continues to reflect a zero percent chance of not meeting the launch weather criteria on Friday. The planned launch time for Columbia continues to be 2:19 p.m. EDT at the opening of a 2 1/2 hour window.

Launch commentary on NASA Television will begin at 8 a.m. Friday.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

April 17, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 51-98



Note to Editors:

MANATEES TO BE RELEASED INTO BANANA RIVER FROM KSC'S KARS PARK

Three manatees rescued from a storm drain in Cocoa Beach will be released into the Banana River on Monday, April 20 from KARS Park I, located south of KSC on Merritt Island.

The three female manatees were in fair condition when they were found trapped in a storm drain under 750 N. Atlantic Ave., Cocoa Beach. One was rescued on Oct. 29, 1997, and the other two were rescued on Feb. 11 this year. All three recuperated at Sea World of Florida in Orlando.

The release will be at about 10 a.m. Monday from a boat ramp in the southwest corner of the Banana River which runs through KARS Park I. It is hoped that the manatees will head north through a no-motor zone where they will be safe from injury by boat propellers.

Agencies cooperating in the rescue and release, besides Sea World, are the U.S. Fish and Wildlife Service, the Merritt Island National Wildlife Refuge and the Florida Department of Environmental Protection.

For more information, contact:

U.S. Fish and Wildlife Service

Robert Turner -- 904-232-2580, ext. 117

Jim Valade -- 904-232-2580, ext. 118

Florida Department of Environmental Protection

Ann Spellman -- 407-953-5037

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

April 21, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 52-98



DAUGHTERS' DAY SCHEDULED FOR KSC EMPLOYEES APRIL 23

NASA and contractor employees at Kennedy Space Center have an opportunity to bring their daughters to work April 23 as part of "Take Our Daughters to Work Day."

The theme this year is "Imagine a Day," representing the idea behind the public education program to encourage young women to pursue their career of choice and break down gender and racial barriers. This is KSC's sixth year celebrating the event in concert with the Ms. Foundation for Women, Inc., as part of a national effort to inspire young women.

The day will begin at 8 a.m. in KSC Visitor Complex IMAX II Theater. KSC Director Roy Bridges will kickoff the special program for NASA employees' daughters. Contractor and NASA employees may attend another program at the complex beginning at 9:30 a.m. featuring a robotics demonstration. Participants then will go to the parents' work areas for the rest of the day.

Daughters who are nine years of age or older are eligible to participate and will receive special badges for entrance into KSC. Although most children will be accompanied by a parent, sponsors can be another family member or KSC worker. Due to safety requirements, certain operational areas will be off-limits to visitors.

A "Take Our Sons to Work Day" is currently planned for June 11.

NOTE TO EDITORS: News media representatives wishing to cover the event should contact the KSC News Center to coordinate photo opportunity times.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

April 23, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 53-98



MORGAN BECOMES FIRST WOMAN TO RECEIVE DEBUS AWARD

Senior Kennedy Space Center manager and seasoned spaceflight veteran JoAnn H. Morgan has been named the first woman to receive the prestigious Kurt S. Debus Award.

Morgan was selected from a field of 18 nominees by a special committee of former winners. Bestowed annually by the National Space Club, the Debus Award is named after Dr. Kurt Debus, the first director of Kennedy Space Center and a pioneer in the U.S. human spaceflight program. The 1998 award and a trophy will be presented to Morgan at a black tie dinner on Friday, May 15, at the Radisson Resort in Cape Canaveral. NASA Deputy Administrator Joseph Rothenberg will be the guest speaker.

"I am sure you are aware from your years of involvement with aerospace that the Debus Award is one of the most prestigious honors bestowed by the Florida aerospace community upon those whose leadership and contributions have advanced America's space program," Dick Jolley, chairman of the Florida Committee of the National Space Club, told Morgan in the letter notifying her of the distinction.

"To be named the recipient of the Debus Award represents one of the greatest honors I could imagine," Morgan said. "I began working in the space program in Huntsville for the Army Ballistic Missile Agency, where Dr. Debus also worked. I was first assigned to the Missile Firing Laboratory at Cape Canaveral, and Dr. Debus, among others, shaped the early part of my career here in Florida for many years. He was a giant in the field of aerospace, and to receive an award recognizing his legacy is beyond belief."

Morgan is the KSC Associate Director for Advanced Development and Shuttle Upgrades. Named to this position in June 1997, she is a member of a three-person executive team reporting directly to the center director. In this capacity, she provides leadership in advanced development and Shuttle upgrades, creating a customer-driven environment and new opportunities for the Kennedy team to participate in cutting-edge development.

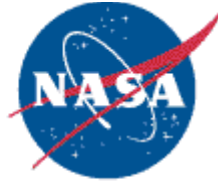
Previously, she was the Director for Safety and Mission Assurance with overall responsibilities for the KSC safety, reliability, maintainability, quality, and mission assurance programs, and worked in the KSC Payload Operations Directorate for ten years where she was Director of Payload Projects and Ground Operations.

Morgan was the first woman senior executive at KSC. During her more than 35 years in the U.S. manned space flight programs, Morgan has received many honors and awards, including an achievement award during the activation of Apollo Launch Complex 39, four Exceptional Service Medals, and the Sloan Fellowship for graduate study at Stanford

University. She was also awarded an Outstanding Leadership Medal in 1991. In 1994, she received the Society of Women Engineer's National Upward Mobility Award, and the American Society of Mechanical Engineers J. Tal Webb Award. In 1995, she was recognized as a Meritorious Executive by the President. Also in November 1995, she was selected by the Governor of Florida for induction into the Florida Women's Hall of Fame. In 1997, she was inducted into Tau Beta Phi, the national engineering society, as an "eminent engineer," after being nominated by officials and students of the University of Central Florida's Engineering School.

Morgan's career spans four decades of spaceflight since her first job at Cape Canaveral in 1958 as a student employee engineer's aide. She is originally from Huntsville, Ala., and currently resides in Titusville.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

May 1, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 54-98



Note to Editors:

COLUMBIA SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-90

The orbiter Columbia is scheduled to land at Kennedy Space Center on Sunday, May 3 at 12:09 p.m. EDT completing its 16-day STS-90 mission which was launched from KSC on April 17.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 256 at mission elapsed time 15 days, 21 hours, 50 minutes. Deorbit burn will occur at about 11:11 a.m. Sunday.

The two KSC landing opportunities on Sunday are: 12:09 p.m. and 1:43 p.m. EDT. Managers have decided not to call up the back-up landing location at Edwards Air Force Base (EAFB), CA, for a landing attempt on Sunday.

If managers must keep Columbia in orbit an additional day, two landing opportunities are available on Monday at KSC and two at EAFB.

KSC Monday landing times are: 12:04 p.m. and 1:38 p.m. EDT.

EAFB Monday landing times are: 1:30 p.m. and 3:04 p.m. EDT.

This landing of Columbia will mark the 43rd landing at KSC in the history of Space Shuttle flight. It will be the 14th consecutive landing at KSC and the 21st in the last 22 shuttle flights. Columbia is currently on the 90th Space Shuttle mission in the history of the program.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Columbia April 17. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the

orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC Monday.

If Columbia lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 10 hours after Columbia lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 3 for post-flight deservicing. Operations in OPF bay 3 will be made to prepare Columbia for its next Space Shuttle mission, STS-93, currently scheduled for launch in December 1998.

-- end --

NOTICE TO EDITORS: The KSC press site will be open Saturday, May 2, from 8 a.m. - 2 p.m. On landing day, Sunday, May 3, the office will be open from 8 a.m. - 9 p.m. Media wishing to view Columbia's landing should be at the KSC press site between 9 - 11 a.m. Sunday, for transport to the SLF. Accreditation must be arranged in advance. Additional specific information regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours is available at the KSC News Center. Recorded status of KSC Space Shuttle launch and landing operations can be reached by calling 407-867-2525.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

May 3, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 55-98



Note to Editors:

MEDIA OPPORTUNITY WITH STS-91 CREW SET FOR THIS WEEK'S TCDT

The crew of Space Shuttle mission STS-91 will be at Kennedy Space Center this week for the Terminal Countdown Demonstration Test (TCDT).

The TCDT is held at KSC prior to each Space Shuttle flight, providing the crew of each mission an opportunity to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cut-off. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The six-member crew of mission STS-91 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 3:30 p.m. Monday, May 4. Media who desire to view crew arrival should be at the KSC Press Site by 2 p.m. for transport to the SLF.

On Wednesday, May 6, news media representatives will have an opportunity to speak informally with and photograph the crew at Pad 39A. Media interested in participating in this question and answer session should be at the KSC Press Site by 12:30 p.m. Wednesday for transport to the pad. This question and answer session will be a local media event only. However, it will be replayed on NASA TV later in the afternoon.

On Thursday, the entire crew will take part in simulated launch day events. At the pad, the crew will enter the orbiter Discovery fully suited for the simulated Shuttle main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Discovery is targeted for launch on June 2 at about 6:10 p.m. EDT. STS-91 is scheduled to last about 10 days and will feature the final docking of the Space Shuttle to Russia's Mir Space Station. Discovery will return to Earth with astronaut Andy Thomas who has been on Mir since January.

Crew members for mission STS-91 are: Commander Charles Precourt; Pilot Dominic Gorie; and Mission Specialists Wendy Lawrence, Franklin Chang-Diaz, Janet Kavandi and Valery Ryumin.

Go to the [KSC Press Releases](#) Home Page



STS-91 Discovery 9th and Last Shuttle-Mir Docking

KSC Release No. 56-98
May 1998

[STS-91 images](#)

More than two years of the continuous presence of a U.S. astronaut aboard the Russian Mir space station will end during the STS-91 mission when NASA astronaut Andrew S. W. Thomas transfers to the Space Shuttle Orbiter Discovery during docking operations. This final docking mission will also conclude Phase I of the International Space Station (ISS) program. Three other major highlights of this Shuttle flight are the first docking mission for the Space Shuttle Orbiter Discovery, the first on-orbit test of the Alpha Magnetic Spectrometer (AMS), an experiment scheduled to fly aboard the ISS, and the first flight of the new Space Shuttle super lightweight external tank.

The 10-day mission will begin when Discovery lifts off from Launch Pad 39A on its 24th space flight during a 7-to-10-minute window and enters an orbit of 160 miles and an inclination of 51.6 degrees to the Earth's equator. The orbiter will then rendezvous with Mir at an altitude of 213 nautical miles and dock on Flight Day 3. Thomas will board Discovery for the return flight home within hours after the hatches between the two 100-ton spacecraft are opened. The docking operations, which will include the transfer of over a ton of Russian supplies and logistics equipment to Mir from a SPACEHAB Single Module in the orbiter's payload bay and water from its fuel cells, will continue for four days. When docking operations are complete, Discovery will undock and prepare for its return to Earth. Weather permitting, the orbiter will touch down at KSC's Shuttle Landing Facility to conclude the 91st Shuttle mission.



The Crew

One Russian cosmonaut and six American astronauts will make up the STS-91 crew. Five crew members have previously flown in space.

Mission Commander Charles J. Precourt (Col., USAF) is on his fourth space flight and third trip to Mir, having served as commander on STS-84, pilot on STS-71 and mission specialist on STS-55. His flight experience includes over 6,500 hours in more than 50 types of civil and military aircraft.

Pilot Dominic L. Pudwill Gorie (Cdr., USN) is on his first Shuttle mission. He flew combat missions in Operation Desert Storm and has earned a Distinguished Flying Cross as well as a master's degree in aviation systems.

Mission Specialist Wendy B. Lawrence (Cdr., USN) is on her third Shuttle mission and second trip to Mir. She was a mission specialist on STS-86, the seventh Mir docking flight, and STS-67. She has served as Director of Operations for NASA at the Gagarin Cosmonaut Training Center in Star City, Russia, and has also trained for a Shuttle/Mir flight.

Mission Specialist Franklin R. Chang-Diaz (Ph.D.) is on his sixth space flight. He holds a doctorate in applied plasma physics and is director of the Advanced Space Propulsion Laboratory at the University of Houston.

Mission Specialist Janet Lynn Kavandi (Ph.D.) is on her first Shuttle flight. She was selected as an astronaut candidate in 1994. She holds a doctorate in analytical chemistry and has received two patents.

Mission Specialist and Russian Cosmonaut Valery Victorovitch Ryumin is director of the Russian Shuttle-Mir program and has been flight director for the Salyut-7 and Mir space stations. He is a veteran of three space flights and has logged a total 362 days in space.

Mission Specialist Andrew S. W. Thomas (Ph.D.) began his stay on Mir Jan. 25 during the STS-89 mission. He had flown before as payload commander on STS-77. The Australian-born scientist was selected as an astronaut candidate in 1992. He was previously a Jet Propulsion Laboratory employee who became leader of that center's program for microgravity materials processing in space.

Shuttle-Mir Program leads to ISS

When Thomas leaves Mir during STS-91, he will be ending Phase I of the U.S.-Russian program that has led to significant gains in advanced technology, earth sciences, fundamental biology, human life sciences, microgravity and ISS Risk Mitigation research that began when U.S. astronaut Shannon Lucid boarded the Russian space station on March 24, 1996, during the STS-76 mission. With Thomas' departure, NASA astronauts will have lived and worked with their Russian crewmates continuously for more than 800 days.

The international cooperation and on-going scientific research conducted aboard the Shuttle orbiter and by the U.S. and Mir crew members during the ISS Phase I Program have been considered by both countries to be laying the foundation for the construction and operation of the ISS. Construction of the ISS is scheduled to begin this year. One of the goals of the Shuttle-Mir missions has been to understand more fully how to operate an international space station, providing researchers from all over the world access to laboratory facilities in space.



Alpha Magnetic Spectrometer (AMS)

One of the most perplexing and profound questions yet to be answered about the universe is why it seemingly contains no large amounts of antimatter. Another is where or how the 90 percent or more of its "missing mass" exists. By measuring the amount of antimatter nuclei present in cosmic rays with much higher precision than ever before while looking at the energy spectra of positrons (electron antiparticles) and antiprotons to help determine the nature of dark matter, the AMS will provide data that could provide scientists with solutions for both of these puzzles. The experiment will also measure normal matter cosmic and gamma rays. The 7,050-pound AMS will fly aboard Discovery attached to a 2,150-pound Unique Support Structure (USS) in the orbiter's payload bay. The AMS will employ a unique, 4,200-pound, rare-earth neodymium-iron-boron permanent magnet that will produce a strong uniform magnetic field, along with a state-of-the-art spectrometer, to search for antimatter, dark matter and to understand cosmic ray propagation. The AMS will be the first large magnet experiment ever to be flown in space and could be the first experiment to detect minute quantities of antimatter in cosmic rays coming from outside our galaxy. This antimatter could be an indication of the existence of antimatter galaxies. The AMS is scheduled to operate for 100 hours during the STS-91 mission and will send data to, and be controlled from, the ground. Data will also be recorded on computer hard drives by the crew. This first flight is designed to verify AMS performance under actual space conditions prior to its three-year deployment on the ISS. The AMS is an international collaborative project that involves 37 research institutions in 12 countries and the United States. The U.S. portion of the experiment is sponsored by the Department of Energy. The NASA portion of the AMS program is managed by the agency's Office of Space Science and Office of Life and Microgravity Sciences and Applications. . Mir Supplies and Experiments

The SPACEHAB Single Module in Discovery's payload bay will serve as the means to transport approximately 2,600 pounds of Russian logistics items to the Mir, including storage batteries, food and water containers, clothing, sleeping and personal hygiene articles. More than 1,400 pounds of water will also be supplied from Discovery's fuel cells. Other equipment includes the hardware for four ISS Risk Mitigation Experiments (RMEs) that will be conducted aboard Mir, as well as advanced technology, microgravity and five NASA Human Life Sciences (HLS) investigations.

Some experiment hardware will be removed from Mir and transferred to Discovery to be returned to Earth, including the Space Acceleration Monitoring System (SAMS), the Queens University Experiment in Liquid Diffusion (QUELD); Co-Culture (COCULT) biotechnology experiment to research the growth and development of human tissue; the Diffusion Controlled Crystallization Apparatus for Microgravity (DCAM); and Protein Crystal Growth (PCG) GN2 Dewar experiment.

Other Shuttle Payloads

In addition to the SPACEHAB Module and the AMS, Discovery's payload bay will be the site where eight Get-Away Special (GAS) experiments are conducted. They include the NASA-sponsored educational Space Experiment Module (SEM) and other GAS experiments that will conduct research in areas of biology, materials science, gamma rays, oil recovery and space dust. The Cosmic Radiation Effects and Activation Monitor (CREAM), Radiation Monitoring Equipment III (RME-III), Solid Surface Combustion Experiment (SSCE) and Commercial Protein Crystal Growth (CPCG) investigations will be conducted in the middeck crew cabin area while Discovery is in orbit. An experiment will also be conducted with the orbiter's thrusters and ground-based radar to study their effects on the ionosphere.



Super Lightweight External Tank

The first Space Shuttle superlightweight external tank (ET) will provide the liquid hydrogen fuel and liquid oxygen oxidizer for Discovery's three main engines during the STS-91 liftoff and ascent. This lightweight ET was developed to increase the Shuttle payload capacity on ISS flights. The tank is externally identical to, but 7,500 pounds lighter than, conventional metal alloy ETs. The weight reduction is due to the use of aluminum lithium internal liquid hydrogen and liquid oxygen tanks.

GO TO THE [KSC FACT SHEETS](#) HOME PAGE

GO TO THE [KSC PRESS RELEASES](#) HOME PAGE



JOHN F. KENNEDY SPACE CENTER

May 14, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 57-98



Note to Editors:

FIRST SUPER LIGHTWEIGHT EXTERNAL TANK SET FOR PRE-LAUNCH TEST; LOCAL MEDIA BRIEFING SCHEDULED FOR FRIDAY, MAY 15

Engineers at Kennedy Space Center will conduct a prelaunch cryogenic test of the Space Shuttle's first super lightweight external tank (SLWT) on Monday, May 18 beginning at 7 a.m. The tank, mated to the orbiter Discovery at Pad 39A, is scheduled for launch on mission STS-91 on June 2.

A local KSC press conference is scheduled for 3 p.m. Friday, May 15 to discuss the objectives of the tanking test and to give an overview of the development of the SLWT.

Participants in the briefing are Dave King, KSC Launch Director, and Parker Counts, External Tank Project Manager, Marshall Space Flight Center. The briefing will be held at the KSC Press Site Auditorium and will be a local event only. Media who are unable to attend the briefing can listen by calling the V-circuits at 867-1220, 1240, or 1260.

The tanking test begins with a call-to-stations on Saturday, May 16 as console operators and engineers gather in the Launch Control Center to prepare the Shuttle and the SWLT for the loading of cryogenic propellants. The fully instrumented SLWT will be closely monitored throughout the test which is scheduled to conclude late Monday afternoon with a staged Ground Launch Sequence (GLS) cut-off during a simulated countdown.

The primary difference in this test from standard pre-launch tanking operations is that the liquid oxygen and liquid hydrogen propellants will not be loaded simultaneously, but one after the other. For this reason the tanking test will take longer than a typical pre-launch tanking.

The primary objectives of the test are to evaluate the strut loads between the tank and the solid rocket boosters and to verify the integrity of the new components of the tank. The liquid oxygen and liquid hydrogen tanks are made of aluminum lithium - a lighter, stronger material than the metal alloy used in the original tanks.

The improved tank is more than 7,000 pounds lighter than its predecessors and was developed to increase the Shuttle payload capacity on International Space Station assembly flights. The external tank holds a maximum of 143,351 gallons of liquid oxygen and 385,265 gallons of liquid hydrogen.

Live commentary of the tanking test will be broadcast only to the KSC Press Site beginning at 7 a.m. Monday and extend through the final phases of the cryogenic loading operations, which are expected to be complete by about 1 p.m.

For purposes of this test, the KSC Press Site will be open at 6:30 a.m. Monday. Media requiring credentials should contact the KSC Press Site by close of business Friday, May 15.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

April 1, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 60-98



TRACE SOLAR SPACECRAFT SUCCESSFULLY LAUNCHED

After a successful launch at 6:42 p.m. PST today, NASA's Transition Region and Coronal Explorer (TRACE) spacecraft, has been placed in a 324 by 352 nautical mile (518 by 563 kilometer) Sun synchronous orbit. TRACE was launched into orbit on an Orbital Sciences Corp. Pegasus-XL rocket that was released from an L-1011 jet aircraft at the Western Range, Vandenberg Air Force Base, CA.

The TRACE spacecraft will greatly improve understanding of events in the Sun's atmosphere, including intense storms and flares, which can have an impact on power and communications systems on Earth.

NASA's newest spacecraft will join a fleet of spacecraft studying the Sun during a critical period when solar activity is beginning its rise to a peak early in the new millennium. The Sun goes through an 11-year cycle from a period of numerous intense magnetic fields and sunspots to a period of relative calm and then back again. Over the next year it is anticipated that solar activity will rise from a period of relative quiet to a period of near maximum, allowing TRACE scientists an unique opportunity to examine the full range of solar variability. This will give TRACE the chance to study the full range of solar conditions, even in its relatively short planned lifetime.

"We are very pleased with the successful deployment of the TRACE spacecraft this evening," said Jim Watzin, SMEX Project Manager from the Goddard Space Flight Center in Greenbelt, Md. Initially, we will be watching to ensure that the health of the spacecraft is stable and that the proper spacecraft attitude and power conditions are established. Then over the course of the next 13 days, we will deploy and configure the spacecraft to begin the science investigations. We expect the scientists will start their work in about a month," he said.

TRACE is the third in a series of missions in NASA's Small Explorer (SMEX) Project developed by Goddard. The SMEX satellites are small observatories that are being used to support quick response astrophysics and space physics investigations, as well as to develop new low cost approaches for improving satellite productivity in space research," said Watzin. Goddard manages the SMEX Project which is part of the Explorers Program.

TRACE will train its powerful telescope on the so-called 'transition region' of the Sun's atmosphere, a dynamic region between the relatively cool surface and lower atmosphere regions of the Sun and the extremely hot upper atmosphere levels called the corona. Using instruments sensitive to extreme-ultraviolet and ultraviolet wavelengths of light, TRACE will study the detailed connections between the fine scale surface magnetic features and the overlying, changing atmospheric structures of hot, ionized gas called plasma. The surface features and atmospheric structures are linked in ways currently unknown. The power of the TRACE telescope to unravel this problem makes this observatory unique among the current group of spacecraft studying the Sun.

The TRACE science team also will study the evolution of events, such as massive flarings and huge eruptions, in the Sun's atmosphere. These events originate at the Sun's visible surface, the photosphere, and travel upward through its atmosphere (chromosphere and transition region) and then into its super-hot corona before speeding out into space, sometimes towards Earth. These events are often associated with storms of charged particles that can potentially

damage or degrade spacecraft that lie in the path from the Sun to the Earth.

The NASA spacecraft will be placed in a polar orbit to enable virtually continuous observations of the Sun, uninterrupted by the Earth's shadow for months at a time. This orbit will give the mission the greatest chance of observing the random processes which lead to flares and massive eruptions in the Sun's atmosphere. The science data from TRACE will be directly downlinked to several ground stations. These include Poker Flat, Alaska, and the NASA Goddard Wallops Flight Facility, VA.

The TRACE telescope was designed and developed by the Stanford Lockheed Institute for Scientific Research (SLISR) in Palo Alto, Calif., a cooperative institute that combines the talents of Lockheed Martin and Stanford University, Montana State University and the Smithsonian Astrophysical Observatory located in Cambridge, MA.

The spacecraft is intended to operate at least for one year.

Information on the TRACE mission can be obtained via the Internet World Wide Web at URL:

<http://sunland.gsfc.nasa.gov/smex/trace>. TRACE science information can be found at:

<http://www.space.lockheed.com/TRACE/welcome.html>.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

May 19, 1998

KSC Contact: Joel Wells

KSC Release No. 61-98



DISCOVERY LAUNCH TO MIR ON MISSION STS-91 SET FOR JUNE 2

Shuttle managers today selected June 2 as the official date for the launch of Shuttle Discovery on the ninth planned docking mission with the Russian Space Station Mir. The flight, designated STS-91, will deliver logistics and supplies to Mir and also will bring home NASA Astronaut Andrew Thomas, the seventh and final NASA astronaut to serve as a Mir crew member, who has been on the orbiting station since late January.

Discovery's launch on June 2 will occur from Kennedy Space Center Launch Complex 39A. The current launch time of 6:10 p.m. EDT may vary slightly based on calculations of Mir's precise location in space at the time of liftoff due to Shuttle rendezvous phasing requirements. The STS-91 mission is scheduled to last 9 days, 19 hours, 53 minutes. An on-time launch on June 2 and nominal mission duration would have Discovery landing back at Kennedy Space Center on June 12 at 2:03 p.m. EDT

Today's launch date decision follows completion of the Flight Readiness Review at KSC by Shuttle managers from NASA and prime contractor United Space Alliance.

The launch team is evaluating a minor overboard water leak from the fuel cell No. 3 relief valve to determine its acceptability for flight. The leak was first seen during Monday's super lightweight tank test when the fuel cell was brought on line to support tanking test operations.

"The nine joint Shuttle-Mir docking missions and the seven astronauts who served as station crew members have provided us with a wealth of insight and experience to be used as we begin construction of the International Space Station later this year," said George Abbey, Director of the Johnson Space Center, who chaired the review

STS-91 will be Discovery's 24th mission into space and the 91st Space Shuttle flight in the program's history.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

May 29, 1998

KSC Contact: Joel Wells

KSC Release No. 63-98



SPACE SHUTTLE MISSION STS-91 LAUNCH COUNTDOWN TO BEGIN MAY 30

NASA will begin the countdown for launch of Space Shuttle Discovery on mission STS-91 on May 30 at 9 p.m. EDT at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 1 of the Launch Control Center.

The countdown includes 26 hours and 10 minutes of built-in hold time leading to an opening of the launch window at about 6:05 p.m. on June 2. The launch window extends for 10 minutes. Managers are targeting a preferred launch time of about 6:10 p.m. However, an exact launch time will be determined during the T-9 minute hold after evaluating the orbital position of Russia's Mir space station.

This will be the third Space Shuttle mission of the year. STS-91 will mark the 24th flight of the orbiter Discovery and the 91st flight overall in NASA's Space Shuttle program. This is the ninth and final Shuttle flight planned to rendezvous and dock with Mir. STS-91 is currently slated to last 9 days, 19 hours, 53 minutes. Discovery is scheduled to land at KSC at 2:03 p.m. on June 12.

U.S. astronaut Andrew Thomas will join the other seven crew members aboard Discovery on Flight Day 3 following docking operations, ending more than four months of research onboard the space station. Discovery will undock from Mir on Flight Day 7. STS-91 features a series of firsts including Discovery's first time docking with Mir, the first on-orbit test of the Alpha Magnetic Spectrometer payload, and the first flight of NASA's super lightweight external tank. More than 3,000 pounds of supplies and water will be transferred to Mir during the four days of docking operations.

Discovery was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 2 on April 27 and then mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was transported to Pad 39A on May 2.

The STS-91 crew consists of: Commander Charles Precourt, Pilot Dominic Gorie, Mission Specialists Wendy Lawrence, Franklin Chang-Diaz, Janet Kavandi, Valery Ryumin of Russia and Andrew Thomas.

The crew is scheduled to arrive at KSC at about 12:30 p.m., Saturday, May 30. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES

*all times are Eastern

Launch - 3 Days (Saturday, May 30)

- Prepare for the start of the STS-91 launch countdown
- Perform the call-to-stations (8:30 p.m.)
- All members of the launch team report to their respective consoles in Firing Room 1 in the Launch Control Center for the start of the countdown
- Countdown begins at the T-43 hour mark (9 p.m.)
- Begin final vehicle and facility close-outs for launch
- Check out back-up flight systems
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Discovery's general purpose computers
- Begin stowage of flight crew equipment

Launch - 2 Days (Sunday, May 31)

- Inspect the orbiter's mid-deck and flight-deck and remove crew module platforms
- Activate and test navigational systems
- Complete preparations for loading of power reactant storage and distribution system

Enter first planned built-in hold at T-27 hours for duration of four hours (1 p.m.)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers
- Open launch pad to personnel supporting PRSD load

Resume countdown (5 p.m.)

- Begin operations to load cryogenic reactants into Discovery's fuel cell storage tanks (5 p.m. - 1 a.m.)

Launch - 1 Day (Monday, June 1)

Enter four-hour built-in hold at T-19 hours (1 a.m.)

- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs

Resume countdown (5 a.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 13 hours, 14 minutes (1 p.m.)

- Activate the orbiter's flight controls and navigation systems
- Begin startracker functional checks
- Activate orbiter's inertial measurement units
- Install film in numerous cameras on the launch pad
- Activate the orbiter's communications systems
- Flight crew equipment late stow
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down

Launch Day (Tuesday, June 2)

- Move Rotating Service Structure (RSS) to the park position (12:30 a.m.)
- Perform orbiter ascent switch list in crew cabin
- Start fuel cell flow-through purge

Resume countdown (2:14 a.m.)

- Activate the orbiter's fuel cells
- Configure communications at Mission Control, Houston, for launch
- Clear the blast danger area of all non-essential personnel
- Switch Discovery's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned two-hour built-in hold at the T-6 hour mark (7:14 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel

Resume countdown (9:14 a.m.)

- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 9:14 a.m.)
- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 12:14 p.m.)

Enter planned two-hour built-in hold at T-3 hours (12:14 p.m.)

- Align Merritt Island Launch Area (MILA) tracking antennas
- Perform inertial measurement unit preflight calibration
- Close-out crew and Final Inspection Team proceed to Launch Pad 39A

Resume countdown at T-3 hours (2:14 p.m.)

- Perform open loop test with Eastern Range
- Crew departs Operations and Checkout Building for the pad (about 2:19 p.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 2:49 p.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Discovery's crew hatch (about 4:04 p.m.)
- Begin Eastern Range final network open loop command checks
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (4:54 p.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (5:04 p.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 46-minute hold at T-9 minutes (5:15 p.m.)

(This is the final planned built-in hold. The countdown will resume to meet the preferred launch time of about 6:10 p.m. The exact launch time will be announced during this hold)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch
- Launch team determines time of launch

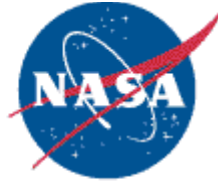
Resume countdown at T-9 minutes (at about 6:01 p.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)
- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-6:15)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-6.6 seconds)
- SRB ignition and liftoff (T-0)

CREW FOR MISSION STS-91

Commander (CDR): Charles Precourt
Pilot (PLT): Dominic Gorie
Mission Specialist (MS1): Franklin Chang-Diaz
Mission Specialist (MS2): Wendy Lawrence
Mission Specialist (MS3): Janet Kavandi
Mission Specialist (MS4): Valery Ryumin
Mission Specialist (MS5): Andrew Thomas (down)

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

May 29, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 64-98



Notice to Editors/News Directors:

MISSION STS-91 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the June 2 launch of the Space Shuttle Discovery on Mission STS-91, the 91st launch in the Shuttle program. The conferences and events (*as noted*) are scheduled to be carried live on NASA Television unless otherwise noted.

The six STS-91 crew members are scheduled to arrive at KSC on Saturday, May 30, at about 12:30 p.m. EDT. News media representatives planning to cover the event must be at the News Center by 11:30 a.m. Saturday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the KSC News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-91 mission credentials at the Pass and Identification Building on State Road 3 on Merritt Island during published times.

In addition to STS-91 mission briefings, other opportunities for media at KSC on the day before launch include: a live question and answer session with astronaut Andy Thomas on Mir beginning at 10:40 a.m.; a Phase 1/Phase 2 lessons learned briefing with NASA Shuttle\Mir program managers at 1:30 p.m.; and a tour of the Space Station Processing Facility (SSPF) and interviews with facility managers following the 2:30 p.m. pre-launch news conference. At the SSPF, NASA and contractor managers will be available to answer reporter's questions and for live interviews.

-- end of general release --

STS-91 BRIEFING & EVENTS SCHEDULE (all times are EDT)

(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV)

L-3 Days - Saturday, May 30

No briefings scheduled

STS-91 Flight Crew Arrival (Live on NASA TV) ----- 12:30 p.m.

(Launch countdown begins at 9 p.m.)

L-2 Days - Sunday, May 31

Countdown Status Briefing ----- 9 a.m.

- Doug Lyons, NASA Test Director
- Todd Corey, STS-91 Payload Manager
- Ed Priselac, Shuttle Weather Officer

L-1 Day - Monday, June 1

Countdown Status Briefing ----- 9 a.m.

- Jeff Spaulding, NASA Test Director
- Todd Corey, STS-91 Payload Manager
- Ed Priselac, Shuttle Weather Officer

In flight Q&A with Andy Thomas on Mir ----- 10:40 a.m.

(Q&A session will be split between three locations and last no longer than 30 minutes)

Phase One/Phase Two Lessons Learned News Conference ----- 1:30 p.m.

- Frank Culbertson, Phase One-Shuttle Mir Program Director
- Randy Brinkley, International Space Station Program Manager
- Mike Baker, Director Human Space Flight Programs, Russia

Pre-launch News Conference ----- 2:30 p.m.

- Tommy Holloway, Shuttle Program Manager, NASA, Johnson Space Center
- Dr. Arnauld Nicogossian, Assoc. Admin., for the Office of Life & Microgravity Sciences
- Frank Culbertson, Phase One-Shuttle Mir Program Director
- General Yuri Glazkov, Deputy Director, Gagarin Cosmonaut Training Center
- Martha Krebs, Director, Energy Research, Department of Energy
- Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
- Captain Chad Gibson, Staff Meteorologist, 45th Weather Squadron, USAF

NOTE: Following this news conference, a tour of the Space Station Processing Facility will be available to the media at KSC. The bus will depart from the press site about 10 minutes after the briefing ends. Participants at the SSPF include: Randy Brinkley, International Space Station Program Manager, NASA, JSC; Tip Talone, Director, International Space Station Hardware Integration, NASA, KSC; Steve Francois, Director, Space Station and Payload Processing, NASA, KSC; and Roy Tharpe, International Space Station Launch Site Manager, Boeing, KSC.

Launch Day - Tuesday, June 2

NASA Television live launch programming begins ----- 1 p.m.

Launch of Discovery ----- 6:10 p.m.

Post-launch Press Conference ----- Launch + 1 hour

- Donald R. McMonagle, Manager, Launch Integration for the Space Shuttle Program
 - Dave King, KSC Launch Director
-

KSC News Center office hours for STS-91 (hours may be adjusted for in-flight events)

Saturday, May 30----- (Launch minus 3 days) -----10 a.m. - 3 p.m.
Sunday, May 31----- (Launch minus 2 days) -----8 a.m. - 4:30
p.m.
Monday, June 1----- (Launch minus 1 day) -----8 a.m. - 7 p.m.
Tuesday, June 2----- (Launch) Flight day 1 -----8 a.m. - 10 p.m.
Wed.-Fri., June 3-5 ---- Flight days 2-4 -----8 a.m. - 4:30
p.m.
Saturday, June 6 ----- Flight day 5 ----- CLOSED
Sunday, June 7----- Flight day 6- (*Inflight Crew Conf.*)-12 noon - 4 p.m.
Mon.-Thurs., June 8-11--- Flight days 7-10-----8 a.m. - 4:30
p.m.
Friday, June 12----- (Landing) Flight day 11-----8 a.m. - 10 p.m.

(Times may be adjusted in real time depending on mission events and timelines.)

News media representatives may obtain STS-91 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

Saturday, May 30 ----- 10 - 11 a.m.
Sunday, May 31 ----- 8 a.m. - 12 noon
Monday, June 1 ----- 8 a.m. - 4:30 p.m.
Tuesday, June 2 ----- 8 a.m. - 5 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the query counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN. THIS IS NOT A 24-HOUR DAY OPERATION.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 1, 1998

KSC Contact: George H. Diller

KSC Release No. 65-98



SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

For the Space Shuttle, weather "outlooks" provided by the U. S. Air Force Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days in coordination with the NOAA National Weather Service Spaceflight Meteorology Group (SMG) at the Johnson Space Center in Houston. These include weather trends and their possible effects on launch day. A formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

Launch weather forecasts, ground operations forecasts, and launch weather briefings for the Mission Management Team and the Space Shuttle Launch Director are prepared by the Range Weather Operations Facility. Forecasts which apply after launch are prepared by SMG. These include all emergency landing forecasts and the end of mission forecasts briefed by SMG to the astronauts, the Flight Director and Mission Management Team.

During the countdown, formal weather briefings occur approximately as follows:

- L-24 hr 0 min: Briefing for Flight Director and astronauts
- L-21 hr 0 min: Briefing for removal of Rotating Service Structure
- L-9 hr 00 min: Briefing for external tank fuel loading
- L-4 hr 30 min: Briefing for Space Shuttle Launch Director
- L-3 hr 55 min: Briefing for astronauts
- L-2 hr 10 min: Briefing for Flight Director
- L-0 hr 35 min: Briefing for launch and RTLS
- L-0 hr 13 min: Poll all weather constraints

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

- a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.
- b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table

becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	Relative Humidity				
	(kts)	0-64%	65-74%	75-79%	80-89%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 34 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies and may be as low as 20 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.
- Launch will not occur if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch, unless the source of lightning has moved more than 10 nautical miles away from the pad or the flight path.
- The one-minute average of the electric field mill network, used to measure electric fields, shall not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad at any time within 15 minutes prior to launch.

The above rule need not apply if the following two conditions are observed to exist:

1. There are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.
2. A known source of electric fields such as ground fog, smoke or "sunrise effect" is occurring near the field mill which are conditions previously determined and documented to be benign and is clearly causing the elevated readings.

Clouds: (types known to contain hazardous electric fields)

- The Space Shuttle may not be launched if the planned flight path is through a layer of clouds with a thickness of 4,500 feet or greater where the temperature of any part of the layer is between 32 degrees F. and -4 degrees F.
- The Space Shuttle may not be launched if the planned flight path is through a cumulus type cloud with its top between the 41 degrees F. temperature level and 23 degrees F. temperature. Launch may occur if: 1) the cloud is not producing precipitation; 2) the distance from the furthest edge of the cloud top to at least one operating field mill is less than the altitude at the 23 degree F temperature level or 3 nautical miles, whichever is less; 3) field mill readings within five nautical miles of the flight path must be between -100 volts per meter and +1000 volts per meter.
- The Space Shuttle may not be launched through 1) cumulus type clouds with tops higher than the 23 degree F. temperature level; 2) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 3) through or within 10 nautical miles of the nearest edge of any cumulonimbus or thunderstorm cloud including nontransparent parts of its anvil; 4) through or within 10 nautical miles of the nearest edge of a nontransparent detached anvil cloud for the first hour after detachment from the parent thunderstorm or cumulonimbus cloud.
- The Space Shuttle may not be launched if the flight path is through any clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation within five nautical miles of the flight path.
- The Space Shuttle may not be launched if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected or observed.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				July			
Temp	Low	Avg	High	Temp	Low	Avg	High
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- Direct visual observation of the Shuttle is required through 8,000 feet. This requirement may be satisfied using optical tracking sites or a forward observer
- For cloud ceilings of any thickness between 6,000 feet and 8,000 feet the following conditions must be met for launch to occur:

a.) the vehicle integrity can be observed without interruption through 6,000 feet.

b.) all required Range Safety instrumentation is functioning properly

c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

- For cloud ceilings between 4,000 feet and 6,000 feet the following conditions must be met for launch to proceed:

a.) the thickness of the clouds must be less than 500 feet

b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8,000 feet

c.) all required Range Safety instrumentation is functioning properly

d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A "**Good Sense Rule**" is in effect for launch which states: "Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY FLIGHT RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTLS), landings at the Trans-Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). These forecasts are prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston and briefed by them to the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTLS with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required. For TAL sites, cloud coverage 4/8 or less below 5,000 feet and a visibility of 5 statute miles or greater are required.
- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability.
- For the RTLS site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- An RTLS rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:

a.) The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have

not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels within and below the clouds.

- b.)** Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading alignment circles are clear of showers.
- c.)** The movement of the showers is observed to be consistent and no additional convective development is forecast.
- d.)** Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a.) above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.
- Headwind not to exceed 25 knots.
- Tailwind not to exceed 10 knots average, 15 knots peak.
- Turbulence conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

The end of mission landing weather forecast is prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston for the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions. Decision time for the deorbit burn is 70 - 90 minutes before landing. The weather criteria are:

- Cloud coverage of 4/8 or less below 8,000 feet and a visibility of 5 miles or greater required.
- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 20 days the limit is 12 knots, day and night.
- Headwind cannot exceed 25 knots.
- Tailwind cannot exceed 10 knots average, 15 knots peak.
- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.

- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.
- Turbulence must be less than or equal to moderate intensity.
- Consideration may be given for landing with a "no go" observation and a "go" forecast if at decision time analysis clearly indicates a continuing trend of improving weather conditions, and the forecast states that all weather will be met at landing time.

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

- **Radar:** Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radar. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.
- **Field Mill Network:** Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.
- **Lightning Detection System:** Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurrence.
- **Lightning Detection And Ranging (LDAR):** Developed by NASA at the Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.
- **National Lightning Detection Network:** Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.
- **Rawinsonde:** A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.
- **Jimsphere balloon:** A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.
- **Doppler Radar Wind Profiler:** Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another Jimsphere balloon is released.
- **Rocketsonde:** A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and

370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.

- **Satellite Images and Data:** Provided directly to the satellite terminal at USAF Range Weather Operations and NOAA National Weather Service Spaceflight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.
- **Meteorological Interactive Data Display System (MIDDS):** Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.
- **Towers:** 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short-term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.
- **Buoys:** Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.
- **Solid Rocket Booster Retrieval Ships:** These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.
- **Weather Reconnaissance Aircraft:** A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

GO TO THE [KSC PRESS RELEASES](#) HOME PAGE



JOHN F. KENNEDY SPACE CENTER

May 31, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 66-98



INTERNATIONAL SPACE STATION PARTNERS ADJUST TARGET DATES FOR FIRST LAUNCHES, REVISE OTHER STATION ASSEMBLY LAUNCHES

Representatives of all nations involved in the International Space Station have agreed to officially target a November 1998 launch for the first station component and to revise launch target dates for the remainder of the 43-flight station assembly plan.

In meetings of the Space Station Control Board and the Heads-of-Agency on May 30 and 31 at the Kennedy Space Center, all station partners agreed to target launch dates of Nov. 20, 1998 for the Control Module (FGB) today named Zarya (Russian word for sunrise) and Dec. 3, 1998 for shuttle mission STS-88 with Unity (Node I). Changes in the construction schedule for the third station component, the Russian-provided Service Module, led the partners to reschedule the first assembly launches. The Service Module will house the first station occupants and the European Space Agency provided Data Management System.

Although the new dates move the launch of the first station component, Zarya, from June to November, the target dates agreed upon for many major station milestones during the latter portions of the five-year assembly plan are little changed. In addition, several enhancements to the station's assembly have been made, including an exterior "warehouse" for spare parts and a Brazilian-provided carrier for exterior station components that are launched aboard the Space Shuttle.

The International Space Station partners set an April 1999 target launch date for the Russian Service Module. The first station crew - Commander Bill Shepherd, Soyuz Commander Yuri Gidzenko and Flight Engineer Sergei Krikalev - will be launched aboard a Russian Soyuz spacecraft in summer 1999 to begin a five-month inaugural stay. Launch of the U.S. Laboratory module is set for October 1999. Launches of other laboratory modules, provided by Europe, Japan and Russia, will take place later in the assembly sequence. The Canadian-provided station robotic arm, or Space Station Remote Manipulator System, will be launched in December 1999. The scientific research will commence aboard the station early in the year 2000.

The expansion from a three-person crew to a six-person capability is planned in November 2002. And the final launch in the assembly sequence is set for January 2004, only one month later than in the previous assembly plan. Some issues in this assembly sequence remain under review and will be resolved at a Space Station Control Board meeting in September.

NASA continues the development of an Interim Control Module (ICM) as a contingency against further delays in the Service Module and as a potential additional propellant

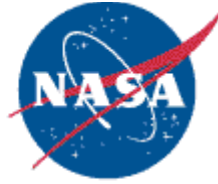
capability for a more robust space station. A decision concerning the configuration of the ICM will be made later this year.

During the Heads-of-Agency meeting, the Russian Space Agency (RSA) stated that the Russian government has made the International Space Station its number one civil space priority. RSA noted that progress on the Service Module continues to meet a launch in April 1999. RSA is also working to deorbit Mir as early as is safely possible, with a goal of developing a potential to deorbit by July 1999. The international partners expressed their concern with delays to the International Space Station program to date and brought to the attention of RSA that it is critical to all participating nations that the station program schedule is met.

The agencies' leaders also acknowledged the atmosphere of cooperation, the accomplishments and the successful achievements of the Shuttle-Mir Program (Phase I) and look forward to the smooth transition to Phases 2 and 3 of the International Space Station. In addition, they highlighted the ongoing International Space Station training currently under way for the first four station crews.

Full details of the current International Space Station Assembly Sequence, Revision D, are available in a NASA fact sheet. The fact sheet may be obtained from the internet at the International Space Station Web at <http://station.nasa.gov>.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 5, 1998

KSC Contact: Patti Phelps

KSC Release No. 67-98



NASA HONORS KENNEDY SPACE CENTER EMPLOYEES

Kennedy Space Center (KSC) honored 50 of its civil service and contractor employees at a special Honoree Event held May 31-June 2 at the space center.

The KSC employees are among some 280 NASA and industry employees from around the country who were honored by top NASA and industry leaders for their significant contributions to the nation's space program.

The KSC employees attended a special reception in their honor, and were joined by astronauts and senior NASA and industry officials of the Space Shuttle and International Space Station team. They were given a VIP tour of Kennedy Space Center and participated in various briefings. They also watched the STS-91 launch of the Space Shuttle Discovery on Tuesday, June 2, from a special VIP viewing site. STS-91 is the ninth and final planned docking of the Space Shuttle with the Russian Space Station Mir.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. Recipients are selected for their professional dedication and outstanding achievement in support of the human spaceflight program.

Eleven civil service employees were honored. They are Frederick W. Adams, Regina M. Clifton, Steven R. Davis, Rebecca M. Denis, Marie P. Dumoulin, Jack J. Fox, Patricia E. Gladney, Robert E. Monson, Dawn M. Schaible, Kendall K. Thornsley and John J. Zuber.

Boeing Florida Operations employees honored include Thomas L. Bonifacio, Sandra K. Grizzle, Kim E. Mackey and Carmen C. Moore, Boeing Space Transportation, Payload Ground Operations; Christopher E. Hill and Brian J. McGurk, Boeing Space Transportation, Reusable Space Systems; Steven G. Hoffman, Boeing Space Transportation, International Space Station; and Joseph C. Huyck, Boeing Space Transportation, Rocketdyne Propulsion & Power.

Other contractor Honorees were Suzanne K. Kepler, Dynacs Engineering Co. Inc.; Robert E. Schack, Wiltech Corp.; Mary A. Adams, United Service Associates Inc.; Vivian Adams, Kim R. Draves, Diane I. Larose, Leif K. Morton, Rodney E. Nickell, E. Keith Robinson and Karen A. Stephenson, EG&G Florida Inc.; Sally A. Herkel, Donald S. Koerlin, Randy K. Ritchie, Richard S. Brolliar and Victor Yeung, United Technologies, USBI Co.; E. Frank Rooks, Odetics Inc.; and Larry J. Sutton, Corning Inc.

United Space Alliance employees honored were Anthony Andreoni, Vicki J. Arrington, Elvis M. Biggs, Butch L. Carr, Mark S. Cascio, Michael D. Erwin, Terry M. Gaetjens, Teresa D. Grimm, Jamie S. Nehmer, Anne M. Pongracz, William C. Potteiger, Dori H.

Swift, Rondall O. Ward and Julee M. Wardman.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 24, 1998

KSC Contact: Patti Phelps

KSC Release No. 73-98

ROBERT E. MONSON HONORED FOR ROLE IN SPACE PROGRAM

Robert E. Monson, a native of New Haven, CT, and son of Mary C. Monson of North Haven, CT, and James D. Monson of Hamden, CT, was among 50 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Monson graduated in 1972 from Eli Whitney Vocational High School, Hamden, CT. He received a bachelor's degree in business from Western Illinois University in 1995. He also studied quality assurance at California State University and served in the U.S. Air Force from 1972-76.

At KSC, Monson is employed by NASA as a process analyst in the Safety and Mission Assurance Directorate. He joined the space center in 1994, and is a certified quality engineer, quality auditor and ISO 9000 auditor.

Monson lives in Palm Bay, FL, and is a member of the Veterans of Foreign Wars Post 4536 and American Legion Post 117. He has four children, Laura, Erin, Kyle and John.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 50 employees selected were part of a contingent of some 280 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior NASA and industry officials of the Space Shuttle and International Space Station team. The Honorees also were taken to a special VIP viewing area to watch the STS-91 launch of the Space Shuttle Discovery on June 2.

Kennedy Space Center is the launch site and preferred landing site for NASA's Space Shuttles. STS-91 is the ninth and final planned docking of the Space Shuttle with the Russian Space Station Mir. Crew members on the trip to Mir are Commander Charles J. Precourt, Pilot Dominic L. Pudwill Gorie, and Mission Specialists Wendy B. Lawrence, Franklin R. Chang-Diaz, Janet Lynn Kavandi and Valery Victorovitch Ryumin, a Russian cosmonaut. Mission Specialist S. W. Thomas, who has been staying on Mir since late January, will return to Earth aboard Discovery to conclude Phase I of the joint U.S.-Russian International Space Station

program.

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JOHN F. KENNEDY SPACE CENTER

June 24, 1998

KSC Contact: Patti Phelps

KSC Release No. 76-98

SUZANNE K. KEPLER HONORED FOR ROLE IN SPACE PROGRAM

Suzanne K. Kepler, a native and longtime resident of Manistee, MI, was among 50 Kennedy Space Center (KSC) employees who were honored recently for their exemplary work at the nation's spaceport.

Kepler is the daughter of the late Mr. and Mrs. Nels P. Andersen. She graduated in 1968 from Manistee (MI) High School. She also attended Brevard Community College in Brevard County, FL.

At KSC, Kepler is employed by Dynacs Engineering Co. Inc., as a lead accountant. She joined the space center in 1988.

Kepler lives in Rockledge, FL. She has three children, Tricia, Timothy and Tiffany Opalka.

The Honoree Award is the highest form of recognition bestowed upon an employee by the NASA Space Flight Awareness Program. The 50 employees selected were part of a contingent of some 280 NASA and contractor employees from throughout the space agency being honored for their professional dedication and outstanding achievement in support of the human space flight program.

The Honorees were given a VIP tour of Kennedy Space Center and attended a special reception. Honoring them were several astronauts and senior NASA and industry officials of the Space Shuttle and International Space Station team. The Honorees also were taken to a special VIP viewing area to watch the STS-91 launch of the Space Shuttle Discovery on June 2.

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JOHN F. KENNEDY SPACE CENTER

June 9, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 79-98



SONS GET BEHIND-THE-SCENES LOOK AT KSC JUNE 11

In celebration of the annual "Take Our Sons to Work Day," KSC employees have an opportunity to bring their sons to work at the space center June 11.

This day will be dedicated to the sons of civil service employees in a manner similar to the "Take Our Daughters to Work Day" held earlier this year. Sponsors will be permitted to bring their sons inside KSC's secured gates for a full day of a behind-the-scenes look at where their mother or father works.

The day will begin at 8 a.m. in the KSC Visitor Complex IMAX II Theater. KSC Deputy Director for Launch and Payload Processing Loren Shriver will open the program. Then, Carlton Hall, manager of Ecological Programs for Dynamac Corporation, will speak, followed by Joey Shuh, the first place winner of the International Science Fair and a 1998 graduate of Satellite Beach High School.

Participants then will go to their parents' work areas for the rest of the day.

Sons who are nine years of age or older are eligible to participate and will receive special badges for entrance into KSC. Although most children will be accompanied by a parent, sponsors can be another family member or KSC worker. Due to safety requirements, certain operational areas will be off-limits to visitors.

NOTE TO EDITORS: News media representatives wishing to cover the event should contact the KSC News Center to coordinate photo opportunity times.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 11, 1998



KSC Contact: Bruce Buckingham

KSC Release No. 80-98

Note to Editors:

DISCOVERY SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-91

The orbiter Discovery is scheduled to land at Kennedy Space Center on Friday, June 12 at 2 p.m. EDT completing its 10-day STS-91 mission which was launched from KSC on June 2.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 155 at mission elapsed time 9 days, 19 hours, 54 minutes. Deorbit burn will occur at about 12:52 p.m. Friday.

The two KSC landing opportunities on Friday are: 2 p.m. and 3:36 p.m. EDT. Managers have decided not to call up the back-up landing location at Edwards Air Force Base (EAFB), CA, for a landing attempt on Friday.

If managers must keep Discovery in orbit an additional day, two landing opportunities are available on Saturday at KSC and two at EAFB.

KSC Saturday landing times are: 12:54 p.m. and 2:29 p.m. EDT.

EAFB Saturday landing times are: 4 p.m. and 5:36 p.m. EDT.

This landing of Discovery will mark the 44th landing at KSC in the history of Space Shuttle flight. It will be the 15th consecutive landing at KSC and the 22nd in the last 23 shuttle flights. Discovery is currently on the 91st Space Shuttle mission in the history of the program.

Following landing, select members of the crew (except Andy Thomas) are scheduled to participate in a press conference at the KSC Press Site auditorium. The event will be carried live on NASA TV beginning at about 7 p.m. Also, a same-day taped interview of Andy Thomas from the crew quarters is scheduled to be played on NASA TV at about 10 p.m. On the day following landing, the entire crew will depart for their homes in Houston, TX. at about 5 p.m.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew

will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Discovery June 2. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC late Saturday afternoon.

If Discovery lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 7-8 hours after Discovery lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 2 for post-flight deservicing. Operations in OPF bay 2 will be made to prepare Discovery for its next Space Shuttle mission, STS-95, currently scheduled for launch in October.

-- end --

NOTICE TO EDITORS: The KSC press site will be open Friday, June 12, from 8 a.m. - 10 p.m. Media wishing to view Discovery's landing should be at the KSC press site prior to 1 p.m. for transport to the SLF. Accreditation must be arranged in advance. On the day following landing, Saturday, June 13, the office will be open from 3 - 4:30 p.m. to support the crew departure photo opportunity.

Additional specific information regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours is available at the KSC News Center. Recorded status of KSC Space Shuttle launch and landing operations can be reached by calling 407-867-2525.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 15, 1998

KSC Contact: Joel Wells

KSC Release No. 81-98



SOLID ROCKET BOOSTER RECOVERY SHIPS "PULL" DOUBLE DUTY

Freedom Star, one of two solid rocket booster recovery ships, set sail Friday from New Orleans, LA bound for Port Canaveral, FL towing in its wake a Shuttle external fuel tank barge. This first time towing arrangement is part of a cost savings plan to prudently manage existing resources.

Freedom Star and the external tank barge are expected to arrive at Port Canaveral, FL on Tuesday, June 16. The 5-day voyage began at 9 a.m. EDT June 12 from the Michoud Assembly Facility in New Orleans where the Shuttle's external tanks are manufactured. Once the barge arrives at the port, it will be transported up river and to the LC-39 turn basin using a conventional tugboat. The tank being towed this trip is the third super lightweight tank and is slated to launch with orbiter Discovery in October.

"This is an excellent example of how we can change the way we do business and make better use of our available resources," said Bob Sieck, KSC's Director of Shuttle Processing.

Previously, NASA relied on a separate contractor to provide external tank towing services at a cost of about \$120,000 per trip. The new plan allows NASA's Space Flight Operations contractor, United Space Alliance (USA) to provide the same service directly to NASA using the booster recovery ships during their downtime between Shuttle launches. "Our studies show a potential savings of about \$50,000 per trip," said USA project manager Anker Rasmussen. "The cost of needed recovery ship modifications should be paid back by the fourteenth tank delivery."

The other recovery vessel, Liberty Star, has undergone deck strengthening enhancements along with Freedom Star and will soon have the necessary towing winch installed.

NOTE TO EDITORS: Media interested in viewing the arrival of Freedom Star and the external tank barge at Port Canaveral should contact the KSC Press Site to obtain the latest estimated arrival time. Early estimates indicate the barge will arrive at the port at about 9 a.m. on Tuesday.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 17, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 82-98



FUNDING APPROVED FOR FUTURE EXPANSION OF INCUBATION CENTER

Kennedy Space Center has been allocated \$432,000 over the next two years to augment the existing Florida/NASA Business Incubation Center through the Technology Research and Development Authority (TRDA). This money is part of a \$5 million line item in NASA's 1998 budget for support of technology-based small business incubators.

TRDA is a technology-oriented economic development organization established by the State of Florida. TRDA and its partners have created a progressive organization to nurture young technology businesses in the vicinity of KSC and act as a conduit through which NASA-developed technologies can be commercialized.

The Incubation Center opened in August 1996 with the goal of increasing the number of successful technology-based small companies. By offering affordable space and shared office equipment and services, the incubator is now making it possible to reduce many costs associated with establishing and operating a business.

Support facilities and programs to train and nurture the new entrepreneurs in the establishment and operation of their companies help the new technology-based ventures have the best possible chance of success.

The current incubator facility, located in Titusville, FL, totals about 10,000 square feet and consists of shared office space, laboratory work areas, conference room and reception area.

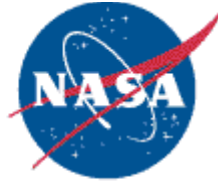
The Titusville facility was opened with two client firms. Three subsequent tenants have licensed technologies from NASA and are now developing them for the marketplace. The Center's first graduated tenant, in June 1997, was Infotech Systems, a minority-owned software developer now residing in a commercial office in Palm Bay, FL.

Under a recent grant from NASA/KSC, the Center began expanding its facilities and services to other locations in Brevard County.

Current on-site client firms have more than doubled (to nine) in the past several months. There are a total of 12 off-site clients throughout Brevard County with additional clients expected in the future. After two years, the incubator network is expected to transition to a fully self-supporting organization through private sector investment and participation.

NOTE TO EDITORS: For additional information, contact Incubation Center Director Tom G. Rainey at 407-383-5200. For additional information about NASA participation in the incubator program, contact Dan Culbertson at 407-867-6364.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 17, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 83-98



AWARDS CEREMONY RECOGNIZES OUTSTANDING KSC EMPLOYEES

The 1997 Kennedy Space Center Honor Awards Ceremony was held today at the KSC Visitor Complex as more than 200 employees were recognized for their efforts that contributed significantly to helping achieve the Center's mission. Among the honors presented were the KSC Director's Award, the Equal Opportunity Award and Medal, two Presidential Rank Awards, the Secretary of the Year Award, Outstanding Leadership Medals, and four Service Awards. Individual and group awards also recognized contributions centerwide.

"This annual ceremony is KSC's version of the Academy Awards," said KSC Director Roy Bridges. "Those honored today represent the thousands of dedicated men and women who, day in and day out, accomplish the space center's mission to benefit our community, our nation and, in fact, the entire world."

The Director's Award, the highest award the center confers upon an employee, went to Saul Barton for to his outstanding leadership and contribution during the formative and implementation stages of KSC's Implementation Plan and Strategic Roadmap. Barton's expertise, patience, persistence, and collaborative skills contributed immeasurably to the success of KSC's strategic planning efforts.

The Distinguished Service Medal was awarded to James F. Harrington III for outstanding leadership in Shuttle processing and dedication to the Space Shuttle program. This medal is awarded to any person in the federal service who, by distinguished service, ability, or courage, has personally made a contribution representing substantial progress to the NASA mission. This is the highest honor that NASA confers.

Presidential Executive Rank Awards recognize federal senior executives who have demonstrated exceptional performance over an extended period of time. The Meritorious Executive Rank awards were received by KSC Deputy Director for Launch and Payload Processing Loren J. Shriver and Deputy Director for Business Operations James L. Jennings. This award is made to the top five percent of "sustained accomplishment" performers. Criteria include career achievements acknowledged on a national or international level; achieve significant cost reduction; and demonstrate personal initiative and innovation in meeting goals and policies.

James H. Deshotel, Jimmie L. Dyer, James D. Belote, and W. Paula Williams received a 40-Year Service Award. This award is given in grateful recognition of 40 years of faithful service to NASA and the U.S. Government.

The Secretary of the Year Award is granted to a KSC secretary who has demonstrated exemplary performance characterized by a high degree of personal integrity, judgment and responsibility. Mary Joy Colston is the recipient of this award for her outstanding professionalism, dedication, and exceptional contributions to the successful operations of the KSC Procurement Office.

The KSC Equal Opportunity Award is granted for outstanding contributions to equal opportunity. John J. "Tip" Talone Jr. received this award, which is granted for encouraging self-development and training among minorities and women and assigning these employees to tasks that broaden their experience. Talone was recognized for advancing cultural diversity in the Space Station Hardware Integration Office.

The Equal Opportunity Medal is awarded for outstanding achievement and material contribution to the goals of NASA's equal opportunity programs either within the government or within community organizations or groups. J. Albert "Jay" Diggs Jr., the former Equal Opportunity Officer at KSC, was the recipient of this award.

The NASA Outstanding Leadership Medal, awarded for notably outstanding leadership which has had a pronounced effect upon the technical or administrative programs of NASA, was received by Retha P. Hart, Joel R. Reynolds, Ralph R. Roe Jr., and John J. "Tip" Talone Jr.

Other awards with numerous recipients included the Exceptional Service Medal and the Group Achievement Award (with a special mention going to the Payload and Expendable Launch Vehicle Team and the NASA KSC Mars Pathfinder Support Team.) Also with numerous recipients were the Public Service Group Achievement Award; the Public Service Medal, for exceptional contributions to the mission of NASA; the Exceptional Achievement Medal; and the Certificate of Commendation for exceptional individual accomplishments or outstanding management of a program that affects the entire center or contributes significantly to the center's mission. A KSC Award Special Mention went to Delaware North Park Services of Spaceport, Inc.-Marketing Department for seeking out opportunities to create awareness of the KSC Visitor Complex and telling the NASA story --past, present and future.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

June 26, 1998

KSC Contact: Joel Wells

KSC Release No. 84-98



KSC JOINS WITH STATE IN FIGHT AGAINST FLORIDA BRUSH FIRES

Overburdened with round-the-clock firefights, Florida's Division of Forestry this week called on Kennedy Space Center (KSC) to join the fray. Through the use of its helicopter, an infrared camera, a global positioning satellite system and operating crews since June 23, KSC has helped ground forces prioritize their firefighting and evacuation efforts.

"These fires are a community problem and as an integral part of the Florida community we want to help in any way that we can," said Marvin Jones, director of KSC's Installation Operations Office. "The state has its hands full with these brush fires and since we have the technology and resources, we're glad to pitch in."

KSC's Huey UH-1 helicopter has been outfitted with a Forward Looking Infrared Radar (FLIR) system and portable global positioning satellite (GPS) system to support these emergency activities. The FLIR includes a beach-ball sized infrared camera that is mounted on the chopper's right siderail and a real-time TV monitor and recorder installed inside. While the FLIR collects temperature data and images, the GPS system provides the exact coordinates of the fires being observed and passes the invaluable data on to the busy ground forces.

For weeks now, Florida has been plagued with brush fires resulting from extremely dry conditions and lightning storms. With thousands of acres burning simultaneously, firefighters are challenged to find out which fires are burning the hottest and which pose the greatest threat to human safety and property. "We had a problem and NASA responded quickly with a solution," said Dan Brandon, Division of Forestry planning chief. "We're working to contain this fire and KSC's tools are showing us exactly where we stand and where we need to focus our taxed resources."

KSC's security team routinely uses the FLIR equipment prior to Shuttle launch and landing activities to ensure that the area surrounding the launch pad and runway are clear of unauthorized personnel. KSC's Base Operations Contractor, EG&G Florida, operates the NASA-owned helicopter and the security team has been called on before to support missing person searches and wildlife tracking activities on the Merritt Island National Wildlife Refuge.

NOTE TO EDITORS: Video footage and still photos of the NASA helicopter, flight crew and FLIR system are available upon request from the KSC Press Site. Digital images are available at www.ksc.nasa.gov.



JOHN F. KENNEDY SPACE CENTER

July 1, 1998

KSC Contact: Joel Wells

KSC Release No. 85-98



KSC'S NEW SPACE SHUTTLE MAIN ENGINE PROCESSING FACILITY OPENS JULY 6

[photo](#)

KSC's brand new 34,600-square-foot Space Shuttle Main Engine Processing Facility (SSMEPF) officially opens for business July 6. A major addition to the existing Orbiter Processing Facility bay 3, the SSMEPF replaces the Shuttle Main Engine Shop located in the Vehicle Assembly Building (VAB).

KSC Director Roy Bridges will welcome the ceremony's attendees. He will be followed by remarks from U.S. Congressman Dave Weldon; KSC's Director of Shuttle Processing Bob Sieck; NASA's Launch Integration Manager Donald McMonagle; and Rocketdyne Vice President John Plowden.

NASA selected Ivey's Construction, Inc., Merritt Island, FL, to build the \$6.2 million facility to increase the capacity and efficiency of Shuttle main engine operations. The decision to move these operations out of the VAB was prompted by safety considerations and recent engine processing improvements. Managers sought to minimize the number of workers and activities in the VAB where final assembly of the Shuttle's solid rocket boosters and external tank occurs.

Construction of the SSMEPF began in October 1996 and was completed this past February. Efforts are currently under way to transfer the main engine pedestals, pneumatic panels, hydraulic test equipment and the engines themselves from the VAB to the SSMEPF. A 10-ton and a 15-ton crane already have been installed in the new facility.

Each of the Shuttle's three main engines generate approximately 375,000 pounds of thrust during liftoff, providing about 20 percent of the power needed to launch the spaceship into orbit. They are the only reusable liquid-fueled rocket engines in existence and undergo prelaunch preparations at KSC before installation into the orbiter in the OPF.

The first three main engines to be processed in the new facility will fly on Shuttle Endeavour's STS-88 mission in December 1998.

NOTE TO EDITORS: A ribbon cutting ceremony for the SSMEPF begins at 9:30 a.m. on Monday, July 6. Media interested in attending the ceremony should report to the KSC Press Site by 8:30 a.m. for escort to the new facility.



JOHN F. KENNEDY SPACE CENTER

July 7, 1998

KSC Contact: Lisa Malone

KSC Release No. 86-98



GORMEL TO HEAD JOINT BASE OPERATIONS OFFICE; OTHER KEY PERSONNEL ASSIGNED

KSC Director Roy Bridges announced the selection of Ed Gormel as the executive director of the newly formed Joint Performance Management Office (JPMO). In this position he will manage the Joint Base Operations and Support Contract (J-BOSC) to be awarded later this year. Bridges also made several other executive personnel assignments to reflect new KSC roles.

"By combining resources and jointly managing base operations activities for NASA Kennedy Space Center and the United States Air Force, 45th Space Wing, we will reduce costs and improve services for all customers," said Bridges. "The J-BOSC is a bold initiative which will greatly improve the competitiveness of our eastern national spaceport."

As the joint program manager for both KSC and the 45th Space Wing at Cape Canaveral Air Station and Patrick Air Force Base, Gormel will direct the support of a safe, efficient and effective environment providing premier base support for the space launch community. He is responsible for contract management and administration of the J-BOSC. Gormel will report to the chair of the J-BOSC board of directors and is administratively accountable to the KSC director. The positions of chair and vice chair of the J-BOSC board rotate between the KSC director and the 45th Space Wing commander.

Gormel, a 30-year veteran of the Air Force's Eastern Test Range, has held various roles of leadership including chief of Range Scheduling, test supervisor of the Navy's Trident Program and director of Plans for the 45th Space Wing. He is credited with hundreds of innovations at Patrick Air Force Base and Cape Canaveral Air Station. Most recently, Gormel has served as co-chair of the J-BOSC Source Evaluation Board where he has shaped key aspects of the initiative.

Over the next few months, the JPMO Office will be staffed with NASA and Air Force civil service and active duty military personnel.

Other KSC personnel assignments

Bridges also announced several executive personnel assignments at KSC to reflect the center's new leadership role in the Expendable Launch Vehicle program, to make the best possible use of the center's leadership corps to guide the center toward KSC's Roadmap objectives and to fill gaps left due to recent retirements.

The Payload Processing Directorate is being reorganized into two distinct organizations.

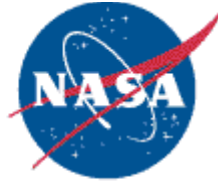
Bobby Bruckner, former Payload Processing director, is assigned as director of the Expendable Launch Vehicle (ELV) and Payload Carriers Program Office. Larry Ellis, former director of Shuttle Processing Integration, is the new director of ELV Launch Services reporting to Bruckner. Sterling Smith, currently acting director of the Payload Carriers Program Office, will continue to serve in that capacity reporting to Bruckner and assisting with the merger of the two programs until his retirement later this year. Steve Francois is named director of the Space Station and Shuttle Payloads Directorate with Shannon Bartell serving as his deputy.

J. Chris Fairey, former director of Quality Assurance, becomes the director of Shuttle Processing Integration, succeeding Ellis. Ann Montgomery, former deputy director of Logistics Operations, moves to the Quality Assurance director role, succeeding Fairey.

-- end --

Editors Note: Biographies of individuals mentioned above are available on the KSC home page at www-pao.ksc.nasa.gov/kscpao/bios/bios.htm

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

July 14, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 87-98



KSC HOLDS FIRST SUPER SAFETY DAY JULY 16

For the first time ever, KSC employees are suspending normal operations and rescheduling Shuttle and space station work for a full day in order to focus exclusively on safety. On July 16, 1998, about 14,000 KSC employees, NASA civil service and contractors, will depart from their normal activities to participate in a panel discussion that will be broadcast center-wide and to visit dozens of safety related displays.

The Super Safety Day theme is "Safety On The Line," meaning all workers are on the line every day to practice safety in their work and personal lives. Other activities on this day include an interactive employee question and answer session with the safety day panel, vendor displays, and organizational seminars and training.

Also participating in the safety day activities are employees from Cape Canaveral Air Station and Patrick Air Force Base.

Super Safety Day represents the commitment of KSC Director Roy Bridges to the center's paramount guiding principle of safety and health first. "The purpose is to encourage all employees to practice good safety behavior everyday," Bridges said, "on and off the job."

Focusing on safety for a full day will allow employees to concentrate on safety issues and to understand how they can work safer. It is a day to inform and to educate workers on new safety concepts and safety training.

"Devoting the entire day to safety is a clear message from Mr. Bridges," said Al Sofge, associate director of Safety and Mission Assurance at KSC. "It is another example of his commitment to the safety of the employees at the center. Everyone at the center will use this day to rededicate themselves to a safer tomorrow at work, home or driving."

The day's activities will begin at 8 a.m. with a welcome from Bridges and a keynote address by C. Gordon Fullerton, NASA pilot and astronaut, to civil service employees, contractors and military personnel. Brief presentations will follow by a panel including Air Force Brig. Gen. Randall Starbuck, commander, 45th Space Wing and director, Eastern Range, Patrick Air Force Base; Kenneth Cockrell, chief, Astronaut Office; Tommy Holloway, manager, NASA's Space Shuttle Program Office; Richard Blomberg, chairman, Aerospace Safety Advisory Panel; and JoAnn Morgan, associate director for Advanced Development and Shuttle Upgrades.

They will then be joined by additional panel members including: Ed Adamek, associate program manager, Ground Operations, United Space Alliance; Thomas Breakfield, director, Safety and Mission Assurance; Irene Long, M.D., director, Biomedical Office;

Stephen Francois, director, Space Station and Shuttle Payloads; Richard Jolley, president and general manager, EG&G Florida, Inc.; Marvin Jones, director, Installation Operations; Bruce Melnick, program manager, Boeing, Payload Ground Operations Contract; Kenneth Payne, director of Logistics Operations; Bob Sieck, director, Shuttle Processing; and Roy Tharpe, manager, Launch Site Management Office, Boeing, Information Space and Defense Systems.

The three-hour session will be broadcast live on closed circuit television for all KSC, CCAS and PAFB employees to view. All viewers will be encouraged to submit questions during the panel discussion via telephone, fax or e-mail.

"The panel represents all major areas and all personnel at the center," said Sofge. "Anyone working at the center has the ability to ask top managers in those various areas safety-related questions."

Following the morning questions and answer session, employees will view about 100 safety displays set up around KSC, CCAS and PAFB. Among the vendors setting up exhibits are Johnson & Johnson, National Safety Council, KSC Fire Department, Florida Power and Light, American Airlines, American Red Cross, Health First-Cape Canaveral Hospital, and Iron Age Safety Shoes.

For the afternoon of Super Safety Day, individual organizations are tailoring safety awareness programs to their specific functions.

NOTE TO EDITORS: News media are invited to watch the morning panel briefing and the employee question and answer session from televisions at the KSC Press Site. Escorts will be provided in the afternoon to take interested media to the various vendor locations and exhibition sites.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

July 10, 1998

KSC Contact: Joel Wells

KSC Release No. 88-98



KSC REACHES OUT IN THE HEAT OF FLORIDA BRUSHFIRES

Whether struggling alongside the army of firefighters on the frontlines or donating food and refreshments, NASA's Kennedy Space Center has aggressively responded to a myriad of needs across the flame-scorched state of Florida.

Brush fires began raging through Volusia and Flagler counties in May destroying thousands of acres and threatening lives. KSC officials immediately began mobilizing their resources with plans to help their northern neighbors. Then the blazes flared up in North Brevard - closer to home.

"It looked like a tidal wave of flames headed straight for my home," recalled Mike Mulcahy, Fawn Lake resident and KSC employee. "There were about 10 ground crews and a couple of helicopters working to save our subdivision in Mims when KSC's water cannon truck showed up. The ground crews told me that my home would have been lost if KSC didn't come in and knock down the fire that threatened my house."

After working to contain a 4,000 acre KSC brush fire started by lightning on June 21, KSC's Fire Department chipped in equipment and personnel to help fight other central Florida fires. While some monitored the brush still smoldering around the space center's facilities, about 33 percent of KSC's fire fighting resources have been committed to an outbreak of wildfires in Brevard since June 27. A KSC fire engine and two aircraft rescue trucks were also allocated to the effort. Base Operations Contractor, EG&G Florida, Inc. provides KSC's emergency and security services.

"The leadership and courage our firefighters displayed helped in saving about 50 structures in North Brevard, including homes, businesses and the recently built Mims Post Office," reported Tim Moore, KSC Fire Chief. "KSC fire officers were appointed as task force leaders in Mims and Scottsmoor and their tactics rewrote the rules on fighting brush fires that involve structures."

With heavy air traffic and refueling operations bustling at Titusville's Space Coast Executive Airport (SCEA), one KSC rescue truck was needed to support aircraft performing water drops over fire afflicted areas. Five KSC sludge tankers were also staged at SCEA to mix the flame retardant needed for additional strategic air strikes. Also provided was NASA's rail car tanker loaded with 20,000 gallons of water. KSC workers had to fabricate a special elbow connection to the tanker enabling it to fill empty fire trucks waiting in North Brevard where no municipal water source is available.

NASA security and aircraft crews teamed up beginning June 23 to identify dozens of

"hotspots" posing serious threat to human safety and property in Volusia and Flagler counties. Florida's Division of Forestry called on KSC helicopters and their onboard Forward Looking Infrared Radar system to help in prioritizing their fire fighting and evacuation efforts. KSC security also provided traffic control support during the Brevard county road closures.

The KSC Community Relations Council, comprised of NASA civil servants and prime contractor representatives from EG&G Florida, Delaware North, The Boeing Company, United Space Alliance and USBI, mobilized KSC employees to donate refreshment supplies to weary firefighters from across the nation. About 2,500 pounds of snack foods, sport drinks, water and Styrofoam coolers were transported to the Salvation Army for delivery to the front lines. "As Central Florida residents we can't physically fight these fires, so we have to support those who can. This is just our simple 'thank you' to the firefighters," explained Celene Morgan, who coordinated the council's fire relief efforts. Also, employees from KSC contractors Boeing and United Space Alliance independently donated thousands of dollars to Brevard and Volusia county fire relief funds.

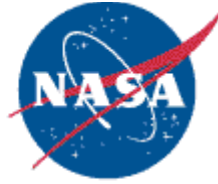
"We've just been exercising our good neighbor policy," said KSC Director, Roy Bridges. "I'm sincerely proud of the center-wide contributions from our fire department, security office, aircraft operations and the many other KSC employees."

KSC and Eastern Range weather officials also assisted state fire analysts with wind, temperature and lightning data updates. Analysts were given access to crucial information collected from a network of 41 wind towers extending from KSC to west of Interstate-95; KSC's unique Lightning Detection and Ranging system data; and infrared satellite and weather radar data. The existing space related weather infrastructure continues to provide insight to those studying wildfire progression.

So far, more than 10 internal KSC organizations have supported fire fighting or relief efforts in the Central Florida area amassing greater than 1,392 man hours of service to date.

NOTE TO EDITORS: Video footage and still photos of KSC resources such as helicopters, fire trucks, and associated crews in action are available upon request from the KSC Press Site. Footage of interviews with various crew members are also available. Digital images are available at www.ksc.nasa.gov under publisher's photo corner.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

August 7, 1998

KSC Contact: Joel Wells

KSC Release No. 90-98



KSC ACHIEVES ISO CERTIFICATION FOR ALL ORGANIZATIONS

Without exception, every NASA organization at John F. Kennedy Space Center has met the requirements for ISO 9001 certification. As NASA's center of excellence for launch and payload processing systems, KSC will use this certification as a tool to improve an already world-class team.

[Det Norske Veritas \(DNV\), Inc.](#), an international ISO certification organization, will present their 2,000th certificate of ISO registration to KSC on Aug. 11 at 9 a.m. KSC Director Roy Bridges will accept the certificate in a special ceremony at KSC's Training Auditorium. Congressman Dave Weldon will also address the audience.

The presentation follows a successful independent audit by DNV of the KSC Management System in May of this year. The third-party auditors examined about 20 elements of KSC's system, including management responsibility, design control, documentation, test and inspection, and corrective action procedures. DNV found that KSC met or exceeded the stringent quality standards in all areas.

"This achievement validates the excellence of KSC's management system," said Roy Bridges, KSC Director. "As we enter the new millennium focusing more on research and development responsibilities, ISO certification is the baseline for restructuring our management system."

ISO 9001 comprises the most detailed, comprehensive set of standard requirements for quality programs established by the International Standards Organization. To date, nearly 20,000 U.S. organizations have received ISO 9001 certification. All NASA centers are required by NASA Administrator Daniel S. Goldin to be ISO 9001 registered by September 1999. NASA is the first federal agency to seek the quality certification.

KSC's certification applies to management of space systems, test and launch techniques, development of associated technologies, and enhancement of core capabilities.

NOTE TO EDITORS: News media interested in attending the ISO Certification Ceremony must report to the KSC Press Site by 8 a.m. Aug. 11. Those planning to attend should call the Press Site by 4:30 p.m. Friday, Aug. 7.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

August 17, 1998

KSC Contact: George H. Diller

KSC Release No. 92-98



DEEP SPACE 1 ARRIVES AT KSC FOR LAUNCH PREPARATIONS

NASA's Deep Space 1 spacecraft, designed to validate 12 new technologies for scientific space missions of the next century, has arrived at the Kennedy Space Center to begin prelaunch processing. Deep Space 1 will be launched aboard Boeing's Delta 7326 rocket currently targeted to lift off Oct. 15, 1998. This is the first flight in NASA's New Millennium Program.

Among the experiments aboard Deep Space 1 is an ion propulsion engine strikingly similar to those described in futuristic science fiction works, and software that tracks celestial bodies so that the spacecraft can make its own navigation decisions without the intervention of ground controllers.

At launch, the diminutive Deep Space 1 weighs only 1,080 pounds fully fueled and is just 8.2 feet high, 6.9 feet deep and 5.6 feet wide, including such attached items as twin stowed solar arrays. However, when those arrays are deployed, the width will grow to 38.6 feet across. Deep Space 1 should complete most of its mission objectives during the first two months after launch. However, it will continue validating these instruments while doing a flyby of a near-Earth asteroid named 1992 KD in July 1999.

The spacecraft is being processed in NASA's Payload Hazardous Servicing Facility (PHSF) located in the KSC Industrial Area. Among the processing activities to be performed are the attachment to the spacecraft bus of the Plasma Experiment for Planetary Exploration (PEPE) instrument and the attachment of the solar arrays, each of which is among the dozen new technologies being tested on Deep Space 1.

There is to be a functional test of the advanced technology science instruments as well as of the basic spacecraft subsystems. Checks of Deep Space 1's communications system will be performed including a verification of the spacecraft's ability to send data to the Jet Propulsion Laboratory via the tracking stations of the Deep Space Network. Also, the last of the thermal blankets will be installed.

Finally, before the spacecraft leaves the Payload Hazardous Servicing Facility, it will be fueled with its hydrazine attitude control propellant. Then, on Sept. 22, it is to be transported to a spin test facility on Cape Canaveral Air Station. There it will be mated to a Star 37 solid propellant upper stage, and the combined elements will undergo a series of spin balance tests.

Meanwhile, at Complex 17, the Delta II rocket will be undergoing erection and prelaunch checkout by Boeing. The first stage is scheduled to be installed into the launcher on Sept.

10. Three solid rocket boosters will be attached around the base of the first stage the next day. The second stage will be mated atop the first stage on Sept. 15, and the dual-sector spacecraft fairing will be hoisted into the cleanroom of the pad's mobile service tower the following day.

Deep Space 1 will be transported to Complex 17 on Oct. 5 for hoisting aboard the Delta rocket on Pad A and mating to the second stage. After the spacecraft undergoes state of health checks, the fairing can be placed around it three days later. Launch, currently targeted for Thursday, Oct. 15 is at 8:42:44 a.m. EDT. The launch period ends Nov. 10.

If the spacecraft is healthy when the primary mission is completed on Sept. 18, 1999, NASA could choose to continue the spacecraft's voyage. Deep Space 1 may then be on a trajectory resulting in the flyby in January 2001 of the dormant comet Wilson-Harrington that is in the process of changing from a comet to an asteroid. Finally, in September 2001, as the spacecraft continues on this trajectory, it may also do a flyby of an active comet, Borrelly.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

August 17, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 93-98



KSC's VEHICLE ASSEMBLY BUILDING GETS NEW PAINT JOB

KSC's most visible landmark, the giant Vehicle Assembly Building (VAB), is getting a make-over. This month, EG&G Florida painters began repainting the VAB's 209-foot long American flag and replacing the 22-year old bicentennial symbol with the NASA logo, affectionately known as the "meatball."

The daunting task of scaling the 525-foot tall VAB and working from six, two-person platforms will continue through mid-September. Beginning from the top of the building and continuing to a point about 285 feet above the ground, about half of the south-side of the facility will be repainted at this time.

About 550 gallons of red, white, and blue paint will be used to cover the entire 73,000-square foot area to be painted. Delaware North Park Services, which operates the KSC Visitors Complex under a concession agreement with NASA, arranged for the Devflex 4208 waterborne acrylic gloss enamel paint to be donated by Devoe Coatings, a member of the ICI Paints World Group, Louisville, KY.

The flag and the bicentennial logo were first painted on the VAB in 1976 in celebration of America's 200th birthday. This is the first repainting of the flag.

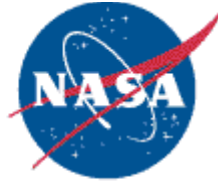
The flag is 209 feet long and 110 feet wide, covering 23,437 square feet on the upper-left side of the VAB. Each of the flag's stripes is 9 feet wide. Each star is 6 feet in diameter.

The NASA logo will be painted on the upper-right side of the VAB and will cover about 12,300 square feet, about the same size as the bicentennial emblem.

All of the paint will be applied by hand using rollers and brushes. Spray painting is prohibited due to possible over-spray damage to vehicles and equipment.

The VAB was originally built in the 1960s and used for the vertical assembly of the Saturn vehicles used in the Apollo and Skylab programs. It has since been modified to accommodate the assembly of the Space Shuttle. It covers a ground area of about 8 acres and has a volume of nearly 130 million cubic feet. It is 525 feet tall, 716 feet long, and 518 feet wide.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

August 19, 1998

KSC Contact: Joel Wells

KSC Release No. 94-98



PRACTICE MAKES PERFECT FOR KSC LAUNCH TEAM

On Aug. 20, about 150 Kennedy Space Center launch team members responsible for issuing Shuttle launch commands will eagerly staff their control room consoles unaware of the devilish dilemmas that they will face. And that's exactly how the KSC Simulation Team (Sim Team) wants it to be.

KSC's launch pads have been quiet since the last Space Shuttle launch in June, but the Launch Control Center's control rooms have maintained a steady rumble of progress during a break in this year's launch schedule. Relying on tests and simulations to keep a sharp edge, the team will be ready for Shuttle Discovery's liftoff targeted for Oct. 29.

"The best teacher for our team is the experience of a real launch countdown," explained KSC's Deputy Director of Shuttle Processing, Dave King. "We normally launch every 6 to 8 weeks, but when summer brought a five-month pause between launches, we went to work developing a practice schedule that would keep the team fresh."

Control room engineers must be certified to perform their jobs and are required to participate in a battery of standard prelaunch tests before every launch. Managers are taking advantage of the available time this summer to augment the standard year-round training. Between June 2 and Oct. 29, the team will have conducted three external fuel tank loading simulations, a simulated loading of hypergolic propellant into the orbiter maneuvering system and reaction control system, and two integrated launch countdown simulations.

Integrated simulations are a major event in the processing activity supporting the mission and require considerable preparation. The control room, normally used for daily test operations, is set up with software used to simulate flight and ground systems in the launch configuration. Engineers and test operations personnel are removed from daily tasks and assigned to their respective launch count responsibilities.

These practice sessions can zero in on a specific Shuttle subsystem and its support engineers, or in the case of this Thursday's integrated simulation, pull the entire firing room staff together for a complete Shuttle system dry run. The test begins with a call-to-stations at 8 a.m. Then a staged countdown starts at the T-20 minute mark and continues until the "launch" is aborted at about 11:30 a.m.

A crafty group of so-called gremlins conjures up glitches and troubles for the launch team to solve during the simulation. "It's our job to stress the team and prepare them to be ready for the worst-case scenario," said Paul Krause, Sim Team member and United Space

Alliance (USA) avionics manager.

"We throw 12 - 14 major problems at them between T-20 minutes and T-0, and you only see one or two during a real countdown, if any." Added Krause, "If everything that we threw at them really happened it would be a bad, bad day."

The Sim Team consists of KSC engineers that have other full-time responsibilities, but take their part-time "gremlin" duties very seriously. Debbie Frostrom, NASA test director helped set up and plan this summer's test schedule and has experienced the stress at the NTD console first hand. "The test plan and problem scenarios are kept secret from the players in the simulation," she said. "It never ceases to amaze me when they find something new to stretch the team. These guys know the Shuttle system inside and out and their scenarios make you think at extraordinary depth."

A software model plugged into KSC's launch processing system mimics the Shuttle's many components and systems. The Sim Team introduces a wide range of bogus bugs into the software system--from false sensor indications and system failures to operational weather violations. Console engineers must identify the problems, prioritize them, and respond accordingly. Adding to the realism, the software replies to their commands, and participants observe video footage of prelaunch milestones occurring on their console monitors.

As the drama unfolds, the Sim Team monitors the progress of the test from the control room next door. The launch team's communication network becomes an actor's stage, as console engineers hear over their headsets the voices of Shuttle crew members and Houston mission controllers portrayed by the Sim Team members.

When the test is over and the participants pass the "gremlins" in the hall, they may not even recognize them as the source of their stress. "If they know us, I think they pretty much respect us because they don't want to get on our bad side," jokes Bob Holl, Sim Team and USA test project engineer. "I believe they really do appreciate the job we do. KSC managers really support us because we reap real benefits from this."

According to Frostrom, "It's smart to take advantage of these testing opportunities. They not only prepare the primary launch team, but also deepen our resources by training up-and-coming engineers."

NOTE TO EDITORS: Video footage and still photos taken from the control room during the simulation will be available at the Press Site on Thursday afternoon. Video interviews with the launch director and Sim Team members will also be available. Digital images are available at www.ksc.nasa.gov

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

August 21, 1998

KSC Contact: Lisa Malone

KSC Release No. 95-98



SGS AWARDED NASA AND AIR FORCE JOINT BASE CONTRACT

NASA's Kennedy Space Center, FL, Director Roy Bridges today announced Space Gateway Support (SGS) of Herndon, VA, has been selected for award of a government contract to perform base operations for Kennedy and the 45th Space Wing, which includes Cape Canaveral Air Station and Patrick Air Force Base. SGS is a joint venture of Northrop Grumman Technical Services, Herndon, VA; ICF Kaiser Defense Programs, Inc., Fairfax, VA; and Wackenhut Services, Inc., Palm Beach Gardens, FL.

In an unprecedented display of cooperation, two government agencies will combine resources and requirements to cut expenses, reinvest savings and consolidate functions with the objective of remaining competitive in a global launch market.

"Under this single-contract acquisition approach for base support operations, we will have a great potential to increase savings and enhance customer support and performance," said Bridges. "This new acquisition approach will save the government a substantial sum over the 10 years of the contract if all options are exercised."

The cost-plus award fee contract features a five-year basic performance period, beginning Oct. 1, 1998, and an option for a five-year extension. The potential value of the contract, called the Joint Base Operations Support Contract (J-BOSC), exceeds \$2 billion over 10 years. SGS will perform work that is being performed by Kennedy's Base Operations contractor, EG&G Florida, and the 45th Space Wing's Launch Base Support contractor, Johnson Controls, and 16 other individual base-support contracts.

Other primary J-BOSC customers are government contractors for NASA and Air Force space flight operations, payload ground operations, life sciences, expendable vehicles, launch operations and support, and elements of the Navy and the Department of the Interior. J-BOSC also will serve commercial customers such as The Boeing Company, Lockheed-Martin, Orbital Sciences Corp., Astrotech (SPACEHAB) and Spaceport Florida Authority.

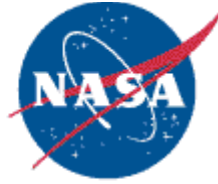
Types of work covered under the J-BOSC are: project management; public works including engineering services and infrastructure; base support services such as protective services, fire protection, logistics, information technology, administrative, medical and environmental services; and installation improvement.

The Joint Performance Management Office, a new organization staffed with a mixture of NASA and Air Force employees, will manage the J-BOSC contract. The Executive Director of the office will report to a Board of Directors. The board's chair and vice chair

will rotate every two years between the Kennedy director and 45th Space Wing commander.

"The management approach for this contract is significantly improved over what we currently do," Bridges said. "We have a very lean insight concept which emphasizes the performance-based nature of the contract."

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 4, 1998

KSC Contact: Patti Phelps

KSC Release No. 96-98



KSC WORKER HONORED BY NASA ASTRONAUTS

NASA/KSC employee Roland Schlierf of Cocoa Beach recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Astronaut Heidemarie Stefanyshyn-Piper presented the award to Schlierf on Aug. 27 at KSC.

Schlierf is a project engineer with NASA's Payload Processing Directorate. He was recognized for his significant contributions to the development of a requirements system to accommodate International Space Station payload support and technical requirements. "Through your use of the Payload Data Library and associated Payload Developer Interface, customers will achieve significant cost and time savings during technical and support requirements development," Stefanyshyn-Piper told him.

Snoopy, of the comic strip "Peanuts," has been the unofficial mascot of NASA's astronaut corps since the earliest days of human space flight. The Silver Snoopy Award was created by the astronauts to honor persons who contribute most to the safety and success of human space flight.

The award is presented to no more than 1 percent of the space center's work force each year. Recipients are given a silver pin depicting the famous beagle wearing a space suit. All the pins have flown on a previous Space Shuttle mission. The awardees also receive a framed certificate and a congratulatory letter signed by the presenting astronaut.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 4, 1998

KSC Contact: Patti Phelps

KSC Release No. 97-98



ROLAND SCHLIERF HONORED BY NASA ASTRONAUTS

Roland Schlierf, son of Mr. and Mrs. Konrad Schlierf of Venice, FL, and a 1982 graduate of Cardinal Mooney High School in Sarasota, FL, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Born in New York City, N.Y., Schlierf received a bachelor of science degree in electrical engineering in 1986 from Florida Tech in Melbourne, FL.

He and his wife, the former Liz Cluen, live in Cocoa Beach, FL. They have two children. He has been a youth minister at Our Savior Catholic Church in Cocoa Beach since 1988.

Astronaut Heidemarie Stefanyshyn-Piper presented the award to Schlierf on Aug. 27 at KSC.

Schlierf is a project engineer with NASA's Payload Processing Directorate. He was recognized for his significant contributions to the development of a requirements system to accommodate International Space Station payload support and technical requirements.

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Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

January 5, 1998

KSC Contact: George Diller

Release No. 98-2



LUNAR PROSPECTOR LAUNCH POSTPONED

The planned 8:31 p.m. launch of NASA's Lunar Prospector aboard a Lockheed Martin Athena II rocket has been postponed due to a problem with a range safety radar located at Patrick Air Force Base, FL.

The launch has been tentatively rescheduled for 9:28 p.m. EST (6:28 p.m. PST) Tuesday, Jan. 6, pending the results of a launch assessment meeting Tuesday morning. The launch window extends for four minutes.

The weather forecast for Tuesday projects a 30 percent chance of violating launch constraints due to the possible proximity of rainshowers and a slight increase in the wind.

Lunar Prospector, the third flight in NASA's Discovery Program of low-cost, highly focused planetary science missions, is designed to provide a precise global map of the Moon's surface element composition and its gravity and magnetic fields.

NOTE TO EDITORS: Badged media planning to cover the launch should meet at Gate 1 of Cape Canaveral Air Station at 8 p.m. for bus transport to the press site at 8:15 p.m.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 4, 1998

KSC Contact: Patti Phelps

KSC Release No. 98-98



ROLAND SCHLIERF HONORED BY NASA ASTRONAUTS

Roland Schlierf, a 1986 graduate of Florida Tech in Melbourne, recently was presented with NASA's prestigious Silver Snoopy Award for service to the Space Shuttle astronauts.

Born in New York City, N.Y., Schlierf received a bachelor of science degree in electrical engineering from Florida Tech, where he served as president of the Newman Club in 1986. His parents, Mr. and Mrs. Konrad Schlierf, live in Venice, FL.

He and his wife, the former Liz Cluen, live in Cocoa Beach. They have two children. He has been a youth minister at Our Savior Catholic Church in Cocoa Beach since 1988.

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Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

July 27, 1998

KSC Contact: Bruce Buckingham

Release No. 98-134



GUIDELINES FOR MEDIA COVERAGE OF STS-95

As the launch of Discovery on the STS-95 mission approaches, news media planning to cover the flight are encouraged to make logistical arrangements as early as possible. Heavy media interest in the mission will challenge the resources of NASA's Kennedy Space Center in Florida and Johnson Space Center in Houston.

Each center will have a limited amount of working space and phone and power capability available to accredited media, which may result in some restrictions on the number of media representatives who can be supported. To assist in NASA's premission planning, media intending to cover the mission should request accreditation and logistical support **no later than close of business Aug. 14, 1998.**

The following contact information is provided to guide media through the accreditation process.

Accreditation Requests:

Requests for accreditation for launch at the **Kennedy Space Center**, FL, should be faxed to the Kennedy newsroom at **407/867-2692**, attention: **Selina Scolah**.

Requests should include the names of the media representatives attending, social security or passport number, and date of birth, and must be on official letterhead of the sponsoring organization. Badges issued by Kennedy for launch will be honored for mission coverage at the Johnson Space Center and a separate request does not have to be sent to Johnson.

Media planning to cover the mission from **Johnson**, without first being accredited by Kennedy, should submit a faxed accreditation request to the Johnson newsroom at **281/483-2000**, attention: **Laura Rochon**. Requests should include the names of the media representatives attending, social security or passport number, and date of birth, and must be on official letterhead of the sponsoring organization.

Audiovisual and Television Logistics: For assistance in requesting documentation of crew training, or other audio and video products, as well as making arrangements for television or audio support for coverage of the mission, media should contact:

Kennedy: **Bill Johnson** at the press site at **407/867-2468** or **7819**.

Johnson: **Carlos Fontanot**, through the newsroom at **281/483-5111**.

Telephones and Workspace: Workspace and telephone and electrical connections may be limited. For logistical support contact:

Kennedy: Lisa Fowler at the press site at **407/867-2468**. Workspace reservations as well as guidelines and instructions for obtaining and activating phone lines will be provided to accredited media, but media must contact BellSouth directly to install and activate the phone lines.

Johnson: Laura Rochon, through the newsroom at **281/483-5111**. Workspace reservations as well as guidelines and instructions for obtaining and activating phone lines will be provided to accredited media, but media must contact Southwestern Bell directly to install and activate the phone lines.

Mission Information and Inquiries: For general information on mission coverage and background information on the crew and mission objectives, contact the NASA newsrooms at the numbers listed above. An advance look at the STS-95 mission is available on the internet at URL: <http://shuttle.nasa.gov>.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

August 3, 1998

KSC Contact: George H. Diller

Release No. 98-142



"LEONARDO" ARRIVES AT NASA'S KENNEDY SPACE CENTER

"Leonardo," one of three Italian Space Agency multi-purpose logistics modules that will be used to resupply the International Space Station, arrived last weekend at NASA's Kennedy Space Center, FL, on a special "Beluga" air cargo plane from the Alenia Aerospazio factory in Turin, Italy.

Scheduled to launch aboard Space Shuttle Endeavour (STS-100) in December 1999, "Leonardo" is a reusable logistics carrier that will be the primary delivery system to resupply and return station cargo requiring a pressurized environment. The cylindrical module is approximately 21 feet long and 15 feet in diameter, weighing almost 4.5 tons, excluding up to 20,000 pounds of contents.

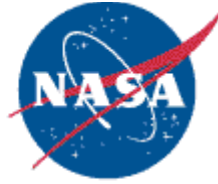
The module will contain supplies, science experiments, spare parts and components for the International Space Station. Once Endeavour is in orbit, the module will be removed from the payload bay and docked to the space station using the remote manipulator arm of either the orbiter or the station. During each multi-purpose logistics module mission, supplies and scientific experiments will be exchanged for items to be returned to Earth, including completed experiments, equipment for repair, or trash and recyclables.

"Leonardo" is being processed at Kennedy's Space Station Processing Facility with engineering support from the Italian Space Agency, Alenia Aerospazio and Boeing. Among the activities necessary for the payload test team to prepare the module for launch are integrated electrical tests with other station elements in the facility, leak tests, electrical and software compatibility tests with the Space Shuttle using the Cargo Integrated Test Equipment, and an Interface Verification Test once the module is installed in the Space Shuttle's payload bay at the launch pad. NASA's Marshall Space Flight Center, Huntsville, AL, provided the module's hardware development engineering oversight.

The most significant mechanical task to be performed on "Leonardo" in Kennedy's facility is the installation and outfitting of the racks for carrying the various experiments and cargo. The module will provide interfaces for up to 16 racks, five of which also furnish power, data and fluid support to a refrigerator freezer. The racks will be installed into the module using an efficient piece of robotic equipment called the "Rack Insertion Device." This device was developed by Kennedy engineers for fast and easy installation and removal of the racks for rapid turnaround of the logistics module between missions.

"Leonardo" is the first of three modules to be furnished to the International Space Station program by the Italian Space Agency. "Raffaello" is scheduled to arrive at Kennedy next year and "Donatello" in 2001.

Go to the [*KSC Press Releases*](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 9, 1998

KSC Contact: Joel Wells

KSC Release No. 99-98



DISCOVERY TO MOVE FROM OPF TO VAB SPORTING A NEW LOOK

After spending three months in KSC's Orbiter Processing Facility (OPF) bay 2 undergoing prelaunch preparations for Shuttle mission STS-95, Discovery is ready to be mated to the external fuel tank atop mobile launch platform No. 2 in the Vehicle Assembly Building (VAB). During Discovery's transfer from the OPF to the VAB, onlookers will preview the first orbiter in the fleet slated to launch with the NASA insignia depicted on its left wing and sidewalls.

Orbiter Discovery returned to Earth June 12 following a 10-day STS-91 mission to and from Russia's Mir Space Station. Using about 65 work days, KSC technicians conducted nose-to-tail post-flight inspections and performed a myriad of scheduled maintenance tasks on the space vehicle. Discovery is expected to begin the transfer from the OPF to the VAB at approximately 9 a.m. on Sept. 14.

During the STS-95 processing flow, an upgraded onboard communication system and a KSC designed integrated vehicle health monitoring (IVHM) system were installed on the orbiter. The Space-to-Space Orbiter Radio (SSOR) system will be tested on the upcoming flight for use during the International Space Station (ISS) construction process. It will provide direct communication between the Shuttle crew, space walking astronauts and ISS crew members without relying on ground stations for transmission.

The IVHM system is a network of sensors and instrumentation that have been installed throughout the orbiter's power reactant storage and distribution system in the midbody and in the aft compartment's main propulsion system. The upcoming flight will test IVHM's ability to monitor and process in flight data and provide ground and mission controllers with real-time snapshots of Discovery's health. Managers expect the timely information to assist in reducing future ground processing time.

In addition to Shuttle processing activities, three spherical NASA insignias were hand painted on the orbiter. The insignia on the left-hand wing measures 6 feet in diameter and the insignias on the left and right side mid-fuselage are 28 inches in diameter. The emblem, affectionately known as the "meatball," was created by James Modarelli, a former NASA Lewis Research Center employee.

"I chose the main elements of the seal - the sphere, representing a planet; stars, representing space; the wing, representing aeronautics; and an orbiting spacecraft," said Modarelli.

It took three KSC technicians four weeks to complete Discovery's aesthetic makeover. To

remain consistent with NASA's insignia update, workers removed the old NASA "worm" emblems and used 7 pints of base compound paint to stencil the new insignia in their place. The red, blue and black pigmented compound is made to withstand the extreme temperatures experienced in space flight. The other three orbiters in the fleet are undergoing the same modifications.

Once in the VAB, the orbiter will be lifted into high bay 1 and mated to the external fuel tank and twin solid rocket boosters. The entire Shuttle stack is scheduled to roll out of the VAB headed for Launch Pad 39B on Sept. 21. Discovery's STS-95 launch is targeted for Oct. 29 at 2 p.m.

NOTE TO EDITORS: Media interested in participating in a photo opportunity of the orbiter transfer must arrive at the KSC Press Site by 8:30 a.m. on Monday, Sept. 14. Media requiring accreditation should contact the KSC Press Site before close of business Friday, Sept. 11. A limited number of photographers will be escorted inside the VAB for an upper level view of the transfer aisle as the orbiter arrives. NASA video footage and still photos taken during the transfer will be available at the KSC Press Site and digital images will be available at www.ksc.nasa.gov under the Publisher's Photo Corner.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 11, 1998

KSC Contact: George H. Diller

KSC Release No. 100-98



MARS CLIMATE ORBITER ARRIVES AT KENNEDY SPACE CENTER TO BEGIN LAUNCH PREPARATIONS

NASA's Mars Climate Orbiter arrived at Kennedy Space Center today to begin final preparations for launch. The spacecraft arrived aboard an Air Force C-17 cargo plane at the Shuttle Landing Facility early this morning following its flight from the Lockheed Martin Astronautics plant in Denver, Colo. The launch of the Mars Climate Orbiter is scheduled to occur aboard a Boeing Delta II (7425) rocket on Dec. 10, 1998.

When it first arrives at the red planet, the Mars Climate Orbiter will be used primarily to support its companion Mars Polar Lander spacecraft, planned for launch on Jan. 3, 1999. After that, the Mars Climate Orbiter's instruments will monitor the Martian atmosphere and image the planet's surface on a daily basis for one Martian year, the equivalent of two Earth years. During this time, the spacecraft will observe the appearance and movement of atmospheric dust and water vapor, as well as characterize seasonal changes on the surface. The detailed images of the surface features will provide important clues to the planet's early climate history and give scientists more information about possible liquid water reserves beneath the surface.

The spacecraft is to be readied for launch in NASA's Spacecraft Assembly and Encapsulation Facility-2 (SAEF-2) located in the KSC Industrial Area. Among the processing activities to be performed in this clean room facility are a functional test of the science instruments and the basic spacecraft subsystems.

Checks of the communications system will be performed including a verification of the spacecraft's ability to send data via the tracking stations of the Deep Space Network to the Jet Propulsion Laboratory (JPL) in Pasadena, Calif. and the Lockheed Martin plant in Denver, Colo.

Following these checks, the spacecraft will be fueled with the spacecraft bipropellants of hydrazine and nitrogen tetroxide and mated to a Star 48 solid propellant upper stage booster. Finally, the combined spacecraft and upper stage elements will undergo spin balance testing.

Meanwhile, at Launch Complex 17, the Delta II rocket will be undergoing erection and prelaunch checkout by Boeing on Pad A. The first stage is scheduled to be installed into the launcher on Oct. 29. Four solid rocket boosters will be attached around the base of the first stage on Nov. 2. The second stage will be mated atop the first stage on Nov. 4, and the fairing will be hoisted into the clean room of the pad's mobile service tower Nov. 6.

The Mars Climate Orbiter with its upper stage booster will be transported to Complex 17 on Nov. 30 for hoisting atop the Delta and mating to the second stage. After the spacecraft undergoes a state of health check the next day, the two halves of the fairing will be placed around it on Dec. 3. Finally, there will be a mission dress rehearsal.

At liftoff, the spacecraft will weigh 1,418 pounds. It is 7.6 feet high, 6.4 feet deep, and 5.4 feet wide. Power is provided by a single large solar array which is 18.6 feet long and 6.8 feet across. After cruising in space for 286 days, the spacecraft will be captured in an elliptical orbit around Mars.

The eight-day primary launch period to achieve an optimum cruise phase and Mars planetary encounter begins with an instantaneous launch window at 1:56 p.m. EST, Dec. 10. There are two instantaneous windows each day. A secondary six-day period of launch opportunity begins Dec. 18. The last day available for launch is Dec. 25.

The 1998 Mars Climate Orbiter and Mars Polar Lander missions are managed by the Jet Propulsion Laboratory for NASA's Office of Space Science, Washington, D.C. JPL is a division of the California Institute of Technology, Pasadena, Calif. Lockheed Martin Astronautics, Denver, Colo. which built and operates the spacecraft, is JPL's industrial partner in the mission.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 10, 1998

KSC Contact: Joel Wells

KSC Release No. 101-98



Note to Editors:

KSC EMPLOYEES CHIP IN ELBOW GREASE FOR "DAYS OF CARING"

KSC's Community Relations Council sought out about 200 NASA and contractor employees to help spruce up Baxley Manor, a building of low-income apartments for senior citizens on Merritt Island, FL. Friday, Sept. 11 and Saturday, Sept. 12, KSC volunteers will paint the apartments and hall ways providing a much needed makeover.

Three shifts of volunteers will arrive at Baxley Manor at 8 a.m., 10 a.m. and at noon. A cleanup crew will prepare the rooms for painting by moving furniture, preparing walls and covering personal items. A Prep Team will wash the walls, repair holes and begin cut in painting. The Paint Team will paint the entire walls and the Customer Service Team will support team leaders with other small repair and cleaning jobs. Additional KSC workers will also provide companionship to the residents during the commotion of the day.

"Days of Caring" is one of many community outreach endeavors of which KSC's Community Relations Council is proud to be a part.

Baxley Manor is located at 615 Kurek Court on Merritt Island. KSC Community Relations Council members Carol Cavanaugh and Elizabeth Osborne can be reached at the work site on Friday and Saturday at 407-431-4811.

NOTE TO EDITORS: Images of Friday's work effort will be available at the KSC Press Site. Digital images are available at www.ksc.nasa.gov at KSC's [Publisher's Photo Corner](#).

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 16, 1998

KSC Contact: Joel Wells

KSC Release No. 102-98



SHUTTLE DISCOVERY SCHEDULED TO ROLLOUT TO LAUNCH PAD 39B SEPT. 21

Towering atop the mobile launcher platform and crawler transporter, Space Shuttle Discovery is scheduled to emerge from the Vehicle Assembly Building (VAB) on Monday, Sept. 21. Once at Launch Pad 39B, the orbiter, external tank and the solid rocket boosters will undergo final preparations for the STS-95 launch, currently targeted for Oct. 29, 1998.

At about 2 a.m. Monday, the crawler transporter is expected to begin its 4.2-mile trip to the pad. As the sun rises, Discovery will approach the pad slope and is scheduled to be hard down on the pad surface at about 8 a.m. The Rotating Service Structure will extend around the vehicle soon after pad arrival and launch pad validations will proceed through Tuesday night.

The crew of mission STS-95 includes: Commander Curt Brown, Pilot Steven Lindsey; Mission Specialists Scott Parazynski, Stephen Robinson, and Pedro Duque; and Payload Specialists Chiaki Mukai and John Glenn.

Along with Senator Glenn's momentous return to space, the primary objectives of this mission are to conduct microgravity research in the SPACEHAB module, deploy and retrieve the Spartan-201 solar-observing spacecraft, and perform experiments with the Hubble Space Telescope Orbital Systems Test (HOST) and the International Extreme Ultraviolet Hitchhiker.

The assortment of vertical payloads are set to arrive at the pad on Sept. 25 and be installed into the orbiter the following day.

The Shuttle flight crew will visit KSC in about three weeks to participate in the Terminal Countdown Demonstration Test (TCDT), set for Oct. 8 and 9. Media opportunities with the crew will be announced the week before the event.

NOTE TO EDITORS: Media needing accreditation to view Discovery's rollout should contact the KSC Press Site before close of business Friday, Sept. 18. The Press Site is scheduled to open at 10 p.m. Sunday and remain open through close of business Monday. Media can pick up badges from 10 p.m. Sunday through 12:30 a.m. Monday at the Pass and Identification Building on State Road 3, south of KSC. Media should plan on being at the Press Site no later than 1 a.m. for escort to the VAB. Weekend updated rollout information and Press Site hours of operation will be available by calling 407-867-2525.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 18, 1998

KSC Contact: George Diller/Lisa Malone

KSC Release No. 103-98



Note to Editors:

DEEP SPACE 1 VIEWING SCHEDULED FOR SEPT. 22 AT KSC

News media have an opportunity to view and discuss with a mission scientist NASA's Deep Space 1 spacecraft on Tuesday, Sept. 22, in KSC's Payload Hazardous Servicing Facility (PHSF).

Deep Space 1 is designed to validate a dozen new technologies for scientific space missions of the next century. These experiments include an ion propulsion engine that is strikingly similar to those described in futuristic science fiction works and software that tracks celestial bodies so that the spacecraft can make its own navigation decisions without the intervention of ground controllers.

Media should be at the KSC Press Site by 11 a.m., Tuesday, for transportation to the PHSF. Media will be returned to the KSC News Center in time for the 2 p.m. Deep Space 1 Mission Science Briefing originating from NASA Headquarters in Washington, D.C.

Media representatives needing accreditation should contact the NASA-KSC News Center at 407/867-2468 by the close of business Monday, Sept. 21.

Prior to being taken in the PHSF, media must submit to a routine security search of camera and utility bags. Due to clean room requirements, media planning to attend are requested to wear long pants and closed-toe shoes, and dress in clean room attire (bunny suits) which will be provided. No suede, leather or vinyl attire or accessories are permitted. Participants are asked not to wear makeup or lotions.

Quality control personnel will request photographers to clean their equipment with alcohol wipes and place accessories in special plastic bags which will be provided. No food, chewing gum, tobacco, lighters, matches, or pocket knives will be permitted inside the clean room. Also, no cellular telephones or transceiver-type radio equipment can be allowed.

Electronic flash photography is permitted. The lighting in the facility is high-pressure sodium (orange).

Leslie Livesay, Deep Space 1 Spacecraft Manager from the Jet Propulsion Laboratory, will be available for interviews about the Deep Space 1 spacecraft and its mission. This is the only opportunity scheduled for the media to photograph this spacecraft prior to launch.

The Deep Space 1 spacecraft is scheduled for launch at 6:59 a.m. on Oct. 25 aboard a Boeing Delta II rocket from Complex 17, Pad A, on Cape Canaveral Air Station. The

launch period extends through Nov. 10, 1998.

If the spacecraft continues to be healthy when the primary mission is completed on Sept. 18, 1999, NASA could choose to extend the spacecraft's voyage. Deep Space 1 may then be on a trajectory resulting in the flyby in January 2001 of the dormant comet Wilson-Harrington that is in the process of changing from a comet to an asteroid. In September 2001, the spacecraft may also fly by the active comet Borrelly.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 21, 1998

KSC Contact: George H. Diller

KSC Release No. 105-98



UNITY HATCH CLOSED FOR FLIGHT AT KSC

A milestone occurred yesterday in KSC's Space Station Processing Facility (SSPF) when the access hatch to the Unity connecting module was closed for flight.

"This is a significant event for the STS-88 test team because the next time the hatch will be opened will be by the astronauts on orbit," said Bob Webster, Chief, Assembly and Internationals Division for NASA at the Kennedy Space Center. "It means we're getting ready to fly," said Webster.

Unity will now undergo a series of leak checks, and there will be a final purge of clean, dry air inside the module to ready it for initial operations in space. The common berthing mechanism to which the other space station elements will dock will have some final preparations and testing and then be closed out for flight. The next major test for Unity is the Pad Demonstration Test which will occur on or about Oct. 1. This will verify the compatibility of the module with the Space Shuttle as well as the astronauts ability to send and receive commands to Unity from the flight deck of the orbiter. The final item of processing will be a weight and center of gravity determination.

On Oct. 25, Unity will be ready for installation into the payload canister to be transported to Launch Pad 39-A, currently planned to occur on Oct. 27.

Launch of Unity aboard Space Shuttle Endeavour on STS-88 remains targeted for Dec. 3.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 21, 1998

KSC Contact: Joel Wells

KSC Release No. 106-98



ATLANTIS SCHEDULED TO RETURN TO KSC AFTER 10 MONTHS IN PALMDALE, CA

Space Shuttle Atlantis is expected to arrive at KSC's Shuttle Landing Facility on Thursday, Sept. 24 riding atop NASA's modified Boeing 747 Shuttle Carrier Aircraft (SCA). Atlantis returns home after a 10-month stay in the Palmdale, CA, orbiter processing facility undergoing extensive inspections and modifications.

Atlantis arrived in Palmdale Nov. 14 for its second Orbiter Maintenance Down Period (OMDP), a scheduled action that removes an orbiter from flight operations for a periodic overhaul. This time orbiter Atlantis sustained about 130 modifications that include several upgrades enabling it to support International Space Station (ISS) missions.

Along with detailed nose-to-tail inspections and replacement of dated flight hardware, workers outfitted Atlantis with an external airlock equipping it for ISS docking missions. Installing thinner, lighter thermal protection blankets reduced the orbiter's weight by about 1,000 pounds. The weight savings allows the orbiter to haul heavier cargo like ISS components into space.

The Multifunctional Electronic Display System (MEDS) or "glass cockpit," also installed during this OMDP, brings Atlantis into the 1990's with respect to flight crew interaction. MEDS replaced the cockpit's four cathode ray tube screens, mechanical gauges, and instruments with full-color flat panel displays like those currently in use on modern commercial jet airliners or military aircraft. The previous electro-mechanical devices were becoming obsolete and more expensive to maintain.

NASA's SCA and orbiter will depart Palmdale at first light Wednesday morning and stop in Ft. Hood, TX, to refuel. The flight plan carries Atlantis on to Ft. Campbell, KY, for an over night stay. On Sept. 24, the ferry flight resumes in the afternoon and Atlantis is scheduled to return to KSC before sundown. All ferry flight plans are subject to weather and alternate landing sites maybe selected en route if necessary. The SCA and orbiter cannot fly through precipitation, thick clouds or high turbulence.

NOTE: There will be a photo opportunity of Atlantis' return to KSC. Interested news media should contact the KSC Press Site at 407-867-2468 Thursday morning for an update on the progress of the ferry flight.

Go to the [KSC Press Releases](#) Home Page



STS-95 Discovery U.S. Space Pioneer Returns to Earth Orbit

**KSC Release No. 107-98
October 1998**

[STS-95 images](#)

The National Aeronautics and Space Administration marks its 40th anniversary in October, the same month NASA is scheduled to return to space one of the country's original astronauts.

Mercury Project astronaut John Glenn became the first American to orbit Earth on Feb. 20, 1962. He will again make history when he returns to orbit 36 years later on STS-95 and becomes the oldest human to fly in space.

More than 80 experiments probing mysteries ranging from the inner universe of the human body to studies of our Sun will be conducted during the nine-day mission. The main objectives of the 92nd Space Shuttle flight are to perform microgravity research in a SPACEHAB single module, deploy and retrieve the Spartan-201 solar-observing spacecraft, and conduct operations with the Hubble Space Telescope Orbital Systems Test platform and the International Extreme Ultraviolet Hitchhiker.

A four-term Democratic senator from Ohio, the 77-year-old Glenn will be one of the chief subjects and operators of a series of experiments that will study the physiological correlation between the aging process on Earth and the effects of space flight on the human body. Bone and muscle loss, balance disorders, a depressed immune system and sleep disturbances are among the physiological responses shared by the elderly on Earth and space travelers.

Gerontologists hope that the research will help older people live more productive and active lives, and reduce the number of elderly requiring long-term medical care. In turn, space biomedical researchers believe that data collected from these will aid in planning for long-duration space flight on the International Space Station.

On its 25th flight, the Space Shuttle Discovery will lift off from Launch Pad 39B and ascend at a 28.5-degree inclination to the equator for direct insertion to a 345-statute-mile (300-nautical-mile/556-kilometer) orbit. Landing is planned at KSC's Shuttle Landing Facility.



The Crew

Leading the seven-member flight crew as mission commander will be four-time space flier Curt Brown, an Air Force lieutenant colonel. He was an instructor pilot and a test pilot in the Air Force before being selected for the astronaut program in 1987. He was the pilot on STS-47 in 1992, STS-66 in 1994 and STS-77 in 1996, and the commander of STS-85 in 1997.

Steven W. Lindsey, also a lieutenant colonel in the Air Force, will be the pilot. Lindsey had a varied career with the Air Force as a pilot, academic instructor and integrated product team leader responsible for weapons certification. He was chosen as an astronaut candidate in 1994 and flew once, as the pilot on STS-87 in 1997.

One of three mission specialists, Stephen K. Robinson (Ph.D.) also will serve as the payload commander. Robinson earned his doctorate in mechanical engineering from Stanford University while working as a research scientist at NASA's Ames Research Center in California. He was a scientist at NASA's Langley Research Center before being chosen for the astronaut program in 1994. He first flew as a mission specialist under Brown's command on STS-85.

Mission Specialist Scott E. Parazynski (M.D.) also will serve as the flight engineer. Parazynski earned his medical degree from Stanford Medical School and was in a residency program in emergency medicine when chosen as an astronaut candidate in 1992. He conducted physiology research at Ames Research Center, and flew twice as a mission specialist, on STS-66 with Brown and on STS-86 in 1997.

Mission Specialist Pedro Duque of Spain will make his first space flight. Duque was selected to join the astronaut corps of the European Space Agency (ESA) in 1992. He then qualified as a research astronaut for joint ESA-Russian missions. After serving as alternate payload specialist for STS-78 in 1996, he was chosen by ESA to attend NASA astronaut candidate training.

Payload specialists making their second space flight are Chiaki Mukai (M.D., Ph.D.), representing the National Space Development Agency of Japan (NASDA); and Sen. John Herschel Glenn Jr. (Col., USMC, retired).

Mukai, a cardiovascular surgeon, received a medical degree and a doctorate in physiology from Keio University in Tokyo. She was selected by NASDA as a payload specialist candidate in 1985, and was the first Japanese female to fly in space on STS-65 in 1994. Mukai is a research instructor at Baylor College of Medicine in Texas and a visiting associate professor at the Keio University School of Medicine.

At 77, Glenn will be the oldest person to fly in space by 16 years. The Marine combat pilot and test pilot flew the Mercury-Atlas 6 "Friendship 7" spacecraft, circling Earth three times on the first manned U.S. orbital mission. He later was a business executive until his election to the Senate in 1974. He has nine honorary doctoral degrees. Glenn still flies his own plane and in 1996 set his second flight speed record. This will be his first Shuttle flight.



Payload Bay Experiments

SPACEHAB experiments – Investigations focusing on microgravity sciences, advanced technology and life sciences will be conducted inside a pressurized SPACEHAB single module. Besides NASA, the diverse SPACEHAB experiments are sponsored by ESA, NASDA and the Canadian Space Agency. The geriatric studies include an evaluation of bone cell activity in microgravity, a protein turnover experiment on the effects of space flight on whole-body and skeletal muscle protein metabolism, and an investigation of the effectiveness of the pineal hormone melatonin as an hypnotic during space flight.

Spartan-201-5 -- This is a reflight of the Spartan payload which developed problems shortly after deployment on STS-87 last year and was recaptured by astronauts during a spacewalk. Spartan-201 will investigate the physical conditions and processes of the solar corona and the solar winds that influence orbiting satellites and weather conditions on Earth which, in turn, affect television and phone communications. The free-flying platform will be deployed on flight day 4 and retrieved by Discovery's robot arm two days later. Spartan-201 with its two instruments, the Ultraviolet Coronal Spectrometer and the White Light Coronagraph, successfully flew on three previous missions. Secondary investigations include the Technology Experiment Augmenting Spartan (TEXAS) for radio frequency communications; the Video Guidance Sensor to test a key component of the automated rendezvous and capture system; and the Space Experiment Module for educational experiments.

International Extreme Ultraviolet Hitchhiker – IEH-03 is comprised of seven experiments, including a small satellite that will be deployed on flight day 3. The non-recoverable Petite Amateur Navy Satellite (PANSAT) stores and transmits digital communications. Other IEH investigations are the Solar Extreme Ultraviolet Hitchhiker, Spectrograph/Telescope for Astronomical Research, Solar Constant experiment (SOLCON), Ultraviolet Spectrograph Telescope for Astronomical Research (UVSTAR), and two Get-Away Special (GAS) canister experiments. The IEH experiments are mounted on a Hitchhiker bridge in Discovery's payload bay. Two other GAS can experiments which are not part of IEH are attached to the side of the cargo bay.

Cryogenic Thermal Storage Unit Flight Experiment -- The fifth in a series of Hitchhiker cryogenic test bed payloads, CRYOTSU will be housed in a canister attached to the side of Discovery's payload bay. CRYOTSU is designed to demonstrate the functionality of four spacecraft thermal control devices in the weightlessness of space.

Hubble Space Telescope Orbital Systems Test -- HOST will provide an on-orbit test bed for studying the effects of radiation and zero gravity on the performance of components planned for installation during the third Hubble Space Telescope servicing mission, targeted for 2000. HOST also will evaluate new technologies such as an advanced cooling system for science instruments.

Middeck Experiments

The **Electronic Nose** is an experimental instrument to identify atmospheric compounds for monitoring the air quality on the Space Shuttle and International Space Station. Based on the human nose, its thin polymer sensors can detect both organic and inorganic compounds. Other middeck experiments include the **Biological Research in Canisters** to investigate the effects of space flight on small arthropod animal and plant specimens, and the **Protein Crystal Growth-Single Locker Thermal Enclosure System**.

Space Flight Retrospective

The Mercury-Atlas vehicle which Glenn flew into space had a launch weight of less than 1/18th and a liftoff thrust of about 1/20th of the Space Shuttle – less than the thrust produced by just one of the Shuttle's three main engines. At 72 feet high, the Mercury-Atlas was about 2.5 times shorter than the 184.2-foot-tall Shuttle.

Only one astronaut could fit into the Mercury capsule, while the orbiter can accommodate up to 10 people in an emergency.

Glenn, the oldest of the Mercury astronauts, was 40 when he experienced a maximum of 8 g's on his first flight; he will be subject to no more than 3g's on STS-95. He was strapped in for the nearly five-hour duration of his first space flight; this time, he will be able to float weightless during the nine-day mission.

While Glenn was the first *American* to orbit Earth in 1962, the first *human* was Yuri Gagarin of the Soviet Union, who spent 108 minutes making one orbit of Earth in his Vostok 1 spacecraft 10 months earlier.

GO TO THE [KSC FACT SHEETS](#) HOME PAGE

GO TO THE [KSC PRESS RELEASES](#) HOME PAGE



JOHN F. KENNEDY SPACE CENTER

September 24, 1998

KSC Contact: Lisa Malone

KSC Release No. 108-98



DR. WILLIAM BARRY TO HEAD NASA'S OCCUPATIONAL HEALTH PROGRAM

KSC Director Roy Bridges announced today that William S. Barry, M.D., has been selected to head NASA's Occupational Health Program (OHP). In this Senior Executive Service position, Barry will provide policy, guidance and evaluation of the effectiveness of the NASA program effort of nearly 400 health professionals at 10 research and space centers nationwide. Last year, KSC was identified as NASA's lead center for occupational health.

Barry has extensive medical and management experience in hospitals, private practice, industry and the military. He began his career as a flight surgeon with the U.S. Navy, advancing to the rank of Commander before his entry into the private sector in 1977. He served on the USS Midway and the USS Saratoga during the Vietnam War and represented the Navy on the Joint Service "Operation Homecoming," providing treatment and evaluation of returning prisoners of war at Clark Air Force Base, the Philippines.

Following his naval career, Barry joined The Upjohn Company as manager of Health Surveillance, eventually becoming director, Worldwide Drug Experience. In 1991, Barry joined the Battle Creek Health System, Tampa, as director of the Department of Occupational Medicine and Health. In 1996, Barry took on the role of director, Occupational and Preventive Health Services of Florida Hospital, Heartland Division. In these leadership roles, Barry set strategic direction, ensuring the businesses grew while continuing to provide an environment conducive to employee occupational health.

"I believe Dr. Barry's broad experience with both military and public venues makes him an outstanding choice as manager of the Occupational Health Program," said Bridges. "The role of lead center for NASA's OHP office provides an excellent opportunity for an innovative physician to establish an effective program in an agency involved in exciting cutting edge technology for the 21st century."

The OHP oversees occupational medical clinics and programs in the areas of health education and wellness, industrial and radiological health, employee assistance, workers' compensation, public health, physical fitness and allied occupational health. Major goals are to recognize, evaluate and control health hazards associated with chemical, physical and biological agents; prevent occupational injury and illness; provide quality health care and counseling; avoid or delay the onset of premature employee death and disability; assess and document Agency compliance with all applicable legal and regulatory requirements.

Barry will be responsible to Dr. Irene Long, director of the Biomedical Office at KSC, for administration of the OHP, but will also work closely with the staff of the Chief Medical Officer at NASA Headquarters in Washington, DC.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 24, 1998

KSC Contact: Lisa Malone

KSC Release No. 109-98



KSC BIOMEDICAL DIRECTOR RECEIVES OUTSTANDING ACHIEVEMENT AWARD

Irene D. Long, M.D., director of the Biomedical Office at Kennedy Space Center, has been presented with the 1998 Outstanding Achievement Award by Women in Aerospace. The award recognizes Dr. Long's contribution to the fields of aerospace and occupational medicine, life sciences research, environmental health and operational management of life sciences support facilities. The presentation was made Sept. 23 at the Rayburn House Office Building on Capitol Hill in Washington, DC.

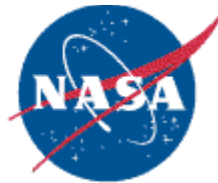
Dr. Long is one of six women recognized by the society this year. Among them was Marta Bohn-Meyer, deputy director for Flight Operations, at NASA's Dryden Flight Research Center. Bohn-Meyer received the Aerospace Educator Award.

Women in Aerospace is a nonprofit, professional society dedicated to expanding women's opportunities for leadership and to increase their visibility in the aerospace community. In a career where she has risen steadily to a position of senior management in the U.S. space program, Dr. Long is a role model for women embarking on careers in medicine and the aerospace sciences. As Director of the Biomedical Office at the center, she has encouraged those working in her office to pursue advanced education and opportunities for self-development.

Dr. Long has made many contributions to aerospace education. Among them, she is active in the center's educational outreach agenda and is one of the founders of the Space Life Sciences Training Program. The program introduces college students to the field of Space Life Sciences and also aims to increase the number of women and minorities in science and related fields. Also, at KSC, Dr. Long has been a strong supporter of new technology systems in order to improve operations and ensure the health and safety of employees. She introduced the Center-wide Toxic Substance Registry System (TSRS) which maintains inventories of toxic substances used and stored onsite.

Dr. Long has served as director of the Biomedical Office since 1994. Prior to that she served as chief of the Medical and Environmental Health Office at the center. She has been at KSC since 1982.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 28, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 110-98



Note to Editors:

KSC DEEP SPACE 1 VIEWING RESCHEDULED FOR SEPT. 29

A rescheduled news media viewing of NASA's Deep Space 1 spacecraft has been set for Tuesday, Sept. 29, in KSC's Payload Hazardous Servicing Facility (PHSF).

Deep Space 1 is designed to validate a dozen new technologies for scientific space missions of the next century. These experiments include an ion propulsion engine that is strikingly similar to those described in futuristic science fiction works and software that tracks celestial bodies so that the spacecraft can make its own navigation decisions without the intervention of ground controllers.

Media should be at the KSC Press Site by 10 a.m., Tuesday, for transportation to the PHSF. Those needing accreditation should contact the KSC News Center at 407/867-2468.

Prior to being taken in the PHSF, media must submit to a routine security search of camera and utility bags. Due to clean room requirements, media planning to attend are requested to wear long pants and closed-toe shoes, and dress in clean room attire (bunny suits) which will be provided. No suede, leather or vinyl attire or accessories are permitted. Participants are asked not to wear makeup or lotions.

Quality control personnel will request photographers to clean their equipment with alcohol wipes and place accessories in special plastic bags which will be provided. No food, chewing gum, tobacco, lighters, matches, or pocket knives will be permitted inside the clean room. Also, no cellular telephones or transceiver-type radio equipment can be allowed.

Electronic flash photography is permitted. The lighting in the facility is high-pressure sodium (orange).

Leslie Livesay, Deep Space 1 Spacecraft Manager from the Jet Propulsion Laboratory, will be available for interviews about the Deep Space 1 spacecraft and its mission. This is the only opportunity scheduled for the media to photograph this spacecraft prior to launch.

Launch of Deep Space 1 is scheduled for Oct. 25 at 6:59 a.m. aboard a Boeing Delta II rocket from Complex 17, Pad A, on Cape Canaveral Air Station. The launch period extends through Nov. 10, 1998.

If the health of the spacecraft permits, NASA may choose to extend the Deep Space 1 voyage following completion of the primary mission on Sept. 18, 1999. The spacecraft could be placed on a trajectory resulting in the flyby in January 2001 of the dormant comet

Wilson-Harrington that is in the process of changing from a comet to an asteroid. In September 2001, the spacecraft may also fly by the active comet Borrelly.

Go to the [KSC Press Releases](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

September 30, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 111-98



Note to Editors:

MEDIA OPPORTUNITIES WITH STS-95 CREW SET FOR NEXT WEEK AT KSC

The crew of Space Shuttle mission STS-95 will be at Kennedy Space Center Oct. 6-9 for the Terminal Countdown Demonstration Test (TCDT). A number of media events will be conducted during the time the crew is at KSC, many of which will be carried live on NASA Television.

News media needing credentials for the published activities (see below) should call the KSC News Center at 407-867-2468. STS-95 launch credential requests will be honored for TCDT and separate requests are not necessary. News media with proper authorization may obtain their STS-95 mission credentials at the Pass and Identification Building (PID) on State Road 3 on Merritt Island during published times. The PID's schedule for TCDT is listed below.

The TCDT is held at KSC prior to each Space Shuttle flight, providing the crew of each mission an opportunity to participate in simulated countdown activities. The TCDT ends with a mock launch countdown culminating in a simulated main engine cut-off. The crew also spends time undergoing emergency egress training exercises at the pad and has an opportunity to view and inspect the payloads in the orbiter's payload bay.

The seven-member crew of mission STS-95 is scheduled to arrive at KSC's Shuttle Landing Facility (SLF) at about 3 p.m. Tuesday, Oct. 6. Media who desire to view crew arrival should be at the KSC Press Site by 2 p.m. for transport to the SLF.

In addition to other planned activities, on Thursday, Oct. 8, news media representatives will have an opportunity to speak informally with and photograph the entire crew at Pad 39B. Media interested in participating in this question and answer session should be at the KSC Press Site by 12:15 p.m. Thursday for transport to the pad. This media opportunity will only last for about 30 minutes and it will be carried live on NASA TV.

On Friday, Oct. 9, the crew will take part in simulated launch day events. Full NASA TV coverage is planned with commentary beginning at 6 a.m. Crew breakfast, suit-up and walkout events will be televised. At the pad, the crew will enter the orbiter Discovery fully suited for the simulated Shuttle main engine ignition and cut-off. Following TCDT, the crew is scheduled to depart KSC for their homes in Houston for final flight preparations.

Discovery is targeted for launch on Oct. 29 at 2 p.m. EST. Mission STS-95 is scheduled to last 8 days, 22 hours and will feature the return to space of John Glenn, the first American to orbit the Earth. Landing of Discovery is scheduled for mid-day Nov. 7 at Kennedy Space Center's Shuttle Landing Facility.

Crew members for mission STS-91 are: Commander Curt Brown; Pilot Steven Lindsey; Mission Specialists Scott Parazynski, Stephen Robinson, and Pedro Duque; and Payload Specialists Chiaki Mukai and John Glenn.

KSC News Center office hours for STS-95 TCDT

- Tuesday, Oct. 6 ----- 8 a.m. - 4:30 p.m.
- Wednesday, Oct. 7 ----- 6:30 a.m. - 4:30 p.m.
- Thursday, Oct. 8 ----- 8 a.m. - 4:30 p.m.
- Friday, Oct. 9 ----- 5 a.m. - 4:30 p.m.

Media must be under public affairs escort at all times while at KSC except when driving to or from the News Center or the Complex 39 cafeteria. Media are allowed at the KSC Press Site only when public affairs personnel are on duty and the NASA News Center is open.

News media may obtain STS-95 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, (south of KSC) during the following times:

Pass and Identification Hours of Operation

- Tuesday, Oct. 6 ----- 11:30 a.m. - 1:30 p.m.
- Thursday, Oct. 8 ----- 8 a.m. - 11:30 a.m.

TCDT timeline for Friday, Oct. 9: 6 a.m.

**Public affairs commentary begins from Firing Room 1 in the Launch Control Center with live NASA TV coverage of the day's activities*

6:05 a.m. Crew wake up
7:05 a.m. Weather briefing
6:35 a.m. *Crew breakfast
7:30 a.m. *Crew suit-up
7:45 a.m. *Depart for pad. Crew walkout of quarters and transport to Pad B
8:15 a.m. *Crew arrival at pad and ingress into orbiter
9:30 a.m. *Hatch closure
11:00 a.m. *Countdown test concludes with a simulated main engine cutoff (followed by rehearsal of emergency egress activities at pad)
11:30 a.m. *Crew egress from vehicle

**Televised events (times may vary slightly)*

TCDT activities available to the media are listed below:

Oct. 6 ----- 3 p.m. ----- (Depart Press Site at 2 p.m.)

*Crew arrival at SLF. The crew will arrive in T-38 training aircraft from their homes in Houston, TX. They are expected to make brief statements to the media immediately following their arrival at the Shuttle Landing Facility. This event will be covered live on NASA TV.

Oct. 7 ----- 8:15 a.m. ----- (Depart Press Site at 7:30 a.m.)

M1-13 training. This event involves the crew being trained in a small armored personnel carrier. The tracked vehicle could be used by the crew in the event of an emergency at the pad during which the crew must make a quick exit from the area. This exercise is standard for all flight crews and their support personnel who would be on the pad surface with them prior to launch. The event will be conducted near the launch pad.

Oct. 8 ----- 10 a.m.

*Press Conference. A press conference featuring a NASA Test Director (NTD) is planned in order to explain the purpose of the countdown test and answer questions on launch team and crew activities. It will be carried live on NASA TV with two-way Q&A from other NASA centers. The conference will be held in

the KSC Press Site Auditorium.

Oct. 8 ----- 1:15 p.m. ----- (Depart Press Site at 12:15 p.m.)

***Crew Q & A at Pad 39B. This event will include two-way Q&A live on NASA TV outside at the slide wire basket drop point, or the bunker area, inside the pad's perimeter fence. Media will be permitted to speak informally with the crew using the pad and Shuttle Discovery as a backdrop. Due to the tightly scheduled crew timeline, the event will only last about 30 minutes. You must be present at the pad to ask questions.**

Oct. 9 ----- 7:45 a.m. ----- (Depart Press Site at 6:45 a.m.)

***Crew walkout at O&C. This event is generally recommended for photographers only since no dialog with the crew will occur and they are only visible for a few moments -- from the time they walk out of the building, which houses the crew quarters, to the time they enter the astronaut van. Once in the van, they are driven out to the pad. Since space outside the Occupation and Checkout Building (O&C) is limited, participants must sign-up ahead of time at the Press Site.**

Oct. 9 ----- 2 p.m. ----- (Depart Press Site at 1 p.m.)

Crew departure from SLF. Following the simulated launch day events, the crew will depart KSC the same way they arrived - via T-38s at the Shuttle Landing Facility. The crew are not expected to make statements to the media. This is generally considered a photo opportunity only.

**Live on NASA TV*

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 30, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 112-98



Note to Editors:

US POSTAL SERVICE TO UNVEIL SPACE DISCOVERY STAMPS AT KSC

News media are invited to attend a ceremonial kickoff of National Stamp Collecting Month at KSC's Visitor Complex as the U.S. Postal Service makes its first day issuance of a pane of stamps called "Space Discovery" commemorating space exploration. The event, which coincides with NASA's 40th anniversary, will take place in the Shuttle Plaza area at 11 a.m. with comments by Astronaut Donald Thomas, a veteran of four Shuttle missions.

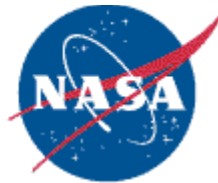
Others on hand for the issuance of the stamps will be KSC Associate Director of Advanced Development and Shuttle Upgrades JoAnn Morgan and Postal Service Inspector General Karla Corcoran.

Various exhibits and activities are planned during the day to open up the worlds of space exploration and stamp collecting to young and old alike. Approximately 200 local students are scheduled to be on hand for the stamps' unveiling.

The stamps were designed by renowned aerospace artist Attila Heija. The strip of five individual stamps come together to make up a futuristic scene, complete with space vehicles, a futuristic space city, and space explorers. 185 million of the .32-cent stamps have been printed and will be available in post offices nationwide beginning Oct. 1.

For additional information on National Stamp Collecting contact Barry Ziehl, U.S. Postal Service, 202-268-4782.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 1, 1998

KSC Contact: George Diller

KSC Release No. 113-98



MARS POLAR LANDER ARRIVES AT KENNEDY SPACE CENTER

NASA's Mars Polar Lander arrived at Kennedy Space Center today to begin final preparations for launch. The spacecraft arrived aboard an Air Force C-17 cargo plane which landed at KSC's Shuttle Landing Facility early this morning following its flight from the Lockheed Martin Astronautics plant in Denver, CO. The launch of the Mars Polar Lander is targeted to occur aboard a Boeing Delta II rocket on Jan. 3, 1999. This will be the second spacecraft to be launched in the pair of Mars '98 missions. The Mars Climate Orbiter is planned for launch on Dec. 10, 1998.

The solar-powered spacecraft is designed to touch down on the Martian surface near the northern-most boundary of the south pole. This is near the edge of Mars' thin, carbon dioxide ice sheet which will have receded by the time the lander arrives in December 1999, late spring in the southern hemisphere of Mars. The mission's objective is to study the water cycle at the Martian south pole. The lander also will help scientists learn more about climate change and current resources on Mars, studying such things as frosts, dust, water vapor and condensates in the Martian atmosphere.

The Mars Polar Lander is to be readied for launch in NASA's Spacecraft Assembly and Encapsulation Facility-2 (SAEF-2) located in the KSC Industrial Area. Among the activities to be performed will be a functional test of the science instruments and the basic spacecraft subsystems. Checkout of the communications system will be performed, including a verification of the spacecraft's ability to send data to controllers on Earth via the Mars Climate Orbiter and the tracking stations of the Deep Space Network. The spacecraft's radar, used during the final descent, will be installed and the solar arrays will be attached and tested.

The Deep Space 2 microprobes will also be installed on the lander's cruise ring. These two probes, developed by NASA's New Millennium Program will test technology and instruments to search for water several feet below the Martian surface. The spacecraft will then be ready for mating with the cruise stage and parachutes used for the trip through the lower Martian atmosphere will then be installed.

Next, the spacecraft will be fueled with its attitude control fuel and undergo spin balance testing. Finally, on Dec. 15, the spacecraft will be mated to a Star 48 solid propellant upper stage booster and then prepared for transportation to the launch pad.

Meanwhile, at Launch Complex 17, the Delta II rocket will be undergoing erection and prelaunch checkout on Pad B. The first stage is scheduled to be installed into the launcher on Nov. 23. Four solid rocket boosters will be attached around the base of the first stage

beginning on Nov. 25. The second stage will be mated atop the first stage on Dec. 2, and the fairing will be hoisted into the clean room of the pad's mobile service tower Dec. 3.

The Mars Polar Lander with its upper stage booster will be transported to Complex 17 on Dec. 21 for hoisting atop the Delta and mating to the second stage. After the spacecraft undergoes a state of health check, the spacecraft will be closed out for flight and on Dec. 29 the two halves of the Delta nose fairing placed around it. At liftoff, the spacecraft weighs 1,270 pounds (576 kilograms), is 3.6 feet (106 centimeters) tall, and 12 feet (360 centimeters) long.

Launch is planned to occur at the opening of an instantaneous launch window on Jan. 3, 1999 at 3:31 p.m. EST. The nominal launch period is divided into an eight-day primary period (Jan. 3-10) followed by a six-day secondary launch period (Jan. 11-16). The planetary window closes on Jan. 27, 1999.

After an 11-month cruise phase, the Mars Polar Lander will arrive at the planet and begin its descent to the surface. An imager onboard the spacecraft will take high resolution photographs during the descent to the surface to establish the geological and physical context of the landing site. A robotic arm will be powered up soon after landing to begin exploring this unknown region with an elaborate, 6.6-foot-long (2-meter) robotic scoop, which will dig shallow trenches to further investigate Mars' climatic history.

The lander also will conduct soil analysis experiments on the surface, using a small "chemistry set" and "oven" to determine the thermal properties and evolved gasses in frozen water and dust. Martian surface temperatures, winds, pressure and the amount of dust in the atmosphere will be measured on a daily basis, while a small microphone records the sounds of wind gusts or mechanical operations onboard the spacecraft.

The 1998 Mars Climate Orbiter and Mars Polar Lander missions are managed by the Jet Propulsion Laboratory for NASA's Office of Space Science, Washington, D.C. JPL is a division of the California Institute of Technology, Pasadena, CA. Lockheed Martin Astronautics, Denver CO, which built and operates the spacecraft, is JPL's space industry partner in the mission. Launch is the responsibility of NASA's John F. Kennedy Space Center. The Boeing Company is KSC's space industry partner in launch operations.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 6, 1998

KSC Contact: Joel Wells

KSC Release No. 116-98



KENNEDY SPACE CENTER AND FLORIDA PLAN NEW LIFE SCIENCES FACILITY

NASA Kennedy Space Center and Spaceport Florida Authority (SFA) have agreed to begin plans to construct a \$15 million, 100,000-square-foot facility on KSC property to function as a research laboratory. Officials expect the facility to support domestic and international experiments that will fly aboard the International Space Station, Space Shuttle, and future proposed reusable launch vehicles such as VentureStar.

KSC's current life sciences facilities are cramped and decentralized. A new facility will help managers consolidate the majority of KSC's life sciences research activities in one location and replace the old Hangar L facility. Hangar L, located across the Banana River from KSC, was modified in the early 1980's into a laboratory facility and has become too small to support the processing needs of current life sciences Shuttle missions. The old facility is also becoming expensive to operate and maintain.

"This will be another stepping stone on Kennedy's path to the future," said KSC Director Roy Bridges. "Day by day we are focusing more on research and development endeavors at KSC and a new Life Sciences Research Facility is the kind of resource we need to get our job done. It also promises new opportunities for the private sector."

The facility concept features a variety of biological specimen holding areas and laboratories. Equipped to support ecological, developmental, physiological, and molecular experiments, the laboratories will serve researchers from a broad range of life sciences disciplines. Ongoing KSC efforts to develop a bioregenerative life support system for long duration space travel and ecological investigations aimed at understanding the Merritt Island coastal eco-system are two research efforts that could prosper with upgraded resources.

SFA will finance and construct the KSC designed facility on the west side of KSC's industrial area. NASA will lease a major portion of this facility from SFA and make the facilities available to the Kennedy's Life Sciences Support Contractor, Dynamac Corporation, who processes NASA's life sciences experiments and conducts much of the laboratory research and technology development activities.

Officials expect other governmental, academic, commercial, and international research programs to take advantage of the new facility. Construction begins in mid 1999 and completion is expected by 2001. This facility is the first phase in the development of a research industrial campus capable of serving a host of organizations involved in space related research.

Spaceport Florida Authority was established by Florida's governor and legislature to serve the growth needs of the State's space industry, including the development and conversion of infrastructure for space transportation, manufacturing, education, and research and development.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 8, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 117-98



Note to Editors:

MEDIA INVITED TO COVER KSC'S EMPLOYEE OPEN HOUSE SATURDAY, OCT. 10

Media representatives are invited to cover Kennedy Space Center's Annual Employee Open House this Saturday, Oct. 10. Space Center employees with their family and friends will be visiting various KSC and Cape Canaveral Air Station facilities throughout the day.

Interested media who desire to cover the open house should be at the KSC Press Site between the hours of 10 a.m. - 2 p.m. for public affairs escort to locations open to employee viewing.

Facilities that will be open include Launch Pad 39B, where Discovery is poised for launch later this month. The Rotating Service Structure will be retracted from around the orbiter for viewing opportunities. Other locations open to visitors include the Shuttle Landing Facility, the Space Station Processing Facility, the Vehicle Assembly Building, the Orbiter Processing Facility, and the Launch Control Center.

For additional information please call the KSC News Center.

Go to the [KSC Press Releases](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

October 13, 1998

KSC Contact: George H. Diller

KSC Release No. 118-98



Note to Editors:

MARS '98 SPACECRAFT PHOTO OPPORTUNITY AT KSC FRIDAY, OCT. 16

NASA's Mars Climate Orbiter spacecraft and Mars Polar Lander spacecraft, to be launched aboard Delta rockets in December and January respectively, are the subject of a news media opportunity on Friday, Oct. 16.

Media representatives will be taken inside the clean room at the SAEF-2 spacecraft checkout facility located in the KSC Industrial Area. Because planetary contamination controls are in effect at SAEF-2, strict clean room protocol will be observed.

Those planning to attend are requested to wear long pants and closed-toe shoes. Clean room attire (bunny suits) will be furnished. Quality control personnel will request cleaning of photographic equipment with alcohol wipes which will be provided. No suede, leather or vinyl attire or accessories are permitted. Please do not wear perfume, cologne or makeup. Special plastic bags will be provided for photographic accessories. No graphite pencils, food, tobacco, lighters, matches, or pocket knives will be permitted inside the clean room. Electronic flash photography is permitted. The lighting in the facility is mercury vapor. Spokesmen from the Jet Propulsion Laboratory and Lockheed Martin, builders of the spacecraft, will be available to answer questions and for interviews.

Those needing accreditation should contact the NASA News Center at 407/867-2468 by the close of business Thursday, Oct. 15. The departure from the KSC News Center for SAEF-2 will be at 10:30 a.m. on Friday, Oct. 15.

The Mars Polar Lander is designed to touch down on the Martian surface near the northern-most boundary of the south pole to search for water in the Martian soil. It will also help scientists learn more about the climate change and the current resources on Mars, studying such things as frosts, dust, water vapor and condensates in the Martian atmosphere.

The Mars Climate Orbiter will be used to support its companion Mars Polar Lander spacecraft. After the lander's primary mission is complete, the orbiter's instruments will monitor the atmosphere and image the planet's surface on a daily basis for one Martian year, the equivalent of two earth years. During this time, the spacecraft will observe the appearance and movement of atmospheric dust and water vapor, as well as characterize seasonal changes on the surface.

The launch of the Mars Climate Orbiter is currently scheduled for Dec. 10, 1998. The Mars Polar Lander is planned for launch on Jan. 3, 1999. Both spacecraft will be launched on a

Boeing Delta II rocket from Launch Complex 17 on Cape Canaveral Air Station.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 13, 1998

KSC Contact: Lisa Malone/Bruce Buckingham

KSC Release No. 119-98



OFFICIAL LAUNCH DATE SET FOR STS-95 MISSION

NASA program managers today set Oct. 29 as the official launch date for the STS-95 mission aboard the Shuttle Discovery, a scheduled nine-day flight in which the seven astronauts will conduct more than eighty scientific experiments investigating mysteries that span the realm from the inner universe of the human body to studies of our own Sun. The mission marks the return of John Glenn to space, 36 years after his history-making flight aboard Friendship 7 in February 1962 as the first American to orbit the Earth.

The Flight Readiness Review held at the Kennedy Space Center in Florida today was the final major review by all Shuttle project offices to evaluate the readiness of the flight crew and vehicle, along with launch and mission control flight teams.

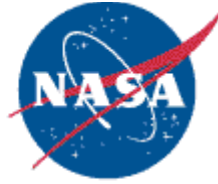
"This flight will demonstrate the flexibility and importance of the Space Shuttle through the vast array of scientific experiments and a challenging on orbit crew timeline. Also, as we observe NASA's 40th anniversary this month, we have the unique opportunity to refly the first American to orbit the earth. John Glenn is certain to see, first hand, the advances in human space flight from the early beginning of the Mercury program to the construction of the International Space Station," said JSC Director George Abbey.

Discovery is scheduled for launch on Oct. 29 at 2 p.m. EST from Launch Pad 39B at the opening of a 2 1/2 hour launch window. The STS-95 mission is scheduled to last 8 days, 21 hours, and 50 minutes. An on-time launch would result in a landing by Discovery at the Kennedy Space Center on Saturday, Nov. 7 at 11:50 a.m. EST.

The STS-95 Mission Commander is Curt Brown. The pilot will be Steven Lindsey. Steve Robinson, Scott Parazynski and European Space Agency (ESA) astronaut Pedro Duque will serve as Mission Specialists. Glenn and Chiaki Mukai from the Japanese Space Agency (NASDA) will fly as Payload Specialists.

STS-95 will be the 25th flight of Discovery and the 92nd mission in Shuttle program history.

For complete biographical information on the STS-95 crew and other astronauts, see the NASA Internet astronaut biography home page at URL: <http://www.jsc.nasa.gov/Bios/>. For additional information on the STS-95 mission, visit the Shuttle home page at <http://www.shuttle.nasa.gov> or the electronic press kit at <http://www.shuttlepresskit.com>



JOHN F. KENNEDY SPACE CENTER

October 19, 1998

KSC Contact: George H. Diller

KSC Release No. 121-98



Note to Editors/News Directors:

DEEP SPACE 1 PLANNED FOR LAUNCH ON DELTA II ROCKET OCT. 24

The launch of NASA's Deep Space 1 spacecraft aboard a Boeing Delta II rocket is targeted to occur on Saturday, Oct. 24, 1998. The launch window is 8:00:10 a.m. - 8:48:51 a.m. EDT, a duration of 48 minutes, 41 seconds. Liftoff will occur from Pad A at Launch Complex 17 on Cape Canaveral Air Station.

The launch of Deep Space 1 on Oct. 24 is predicated upon an on-time launch of a commercial Pegasus rocket currently scheduled for Oct. 22. Should a second-day launch opportunity be required for Pegasus, the launch of Deep Space 1 will happen a day later than currently targeted, occurring on Oct. 25. The launch window on Sunday is 6:59:50 a.m. - 7:46 a.m. EST, a duration of 46 minutes, sixteen seconds.

Deep Space 1 is designed to validate 12 new technologies for scientific space missions of the next century. The goal is to make spacecraft smaller, less expensive and more autonomous.

Among the experiments aboard is an ion propulsion engine strikingly similar to those described in futuristic science fiction works. Also being validated is software that tracks celestial bodies so that the spacecraft can make its own navigation decisions without the intervention of ground controllers.

Deep Space 1 has completed final checkout and was mated to the Boeing Delta II (7326) rocket on Oct. 12. It was encapsulated in the Delta's nose fairing for launch on Oct. 16.

PRELAUNCH NEWS CONFERENCE

A prelaunch news conference is planned for Friday, Oct. 23 at 11 a.m. in the KSC News Center auditorium and will be carried live on NASA Television. Participating in the briefing will be:

- Dr. Marc D. Rayman, Chief Mission Engineer, Deep Space 1
Jet Propulsion Laboratory
- Rich Murphy, Director of Launch Sites
Boeing Company
- Ray Lugo, NASA Launch Manager
Kennedy Space Center

- Bruce Clark, Delta Launch Vehicle Manager,
NASA Goddard Space Flight Center
- Leslie Livesay, Spacecraft Manager, Deep Space 1
Jet Propulsion Laboratory
- Joel Tumbiolo, Launch Weather Officer,
Department of the Air Force, 45th Weather Squadron

Should the Deep Space 1 launch be rescheduled for Sunday, Oct. 25, the prelaunch news conference will be held on Saturday, Oct. 24, at 11 a.m. EDT.

No post-launch news conference is planned.

ACCREDITATION

Those media without permanent accreditation who wish to cover the launch of Deep Space 1 including the prelaunch news conference on L-1 day should send a letter of request to the NASA-KSC News Center on news organization letterhead. It should include name and Social Security number or passport number. Letters should be faxed to 407/867-2692 or addressed to:

Deep Space 1 Launch Accreditation
NASA AB-F1
Kennedy Space Center, FL 32899

Deep Space 1 mission badges may be picked up on Friday, Oct. 23, at the News Media Pass & Identification building located at Gate 2 on SR 3, Merritt Island 8 - 11 a.m. On launch day, Deep Space 1 mission badges will be available at Gate 1 on Cape Canaveral Air Station located on SR 401 starting at 6:30 a.m. immediately prior to departure for Press Site 1. Should the launch be rescheduled for Oct. 25, mission badges will be issued at 5:30 a.m.

STS-95 mission badges will be valid for the prelaunch news conference on L-1 day. However, a Deep Space 1 mission badge is required for all media covering the launch from Press Site 1 on launch day. For further information on Deep Space 1 launch accreditation contact Selina Scolah at the NASA News Center at 407/867-2468.

REMOTE CAMERAS

On L-1 day at 9 a.m. a NASA van will depart from the NASA-KSC News Center for Launch Complex 17 for media photographers who wish to establish remote cameras at the pad.

LAUNCH DAY COVERAGE

Media covering the launch should assemble at Gate 1 of Cape Canaveral Air Station at 6:30 a.m. on Saturday, Oct. 24, to convoy to Press Site 1. Should launch be rescheduled for Sunday, Oct. 25, media should assemble at Gate 1 at 5:30 a.m. After launch and spacecraft separation, media may leave via Gate 1 only.

The codaphone will carry Deep Space 1 prelaunch status reports beginning on Thursday, Oct. 22 and may be dialed at 407/867-2525. This status report will be updated should the Oct. 24 target launch date change to Oct. 25 as result of the Pegasus launch attempt.

NASA TELEVISION AND V CIRCUIT COVERAGE

NASA Television will carry the prelaunch news conference starting at 11 a.m. EDT on Friday, Oct. 23. On launch day, Saturday, Oct. 24, countdown coverage will begin at 6:30 a.m. EDT and continue until a successful launch can be confirmed. This occurs upon acquisition of Deep Space 1 by the Deep Space Network's tracking station at Canberra, Australia, approximately 90 minutes after launch.

Should the first launch attempt occur on Sunday, Oct. 25, commentary will begin at 5:30 a.m. EST.

NASA Television is available on GE-2, transponder 9C, located at 85 degrees West longitude. Audio only of all Deep Space 1 activities will also be available on the "V" circuits which may be dialed directly at 407/867-1220, 1240 or 1260.

Go to the [KSC Press Releases](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

October 20, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 122-98



Notice to Editors/News Directors:

MISSION STS-95 EVENTS, NEWS CENTER OPERATING HOURS SET

News conferences, events and operating hours for KSC's News Center have been set for the Oct. 29 launch of the Space Shuttle Discovery on Mission STS-95, the 92nd launch in the Shuttle program. The conferences and events (as noted) are scheduled to be carried live on NASA Television unless otherwise noted.

The seven STS-95 crew members are scheduled to arrive at KSC on Monday, Oct. 26, at about 2 p.m. EST. News media representatives planning to cover the event must be at the News Center by 1 p.m. Monday (in the event of a possible early crew arrival) for transportation to the Shuttle Landing Facility.

News media representatives needing credentials for crew arrival should call the KSC News Center at 867-2468 to make arrangements.

News media representatives with proper authorization may obtain STS-95 mission credentials at the Pass and Identification Building on State Road 3 (south of KSC) on Merritt Island during published times. (Credential and badging hours are listed below.)

In addition to STS-95 daily countdown status briefings, there will be two pre-launch press conferences the day before launch featuring mission managers and scientists. Also, daily tours will be offered of KSC facilities and historic launch sites at Cape Canaveral Air Station. (A listing of available briefings and tours is attached.)

-- end of general release --

STS-95 BRIEFING & EVENTS SCHEDULE *(all times are EST)*

(All briefings are held inside the KSC Press Site auditorium and will be carried live on NASA TV unless otherwise noted)

L-3 Days - Monday, Oct. 26 (Launch countdown begins at 8 a.m.)

9 a.m. ----- Countdown Status Briefing

- Doug Lyons, NASA Test Director
- Todd Corey, STS-95 Payload Manager
- Ed Priselac, Shuttle Weather Officer

2 p.m. ----- STS-95 Flight Crew Arrival *(Live on NASA TV)*

L-2 Days - Tuesday, Oct. 27

10 a.m. ----- Friendship 7 Briefing

- Walt Kapryan, former NASA Spacecraft Project Engineer
- Paul Donnelly, former NASA Spacecraft Test Conductor
- Tom O'Malley, former Booster Test Conductor, General Dynamics
- George Page, former Assistant Booster Test Conductor, General Dynamics

1 p.m. ----- Countdown Status Briefing

- Doug Lyons, NASA Test Director
- Jim Wetherbee, Director, Flight Crew Operations
- Todd Corey, STS-95 Payload Manager
- Ed Priselac, Shuttle Weather Officer

2 p.m. ----- STS-95 Life Sciences Overview Briefing

- Dr. Arnauld Nicogossian, Assoc. Admin. for the Office of Life & Microgravity Sciences
- Dr. Robert Butler, President/CEO International Longevity Center
- Dr. Andrew Monjan, Chief, Neurobiology Aging Branch, National Institute of Aging, NIH
- Professor Larry Young, Director, National Space & Biomedical Research Institute, MIT
- Dr. Charles Czeisler, Director of the Circadian, Neuroendocrine and Sleep Disorders, Brigham and Women's Hospital, Boston, MA

3:30 p.m. ----- STS-95 Space Sciences Overview Briefing

- Dr. Ed Weiler, Acting Associate Administrator for Space Science, HQ
- Dr. Ed Cheng, HOST Principal Investigator, Goddard Space Flight Center
- Dick Fisher, Spartan Project Scientist, Goddard Space Flight Center

L-1 Day - Wednesday, Oct. 28

9 a.m. ----- Countdown Status Briefing

- Steve Altemus, NASA Test Director
- Todd Corey, STS-95 Payload Manager
- Ed Priselac, Shuttle Weather Officer

11 a.m. ----- Canadian Space Agency Briefing (Local Only)

**1 p.m. ----- Pre-launch News Conference (Panel 1 - Launch Readiness)
(This briefing will be held outside in the KSC grandstands)**

- Tommy Holloway, Shuttle Program Manager, NASA, Johnson Space Center
- Jim Wetherbee, Director, Flight Crew Operations
- Bob Sieck, Director of Shuttle Operations, NASA, Kennedy Space Center
- Captain Clif Stargardt, Staff Meteorologist, 45th Weather Squadron, USAF

**2 p.m. ----- Pre-launch News Conference (Panel 2 - Management Briefing)
(This briefing will be held outside in the KSC grandstands)**

- Joe Rothenberg, Associate Administrator, Office of Space Flight
- Dr. Ed Weiler, Acting Associate Administrator for Space Science
- Dr. Arnauld Nicogossian, Assoc. Admin. for the Office of Life & Microgravity Sciences
- Dr. Richard J. Hodes, Director, National Institute of Aging
- Jorg Feustel Buechl, Director, Manned Space & Microgravity, European Space Agency
- Mr. Susumu Yoshitomi, STS-95 Project Manager, NASDA

6 p.m. ----- European Space Agency Briefing (Local Only)

Launch Day - Thursday, Oct. 29

8 a.m. ----- NASA Television live launch programming begins

Launch Day Crew activities:

7:50 a.m. --- Crew wake up

*9:35 a.m. --- Breakfast

10:15 a.m. - Weather briefing and suit up

*10:30 a.m. - Suit up

*10:45 a.m. - Walkout

*11:15 a.m. - Arrive at pad

*12:30 p.m. - Close hatch

***2 p.m.** ----- **Launch of Discovery**

(*live on NASA TV)

Launch + 1 hour ----- Post-launch Press Conference

- Donald R. McMonagle, Manager, Launch Integration for the Space Shuttle Program
- Ralph Roe, KSC Launch Director

Launch + 2 hours ----- Japanese Space Agency Briefing (Local Only)

KSC News Center office hours for STS-95

(hours may be adjusted for in-flight events)

Saturday, Oct. 24 ----- Deep Space 1 launch ---- 6:30 a.m. - 4:30 p.m.

Sunday, Oct. 25 ----- (Launch minus 4 days) --- 8 a.m. - 4:30 p.m.

Monday, Oct. 26 ----- (Launch minus 3 days) --- 6 a.m. -----

Tuesday, Oct. 27 ----- (Launch minus 2 days) --- -- 24-hours --

Wednesday, Oct. 28 ----- (Launch minus 1 day) ----- -- 24-hours --

Thursday, Oct. 29 ----- (Launch) Flight day 1 ----- 12 midnight

Friday, Oct. 30 ----- Flight day 2 ----- 8 a.m. - 4:30 p.m.

Sat./Sun., Oct. 31-Nov. 1 -- Flight days 3-4 ----- 3 - 5 p.m. (status briefings)

Mon.-Thurs., Nov. 2-5 ---- Flight days 5-8 ----- 8 a.m. ----- 4:30 p.m.

Friday, Nov. 6 ----- Flight day 9 ----- 8 a.m. - 12 midnight

Saturday, Nov. 7 ----- (Landing) Flight day 10 ---- 8 a.m. - 12 midnight

(Times may be adjusted in real time depending on mission events and timelines.)

News media may obtain STS-95 mission credentials at the Pass and Identification Building at Gate 2 on State Road 3, Merritt Island, during the following times:

Pass and Identification Hours

Saturday, Oct. 24 ----- 8 a.m. - 12 noon

Sunday, Oct. 25 ----- 8 a.m. - 12 noon

Monday, Oct. 26 ----- 8 a.m. - 4:30 p.m.

Tuesday, Oct. 27 ----- 8 a.m. - 4:30 p.m.

Wednesday, Oct. 28 ----- 8 a.m. - 8 p.m.

Thursday, Oct. 29 ----- 6 a.m. - 1 p.m.

News media with annual Shuttle credentials are reminded to sign the log book at the query counter in the News Center.

NEWS MEDIA ARE REQUIRED TO BE UNDER PUBLIC AFFAIRS ESCORT AT ALL TIMES WHILE AT KSC EXCEPT WHEN DRIVING TO THE NEWS CENTER OR THE COMPLEX 39 CAFETERIA.

NEWS MEDIA ARE ALLOWED AT THE PRESS SITE ONLY WHEN PUBLIC AFFAIRS PERSONNEL ARE ON DUTY AND THE NASA NEWS CENTER IS OPEN.

**List of KSC Media Tours and Events
for Launch of STS-95**
(Please sign-up at the Press site for all events)

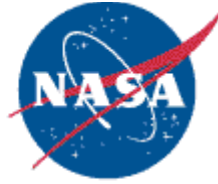
Date	Time	Event
Oct. 26 Monday L-3	10 a.m.	Historic Tour: Tour old launch complex 5/6 (point of Shepard's launch), launch complex 14 (point of Glenn's first launch), Old Mission Control, and Hangar S (first astronaut quarters and spacecraft test and checkout facility).
--	2 p.m. (Depart at 1 p.m.)	Astronaut arrival at SLF: The entire crew of Shuttle mission STS-95 will arrive in T-38 training aircraft from their homes in Houston, TX. All are expected to make brief statements to the media immediately following their arrival at the Shuttle Landing Facility. This event will be covered live on NASA TV. Each crew member is expected to make a brief statement.
--	3 p.m.	KSC Tour: Media tour of various facilities and locations at KSC, including: Launch Complex 39 area locations (Launch Pad 39B, VAB, OPF) and the Space Station Processing Facility (current location of ISS hardware).
--	5:15 p.m. (Depart at 4:15 p.m.)	STA Departure: Commander Curt Brown and Pilot Steve Lindsey are scheduled to depart the SLF to fly in the Shuttle Training Aircraft (STA). They will be dressed in their Shuttle launch and entry suits.
Oct. 27 Tuesday L-2	10 a.m.	Historic Tour: Tour old launch complex 5/6 (point of Shepard's launch), launch complex 14 (point of Glenn's first launch), Old Mission Control, and Hangar S (first astronaut quarters and spacecraft test and checkout facility).
--	3 p.m.	KSC Tour: Media tour of various facilities and locations at KSC, including: Launch Complex 39 area locations (Launch Pad 39B, VAB, OPF) and the Space Station Processing Facility (current location of ISS hardware).
Oct. 28 Wed. L-1	10:50 a.m. (Depart at 9:50 a.m.)	T-38 Flight Departure: All STS-95 crew members are scheduled to fly in their T-38 training aircraft from the Shuttle Landing Facility. The non-pilot astronauts will fly in the T-38 back seats.
--	1 p.m.	KSC Tour: Media tour of various facilities and locations at KSC, including: Launch Complex 39 area locations (Launch Pad 39B, VAB, OPF) and the Space Station Processing Facility (current location of ISS hardware).
--	1:30 p.m.	Historic Tour: Tour old launch complex 5/6 (point of Shepard's launch), launch complex 14 (point of Glenn's first launch), Old Mission Control, and Hangar (first astronaut quarters and spacecraft test and checkout facility).
--	8 p.m. (Depart at 7 p.m.)	RSS Rollback at Pad: Media will be taken to the pad for a photo opportunity of the Rotating Service Structure (RSS) being retracted from around the Shuttle, exposing the orbiter for launch configuration. Once the RSS is back, the Xenon pad lights will be turned on illuminating the Shuttle in white light. Locations for shots will be from Beach Road and from the Shuttle crawlerway, in front of the Shuttle on the pad.

		(Sunset occurs at 5:41 p.m.)
Oct. 29 Thursday L-0	10:45 a.m. (Depart at 9:45 a.m.)	Crew walkout at O&C: This event is generally recommended for photographers since no dialog with the crew will occur and they are only visible for a few moments before they enter the Astronaut van and are driven to the pad. Space outside the O&C is limited. Sign-up ahead of time at the Press Site.

Go to the [KSC Press Releases Home Page](#)

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

October 21, 1998

KSC Contact: George H. Diller

KSC Release No. 123-98



Note to Editors/News Directors:

STS-88 "UNITY" MEDIA OPPORTUNITY AT KSC OCT. 23

Unity, the first International Space Station element to be launched on STS-88, will be installed into the payload transportation canister at the Space Station Processing Facility (SSPF) on Oct. 23. This is the final step in prelaunch processing for Unity before it is transported to Launch Pad 39A on Monday, Oct. 26. Unity is a connecting passageway to the living and working areas of the International Space Station.

Media are invited to witness this milestone in International Space Station processing this Friday, Oct. 23. Departure from KSC press site will be at 12:30 p.m. NASA and Boeing spokespersons will be available at the SSPF during the activity for interviews and to answer questions.

Those attending the event are requested to wear long pants and closed-toe shoes. While clean room attire will not be required for this event, no food, tobacco, lighters, matches or pocket knives are permitted inside the facility. A routine search of camera bags by KSC security personnel should be anticipated. Electronic flash photography is permitted. The lighting in the facility is mercury vapor.

Those needing accreditation for this event should contact the KSC News Center at 407/867-2468.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 21, 1998

KSC Contact: Joel Wells

KSC Release No. 124-98



ENDEAVOUR ROLLS TO LAUNCH PAD 39A READY FOR FIRST U.S. SPACE STATION LAUNCH

Towering atop the mobile launcher platform and crawler transporter, Space Shuttle Endeavour rolled from the Vehicle Assembly Building today en route to Launch Pad 39A. The orbiter, external tank and the solid rocket boosters will now undergo final preparations for the STS-88 launch, currently targeted for Dec. 3, 1998.

At 2:18 a.m. the crawler transporter began its 3.4-mile trek to the pad. Endeavour was hard down on the pad surface at about 7:30 a.m. The Rotating Service Structure will extend around the vehicle tomorrow morning following a scheduled test of the auxiliary power units.

Mission STS-88 will be the first U.S. International Space Station launch and will carry the U.S.-made Unity Connecting Module into orbit. The flight crew will deploy Unity from Endeavour's payload bay and then connect it to Zarya, the Russian Control Module. Russia is targeting a Nov. 30 launch date for Zarya. Unity is scheduled to arrive at pad 39A Oct. 26 for installation into Endeavour's payload bay.

Commander Bob Cabana, Pilot Rick Sturckow; Mission Specialists Nancy Currie, Jerry Ross, Jim Newman and Sergei Krikalev make up the 6-member STS-88 flight crew. The crew will visit KSC to participate in the Terminal Countdown Demonstration Test on Nov. 5 and 6.

NOTE TO EDITORS: Video footage and still photos taken of the roll out and pad arrival are available at the KSC Press Site. Digital images are available at www.ksc.nasa.gov

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 21, 1998

KSC Contact: Joel Wells

KSC Release No. 125-98



SPACE SHUTTLE MISSION STS-95 LAUNCH COUNTDOWN TO BEGIN OCT. 26

NASA will begin the countdown for launch of Space Shuttle Discovery on mission STS- 95 on Oct. 26, at 8 a.m. EST at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 1 of the Launch Control Center.

The countdown includes 35 hours of built-in hold time leading to an opening of the launch window at 2 p.m. on Oct. 29. The launch window extends for 2 hours and 30 minutes.

This will be the fourth Space Shuttle mission of the year. Mission STS-95 will mark the 25th flight of the orbiter Discovery and the 92nd flight overall in NASA's Space Shuttle program. STS-95 is slated to last 8 days, 21 hours, 49 minutes. Discovery is scheduled to land at KSC at 11:49 a.m. on Nov. 7.

The primary objectives of this mission are to conduct microgravity research in the SPACEHAB module, deploy and retrieve the Spartan-201 solar-observing spacecraft, and perform experiments with the Hubble Space Telescope Orbital Systems Test (HOST) and the International Extreme Ultraviolet Hitchhiker (IEH-03). U.S. space pioneer John Glenn will work with Japanese astronaut Chiaki Mukai to investigate the correlation between the aging process on earth and physiological effects of space flight on the human body.

Discovery was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 2 on Sept. 14 and then mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was transported to pad 39B on Sept. 21.

The STS-95 crew consists of: Commander Curt Brown, Pilot Steve Lindsey, Mission Specialists Scott Parazynski, Stephen Robinson, Pedro Duque and Payload Specialists Chiaki Mukai and John Glenn.

The crew is scheduled to arrive at KSC at about 2 p.m., Monday, Oct. 26. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES

*all times are Eastern

Launch - 3 Days (Monday, Oct. 26)

- Prepare for the start of the STS-91 launch countdown
- Perform the call-to-stations (7:30 a.m.)
- All members of the launch team report to their respective consoles in Firing Room 1 in the Launch Control Center for the start of the countdown

- Countdown begins at the T-43 hour mark (8 a.m.)
- Begin final vehicle and facility close-outs for launch
 - Check out back-up flight systems
 - Review flight software stored in mass memory units and display systems
 - Load backup flight system software into Discovery's general purpose computers
 - Activate and test navigational systems (9 p.m.)
 - Complete preparations to load power reactant storage and distribution system (11 p.m.)

Launch - 2 Days (Tuesday, Oct. 27)

Enter first planned built-in hold at T-27 hours for duration of four hours (12 midnight)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers
- Open launch pad to personnel supporting PRSD load

Resume countdown (4 a.m.)

- Begin operations to load cryogenic reactants into Discovery's fuel cell storage tanks (4 a.m. - 12 noon)

Enter four-hour built-in hold at T-19 hours (12 noon)

- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Resume orbiter and ground support equipment close-outs
- SPACEHAB late stow activities begin (3 p.m.)

Resume countdown (4 p.m.)

- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Close-out the tail service masts on the mobile launcher platform

Enter planned hold at T-11 hours for 23 hours, 40 minutes (12 midnight)

Launch - 1 Day (Wednesday, Oct. 28)

- Begin vertical payload closeouts
- Activate the orbiter's flight controls and navigation systems
- Begin startracker functional checks
- Activate orbiter's inertial measurement units
- Install film in numerous cameras on the launch pad
- Activate the orbiter's communications systems
- Flight crew equipment late stow begins (3:30 p.m.)
- Fill pad sound suppression system water tank
- Safety personnel conduct debris walk down
- Move Rotating Service Structure (RSS) to the park position (8 p.m.)
- Perform orbiter ascent switch list in crew cabin
- Start fuel cell flow-through purge

Resume countdown (11:40 p.m.)

- Activate the orbiter's fuel cells

Launch Day (Thursday, Oct. 29)

- Configure communications at Mission Control, Houston, for launch

- Clear the blast danger area of all non-essential personnel
- Switch Discovery's purge air to gaseous nitrogen
- Complete inertial measurement unit activation

Enter planned one-hour built-in hold at the T-6 hour mark (4:40 a.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel

Resume countdown (5:40 a.m.)

- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 5:40 a.m.)
- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 8:40 a.m.)

Enter planned two-hour built-in hold at T-3 hours (8:40 a.m.)

- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Close-out crew and Final Inspection Team proceed to Launch Pad 39B

Resume countdown at T-3 hours (10:40 a.m.)

- Perform open loop test with Eastern Range
- Crew departs Operations and Checkout Building for the pad (about 10:45 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 11:15 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Discovery's crew hatch (about 12:30 p.m.)
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Close-out crew moves to fallback area (about 1:20 p.m.)
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (1:20 p.m.)

- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (1:30 p.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 10-minute hold at T-9 minutes (1:41 p.m.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (1:51 p.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)

- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-6:15)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-0:6.6 seconds)
- SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-95

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	12 a.m. Tues.	4 a.m. Tues.
T-19 hours	4 hours	12 p.m. Tues.	4 p.m. Tues.
T-11 hours	23 hours, 40 minutes	12 a.m. Wed.	11:40 p.m. Wed.
T-6 hours	1 hour	4:40 a.m. Thurs.	5:40 a.m. Thurs.
T-3 hours	2 hours	8:40 a.m. Thurs.	10:40 a.m. Thurs.
T-20 minutes	10 minutes	1:20 p.m. Thurs.	1:30 p.m. Thurs.
T-9 minutes	10 minutes	1:41 p.m. Thurs.	1:51 p.m. Thurs.

CREW FOR MISSION STS-95

Commander (CDR):	Curt Brown
Pilot (PLT):	Stephen Lindsey
Mission Specialist (MS1):	Stephen Robinson
Mission Specialist (MS2):	Scott Parazynski
Mission Specialist (MS3):	Pedro Duque
Payload Specialist (PS1):	Chiaki Mukai
Payload Specialist (PS2):	John Glenn

SUMMARY OF STS-95 LAUNCH DAY CREW ACTIVITIES

Thursday, Oct. 29

7:50 a.m.	Wake up
* 9:35 a.m.	Breakfast/crew photo
10:05 a.m.	Weather briefing
*10:30 a.m.	Flight crew don launch and entry suits
*10:45 a.m.	Depart for Launch Pad 39B
*11:15 a.m.	Arrive at white room and begin ingress
*12:30 p.m.	Close crew hatch
* 2:00 p.m.	Launch

*Televised events (times may vary slightly)

All times Eastern

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 21, 1998

KSC Contact: Joel Wells

KSC Release No. 126-98



AIRSPACE, BRIDGES AND WATERWAY RESTRICTIONS IN EFFECT FOR ALL SPACE SHUTTLE LAUNCHES

A number of restrictions are placed in effect around the Kennedy Space Center (KSC) during the hours immediately preceding and following the launch of a Space Shuttle.

Listed and described below are restrictions that apply to pilots, motor vehicle operators and boaters utilizing airspace, bridges and waterways that lead to KSC.

KSC AREA AVIATION RESTRICTIONS

The airspace immediately above and around KSC will be limited to official aircraft only and will be off-limits to general aviation pilots prior to and during the launch of a Space Shuttle.

NOTAMS must be checked by pilots prior to flights near the KSC area. Pilots are warned that violations of KSC's restricted airspace may likely result in serious penalties, including the suspension or revocation of pilot privileges.

Official aircraft supporting the launch will be in the air. Private pilots must be aware that wandering into a restricted area is not only forbidden, but that it also creates a safety hazard to support aircraft and the errant pilot.

Anyone wishing to view the launch from the air below 11,000 feet should stay west of the Indian River. Above 11,000 feet, pilots should stay west of the St. Johns River. Pilots are advised that the airspace in the KSC vicinity is expected to be congested with both controlled and uncontrolled aircraft.

Pilots should also be aware of the Solid Rocket Booster (SRB) exhaust cloud that occurs after launch. They should stay at least five miles away from the cloud, even if it drifts out of the restricted area. Research aircraft will be flying into and around the cloud, and visibility will be limited.

Generally, the airspace restrictions cover a variety of air ranges. In addition to the usual KSC and Cape Canaveral Air Station airspace restrictions, the upcoming launch requires that all private aircraft stay out of an area roughly bounded by the west side of the Indian River to the west, the Trident Basin (Port Canaveral) to the south, Haulover Canal to the north and 30 miles seaward to the east. These restrictions are "surface to unlimited." Launch-specific restrictions begin three hours prior to the planned launch time.

Pilots should consult the most recent editions of the Jacksonville Sectional Aeronautical

Chart and the Airman's Information Manual. In addition, they should contact the St. Petersburg Flight Service Station at 1-800-992-7433. (1-800-WX-BRIEF) Advisories will be available from the Patrick Approach Control (VHF 134.95 megahertz), Space Center Executive Airport Tower (VHF 118.9 megahertz) or the NASA Tower (128.55 megahertz).

Pilots should also refer to the current Patrick Air Force Base news release concerning restricted airspace.

BRIDGES CONTROLLED FOR LAUNCH

The opening and closing of bridges over waterways surrounding KSC will be strictly controlled during the hours immediately before and after the launch period for each Space Shuttle mission.

Bridges affected by the launch include:

- Canaveral Harbor Barge Canal (SR 401, south of Cape Canaveral Air Station's Gate 1);
- Indian River Causeway West or NASA Causeway (Intracoastal Waterway at Addison Point);
- Merritt Island Barge Canal (Merritt Island State Road 3);
- Haulover Canal Bridge (State Road 3, north of KSC).

Restraints on bridge openings for boat traffic begin three hours before launch. The bridges may be opened for five minutes at the following points in the launch countdown: T-180 minutes, T-150 minutes, T-120 minutes, T-90 minutes, and T-65 minutes. Adding 20 minutes to these times and subtracting that amount from the launch time will result in an approximate time of openings.

Bridges will remain closed to boat traffic until 90 minutes after lift-off (T+90). They may then open for five minutes at T+90, T+120 minutes and T+150 minutes. Bridge operations will return to normal three hours (T+180 minutes) after launch.

Should the Shuttle be required to perform a Return-to-Launch-Site (RTL) landing at KSC, all bridges would remain closed to boat traffic from 45 minutes before landing until at least one hour after landing.

KSC AREA BOATING RESTRICTIONS

Waterways and boating near the Kennedy Space Center will be strictly controlled prior to and during the launch of the Space Shuttle.

Safety and security requirements, including U.S. Air Force range safety impact limit lines, will go into effect as early as three days before launch. Other requirements will be phased into effect through sunset the night before launch. A general description of the area follows:

BANANA RIVER: Security limits begin at the Banana River Barge Canal south of KSC at the State Road 528 crossing and extend north. This restriction is effective roughly 12 hours prior to launch.

ATLANTIC OCEAN: Beginning the day before launch, a general exclusion zone will be

in effect three miles offshore from the Haulover Canal, near the north end of KSC, and southward to Port Canaveral. Four hours prior to launch, all ocean-going traffic will be restricted from entering an area measured from five miles north and south of the launch pad and extending 30 miles east into the ocean. Pad 39A is located at latitude 28 degrees, 36 minutes, 29.7014 seconds north; longitude 80 degrees, 36 minutes, 15.4166 seconds west. Pad 39B is located at latitude 28 degrees, 37 minutes, 26 seconds north; longitude 80 degrees, 37 minutes, 15.09 seconds west. An additional three-mile-wide exclusion zone will be extended eastward along the projected flight path of the Space Shuttle.

MOSQUITO LAGOON: This area south of the Haulover Canal is off limits to all boats beginning the day before launch.

INDIAN RIVER: Restrictions apply from the NASA Causeway north to the Haulover Canal and east of the Indian River's main channel. Restrictions begin the day before launch.

All boating restrictions will be lifted approximately one hour after launch.

The U.S. Coast Guard, the U.S. Fish and Wildlife Service, and KSC security forces share responsibility for enforcing the boating guidelines.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 22, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 127-98



PLAYALINDA BEACH TO CLOSE FOR SHUTTLE LAUNCH

Playalinda Beach will be closed to the public beginning Saturday, Oct. 24, due to the planned launch of the Space Shuttle Discovery on Mission STS-95. Given a successful launch on Thursday, Oct. 29, the beach will reopen to the public at 6 a.m. the following day.

The countdown leading to the 92nd Space Shuttle flight begins at 8 a.m. Monday, Oct. 26. Safety and security concerns require that Playalinda Beach be closed to the public throughout the Shuttle launch countdown.

Launch of Discovery is set for 2 p.m. EST on Thursday.

Beachgoers wishing additional information on Playalinda Beach or the Canaveral National Seashore may call the National Park Service at 407/867-0677.

Other Canaveral National Seashore beaches, such as Apollo Beach, will not be affected by the referenced closing and will remain open during Discovery's launch. Access to these beaches is through New Smyrna Beach.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 23, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 128-98



Notice to Editors:

KSC PRESS SITE PARKING LOT TO FILL QUICKLY; ALTERNATE SUGGESTED

Parking at the KSC Press Site will be at a premium as upwards of 3500 media to date have requested credentials to attend the launch of Space Shuttle Mission STS-95 on Thursday, Oct. 29. On launch day and the days before, the Press Site parking lot will fill quickly to capacity. As it does, arriving media will be directed to park across the street from the Press Site in a sectioned off area of the Vehicle Assembly Building (VAB) parking lot. No parking will be permitted on the Press site mound beginning L-3 days.

In anticipation of these lots filling quickly, additional overflow parking has been designated at the southwest corner of the intersection of NASA Causeway and State Road 3 (Kennedy Parkway). Media directed to park in this lot will be able to catch a shuttle bus to and from the KSC Press Site throughout the day.

It is expected that it will be necessary to use this overflow parking lot beginning Wednesday, Oct. 28 (L-1), through launch day, Oct. 29. Media expecting to arrive at the Press Site later than 10 a.m. on L-1 or later than 6 a.m. on launch day are advised to use this lot.

Once the Press Site and the VAB parking lots are full, guards will instruct media to park in the overflow lot. It is recommend that media plan to park in this overflow lot on L-1 and launch day or risk adding about 45 minutes to your arrival time. Parking in the overflow lot on these days will save you time.

If you must drop off heavy equipment at the Press Site after the lots are full, guards will permit you to temporarily enter, but you will be required to leave and park in the overflow areas.

Any cars abandoned on the road side or in non-designated parking areas will be towed at the owner's expense and your press credentials may be revoked.

Due to added security measures, additional delays in arriving at the Press Site may be experienced and extra drive time may be required. Plan to arrive early.

Also, please remember that media are required to be under Public Affairs escort at all times while at KSC except when driving to the News Center or the Complex 39 cafeteria.



JOHN F. KENNEDY SPACE CENTER

October 26, 1998

George H. Diller
407/867-2468

KSC Release No. 130-98

SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

For the Space Shuttle, weather "outlooks" provided by the U. S. Air Force Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days in coordination with the NOAA National Weather Service Spaceflight Meteorology Group (SMG) at the Johnson Space Center in Houston. These include weather trends and their possible effects on launch day. A formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

Launch weather forecasts, ground operations forecasts, and launch weather briefings for the Mission Management Team and the Space Shuttle Launch Director are prepared by the Range Weather Operations Facility. Forecasts which apply after launch are prepared by SMG. These include all emergency landing forecasts and the end of mission forecasts briefed by SMG to the astronauts, the Flight Director and Mission Management Team.

During the countdown, formal weather briefings occur approximately as follows:

L-24 hr 0 min: Briefing for Flight Director and astronauts
L-21 hr 0 min: Briefing for removal of Rotating Service Structure
L-9 hr 00 min: Briefing for external tank fuel loading
L-4 hr 30 min: Briefing for Space Shuttle Launch Director
L-3 hr 55 min: Briefing for astronauts
L-2 hr 10 min: Briefing for Flight Director
L-0 hr 35 min: Briefing for launch and RTLS
L-0 hr 13 min: Poll all weather constraints

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.

b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	Relative Humidity				
	(kts)	0-64%	65-74%	75-79%	80-89%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 30 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies and may be as low as 21 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.

- Do not launch if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch. Launch may occur if the source of lightning has moved more than 10 nautical miles away from the pad or the flight path and a field mill, used to measure electric fields, is located within 5 nautical miles of the lightning flash.

- The one-minute average of the electric field mill network may not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad or the lightning flash at any time within 15 minutes prior to launch. This field mill criteria becomes -1.5 or + 1.5 kilovolts per meter if there are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.

- Do not launch when lightning is observed and the cloud which produced the lightning is within 10 nautical miles of the flight path. Launch may not occur until 30 minutes has elapsed since the lightning flash, or the cloud has moved more than 10 nautical miles away.

Clouds: (types known to contain hazardous electric fields)

- Do not launch if any part of the planned flight path is through a layer of clouds any part of which is within 5 nautical miles is 4,500 feet thick or greater and the temperature of any part of the layer is between 32 degrees F. and -4 degrees F. Launch may occur if the cloud layer is a cirrus-like cloud that has never been associated with convective clouds, is located entirely at temperatures of 5 degrees F. or colder, and shows no evidence of containing water droplets.
- Do not launch through cumulus type clouds with tops higher than the 41 degree F. temperature level. Launch may occur through clouds as cold as 23 degrees F. if the cloud is not producing precipitation, and all field mills within 5 nautical miles of the flight path and at least one field mill within 2 nautical miles of the cloud center read between -100 volts per meter and +500 volts per meter.
- Do not launch 1.) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 2) through or within 10 nautical miles of the nearest edge of cumulus clouds with tops higher than the -4 degrees F. level.
- Do not launch if the flight path is through any non-transparent clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation, or melting precipitation, within five nautical miles of the flight path.
- Do not launch through an attached anvil cloud. If lightning occurs in the anvil or the associated main cloud, do not launch within 10 nautical miles for the first 30 minutes after lightning is observed, or within 5 nautical miles from 30 minutes to 3 hours after lightning is observed.
- Do not launch if the flight path will carry the vehicle:
 - a.) through non-transparent parts of a detached anvil for the first three hours after the anvil detaches from the parent cloud, or the first four hours after the last lightning occurs in the detached anvil.
 - b.) within 10 nautical miles of non-transparent parts of a detached anvil for the first thirty minutes after the time of the last lightning in the parent or anvil cloud before detachment, or the detached anvil after its detachment.
 - c.) within 5 nautical miles of non-transparent parts of a detached anvil for the first three hours after the time of the last lightning in the parent or anvil cloud before detachment, or the detached anvil after detachment, unless there is a field mill within 5 nautical miles of the detached anvil reading less than 1,000 volts per meter for the last 15 minutes and a maximum radar returns from any part of the detached anvil within 5 nautical miles of the flight path have been less than 10 dbz (light rain) for 15 minutes.
- Do not launch if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected in the debris cloud (less than 10 dbz by radar) within 5 nautical miles of the flight path.
- Do not launch if the flight path will carry the vehicle through any cumulus cloud that has developed from a smoke plume while the cloud is attached to the plume, or for the first 60 minutes after the cumulus cloud detaches from the smoke plume.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				July			
Temp	Low	Avg	High	Temp	Low	Avg	High
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- Direct visual observation of the Shuttle is required through 8,000 feet. This requirement may be satisfied using optical tracking sites or a forward observer
- For cloud ceilings of any thickness between 6,000 feet and 8,000 feet the following conditions must be met for launch to occur:

- a.) the vehicle integrity can be observed without interruption through 6,000 feet.
- b.) all required Range Safety instrumentation is functioning properly
- c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

- For cloud ceilings between 4,000 feet and 6,000 feet the following conditions must be met for launch to proceed:

- a.) the thickness of the clouds must be less than 500 feet
- b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8,000 feet
- c.) all required Range Safety instrumentation is functioning properly
- d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A "Good Sense Rule" is in effect for launch which states:

"Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY FLIGHT RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTL), landings at the Trans-Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). These forecasts are prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston and briefed by them to the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTL with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required. For TAL sites, cloud coverage 4/8 or less below 5,000 feet and a visibility of 5 statute miles or greater are required.
- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability .
- For the RTL site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- An RTL rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:
 - a.) The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels within and below the clouds.
 - b.) Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading alignment circles are clear of showers.
 - c.) The movement of the showers is observed to be consistent and no additional convective development is forecast.

d.) Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a.) above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.
- **Headwind:** not to exceed 25 knots.
- **Tailwind:** not to exceed 10 knots average, 15 knots peak.
- **Turbulence:** conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

The end of mission landing weather forecast is prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston for the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions. Decision time for the deorbit burn is 70 - 90 minutes before landing. The weather criteria are:

- Cloud coverage of 4/8 or less below 8,000 feet and a visibility of 5 miles or greater required.
- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 20 days the limit is 12 knots, day and night.
- Headwind cannot exceed 25 knots.
- Tailwind cannot exceed 10 knots average, 15 knots peak.
- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.
- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.
- Turbulence must be less than or equal to moderate intensity.
- Consideration may be given for landing with a "no go" observation and a "go" forecast if at decision time analysis clearly indicates a continuing trend of improving weather conditions, and the forecast states that all weather criteria will be met at landing time.

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

-Radar: Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radar sites. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.

-Field Mill Network: Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.

-Lightning Detection System: Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of strikes are color coded according to time of occurrence.

-Lightning Detection And Ranging (LDAR): Developed by NASA at the Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.

-National Lightning Detection Network: Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.

-Rawinsonde: A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.

-Jimsphere balloon: A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.

-Doppler Radar Wind Profiler: Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another Jimsphere balloon is released.

-Rocketsonde: A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and 370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.

-Satellite Images and Data: Provided directly to the satellite terminal at USAF Range Weather Operations and NOAA National Weather Service Space Flight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.

-Meteorological Interactive Data Display System (MIDDS): Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.

-Towers: 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short-term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.

-Buoys: Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground

processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.

-Solid Rocket Booster Retrieval Ships: These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.

-Weather Reconnaissance Aircraft: A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

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JOHN F. KENNEDY SPACE CENTER

October 27, 1998



KSC Contact: Bruce Buckingham

KSC Release No. 131-98

KSC BUSINESS EXPO '98 SET FOR NOV. 4

Kennedy Space Center's Small Business Council, along with the 45th Space Wing and the Canaveral Port Authority, extend an invitation to all firms to attend the 9th Annual Business Opportunities Expo on Wednesday, Nov. 4, at Port Canaveral Cruise Terminal 10.

More than 200 exhibitors, 19 of which provide recycled products, will assemble to display their products and services for buyers, engineers, and the general public. A variety of expertise will be displayed ranging from computer technology, printed circuit board design, electrical supplies, cryogenic valves, safety products, and much more.

The Expo will offer a chance for business representatives to network with purchasing departments from the new joint base operations support contractor, Space Gateway Support (SGS). Also on hand will be representatives from NASA, the 45th Space Wing, United Space Alliance, Boeing, Lockheed Martin Aerospace, Dynacs, Computer Sciences Raytheon, Severdrup, Space Mark, and Baker Support Services.

New to this year's agenda are two workshops: "Environmental Requirements Regarding Federal Subcontracting" (10 a.m.) and "Doing Business with the 45th Space Wing" (1 p.m.).

The Expo will be open from 9 a.m. to 3 p.m. at Cruise Terminal 10. Admission is free.

For more information, please call the NASA Central Industry Assistance Office at (407)867-7353.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

Oct. 30, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 132-98



NASA SELECTS MARYLAND FIRM TO PROVIDE INFORMATION TECHNOLOGY SERVICES FOR FOUR NASA FIELD CENTERS

NASA has selected OAO Corporation of Greenbelt, Md., to provide information technology services for the four Office of Space Flight centers under the Outsourcing Desktop Initiative for NASA (ODIN).

The services will be ordered under the existing ODIN master contract, which is administered by the ODIN Program Office at NASA's Goddard Space Flight Center in Maryland. They include comprehensive desktop computer, server, local area network, telephone, local video, administrative radio, remote communication and public address services.

Kennedy Space Center (KSC) is the lead service center for the Office of Space Flight ODIN delivery orders, which covers four NASA centers. Besides KSC, they are Johnson Space Center (JSC) in Texas; Marshall Space Flight Center (MSFC) in Alabama; and Stennis Space Center (SSC) in Mississippi.

There will be four firm fixed-priced delivery orders, one for each Office of Space Flight center. The period of performance is approximately three years beginning on Dec. 1, 1998, at KSC; Jan. 1, 1999, at JSC; Feb. 1, 1999, at SSC; and May 1, 1999, at MSFC. Each of the delivery orders will expire concurrently on Nov. 30, 2001.

The total value for the four delivery orders is estimated at \$154.9 million. The breakdown by center is \$76.7 million for JSC; \$41.7 million for MSFC; \$21 million for KSC; and \$15.5 million for SSC.

Six other firms are part of the pool of information technology contractors, which are available for selection under the ODIN master contract. They are Boeing Information Services Inc., Vienna, Va.; Computer Sciences Corporation, Laurel, Md.; DynCorp TECHSERV, LLC, Reston, Va.; FDC Technologies, Bethesda, Md.; RMS Information Systems Inc., Lanham, Md.; and Wang Government Systems Inc., McLean, Va.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 30, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 133-98



Note to Editors:

MEDIA INVITED TO STS-95 HUBBLE EXPERIMENT CONTROL CENTER AT KSC

Members of the media may schedule visits to the STS-95 Payload Operations Control Center (POCC) for the Hubble Space Telescope Orbital Systems Test (HOST), where they can watch engineers command and monitor the HOST experiments.

HOST's purpose is to validate components planned for installation on Hubble Space Telescope and to evaluate new technologies in the microgravity and radiation of space. The experiments include a microprocessor that will serve as the new brain on Hubble and a state-of-the art cryogenic cooling system that may be fitted on the space telescope in 2000.

Located at the Mission Operations Support Building (MOSB) at Kennedy Space Center, the HOST POCC is available to media from Monday, Nov. 2 through Friday, Nov. 6 from 9 a.m. - 3 p.m. To schedule a tour of the facility, please contact Manny Virata in the KSC Public Affairs Office at (407) 867-7819.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

November 3, 1998

KSC Contact: Joel Wells

KSC Release No. 136-98



Note to Editors:

MEDIA OPPORTUNITY NOV. 5 AT LAUNCH PAD 39A WITH STS-88 ASTRONAUTS

The six-member crew of the first Shuttle mission slated for International Space Station (ISS) assembly will be at Kennedy Space Center this week for the STS-88 Terminal Countdown Demonstration Test (TCDT). Media representatives will have an opportunity to meet the crew on Nov. 5 at Launch Pad 39A, where Shuttle Endeavour and the Unity connecting module await a Dec. 3 target launch date.

The countdown test is held prior to each Space Shuttle flight. It provides the crew of each mission opportunities to participate in simulated countdown activities at KSC. The time is also used by the crew for emergency egress training exercises at the pad and inspecting their mission payloads in the orbiter's payload bay.

Today at about 6:30 p.m., the crew is scheduled to arrive at KSC's Shuttle Landing Facility. NASA photographers and videographers will capture this event and images will be available to the media Wednesday at the KSC Press Site.

On Thursday, the crew will speak informally to interested media just prior to their scheduled emergency egress walk-down of the launch pad area. Media interested in participating in this photo opportunity and question and answer session should be at the KSC Press Site by 12:30 p.m. on Thursday for transport to the pad. This event will not be carried live on NASA TV, but will be replayed at 3:30 p.m. that same day.

On Friday at about 7:45 a.m., the astronauts will depart KSC's crew quarters wearing their launch and entry suits headed for Pad 39A. At about 8:15 a.m. they will begin ingress into Shuttle Endeavour's crew compartment. The prelaunch dress rehearsal will culminate in a simulated main engine cut-off at about 11 a.m. The crew is scheduled to depart KSC for their homes in Houston, TX, Friday at about 2 p.m.

PHOTO EVENTS OPEN TO MEDIA: Wednesday at 10:30 a.m. crew members will drive the M113 tracked vehicle. Thursday at 1:30 p.m. the media will have a brief Q&A session with the crew. Friday at 7:45 a.m. the crew walks out of the O&C Building headed for the pad. Media interested in these events must report to the KSC Press Site one hour prior to each event. Media needing credentials must call the KSC Press Site at 407-867-2468.

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

November 4, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 137-98

Note to Editors: TCDT MEDIA OPPORTUNITY WITH STS-88 CREW RESCHEDULED

A press conference featuring members of the STS-88 crew, who are at KSC this week for the Terminal Countdown Demonstration Test (TCDT), has been rescheduled for Thursday, Nov. 5, in the KSC Press Site auditorium. The event will begin at 6:30 p.m. EST and last no more than 30 minutes.

Media at KSC who wish to participate will be permitted to ask questions and photograph all six members of the crew of Endeavour, currently targeted for launch Dec. 3, 1998.

This session is usually conducted during TCDT activities at the launch pad, however, forecasts for inclement weather Thursday caused the event to be rescheduled for later in the day and to be held indoors.

The press conference will be carried live on NASA TV. Questions will be permitted from media located at other NASA centers.

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JOHN F. KENNEDY SPACE CENTER

November 6, 1998



KSC Contact: Bruce Buckingham

KSC Release No. 138-98 (Rev. A)

Note to Editors: (Revised)

DISCOVERY SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-95

The orbiter Discovery is scheduled to land at Kennedy Space Center on Saturday, Nov. 7 at 12:04 p.m. EST completing its nine-day STS-95 mission which was launched from KSC on Oct. 29.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 135 at mission elapsed time 8 days, 21 hours, 44 minutes. Deorbit burn will occur at about 10:53 a.m. Saturday.

The two KSC landing opportunities on Saturday are: 12:04 p.m. and 1:45 p.m. EST.

Managers have decided to call up the back-up landing location at Edwards Air Force Base (EAFB), CA, for a possible landing on Saturday. This is due to weather concerns on both coasts Sunday. The two EAFB landing opportunities on Saturday are: 1:35 p.m. and 3:17 p.m. EST.

If managers must keep Discovery in orbit an additional day, three landing opportunities are available on Sunday at KSC and two at EAFB.

KSC Sunday landing times are: 10:17 a.m., 11:58 a.m. and 1:39 p.m. EST.

EAFB Sunday landing times are: 11:49 a.m. and 1:30 p.m. EST.

This landing of Discovery will mark the 45th landing at KSC in the history of Space Shuttle flight. It will be the 16th consecutive landing at KSC and the 23rd in the last 24 shuttle flights. Discovery is currently on the 92nd Space Shuttle mission in the history of the program.

Following landing, select members of the crew are scheduled to participate in a press conference at the KSC Press Site auditorium. The event will be carried live on NASA TV beginning at about 6 p.m. On the day following landing, the entire crew will depart for Houston, TX, at about 10 a.m. SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV)

will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Discovery Oct. 29. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC Sunday morning.

If Discovery lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

About 7-8 hours after Discovery lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 1 for post-flight deservicing. Operations in the OPF will be made to prepare Discovery for its next Space Shuttle mission, STS-96, currently targeted for launch in May.

-- end --

NOTICE TO EDITORS: The KSC press site will be open Friday, Nov. 6, from 7 a.m. - round-the-clock - to 3 a.m. Sunday, Nov. 8. Media wishing to view Discovery's landing should be at the KSC press site prior to 10:30 a.m. Saturday for transport to the SLF. Due to safety limits, media must be signed-up in advance to view the landing from the SLF media viewing site. Accreditation must be arranged in advance. On the day following landing, Sunday, Nov. 8, the office will be open again from 7 a.m. - 3 p.m. to support the crew departure photo opportunity. Media wishing to view crew departure should be at the KSC Press Site by 8:30 a.m. for transport to the Cape Canaveral Air Station skid strip.

Additional specific information regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours is available at the KSC News Center. Recorded status of KSC Space Shuttle launch and landing operations can be reached by calling 407-867-2525.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

November 12, 1998

KSC Contact: George H. Diller

KSC Release No. 140-98



STARDUST ARRIVES AT KSC FOR LAUNCH PREPARATIONS

NASA's Stardust spacecraft, designed to fly through a comet's coma, the cloud that surrounds the nucleus of a comet, has arrived at the Kennedy Space Center to begin prelaunch processing. Launch aboard a Boeing Delta 7426 rocket is currently targeted for Feb. 6, 1999 from Complex 17, Cape Canaveral Air Station.

Stardust will be the first spacecraft ever to bring cometary material back to Earth for analysis by scientists worldwide. Comets are believed to contain the original building blocks of the planets and perhaps of life itself. Early in Earth's history, comets laden with water ice slammed into the planet, maybe providing the source of our oceans. When Stardust returns its pristine comet samples, scientists will be able to examine for the first time the key ingredients of the original recipe that created the planets.

Stardust is to collect particles flying off the nucleus of comet Wild 2 in January, 2004. It will also bring back samples of interstellar dust including the recently discovered dust streaming into the solar system from other stars. The spacecraft will send back pictures of Wild 2, count the bullet-like comet particles striking the spacecraft, and produce real-time analyses of the composition of the material coming off the comet. A unique substance called aerogel is the medium that will be used to catch and preserve comet samples. When Stardust swings by Earth in January 2006, the samples encased in a re-entry capsule will be jettisoned and parachute to a pre-selected site in the Utah desert.

The length of the Stardust main bus is 5.5 feet (1.7 meters), about the size of an average office desk. The spacecraft weighs 849 pounds (385 kilograms). It is being processed in NASA's Payload Hazardous Servicing Facility (PHSF) located in the KSC Industrial Area. Among the processing activities to be performed are installation and testing of the solar arrays, final installation and testing of some spacecraft instruments followed by an overall spacecraft functional test. The spacecraft can then be fueled and mated to the Star 37 solid propellant upper stage booster.

Meanwhile, at Complex 17, the Delta II rocket will be undergoing erection and prelaunch checkout by Boeing. The first stage is scheduled to be installed into the launcher on Jan. 5, 1999. Four solid rocket boosters will be attached around the base of the first stage the next day. The second stage will be mated atop the first stage on Jan. 8, and the spacecraft fairing will be hoisted into the cleanroom of the pad's mobile service tower Jan. 11.

Stardust will be transported to Complex 17 on Jan. 28 for hoisting aboard the Delta rocket on Pad A and mating to the second stage. After the spacecraft undergoes state of health checks, the fairing can be placed around it three days later. Launch is currently targeted for

Feb. 6 at 4:08 p.m. EST. The 20-day launch opportunity ends Feb. 25.

Stardust is built by Lockheed Martin Astronautics, Denver, Co., under a NASA contract managed by Jet Propulsion Laboratory, Pasadena, Ca. It is the fourth NASA Discovery mission to be chosen following Mars Pathfinder, the Near Earth Asteroid Rendezvous (NEAR), and the Lunar Prospector. The goal of NASA's Discovery Program is to launch many smaller missions with shorter development time that perform focused science at lower cost.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

November 16, 1998

KSC Contact: George H. Diller

KSC Release No. 141-98



U.S. LABORATORY MODULE ARRIVES AT KENNEDY SPACE CENTER

The U.S. Laboratory module, considered the centerpiece of the International Space Station, arrived today at the Kennedy Space Center. Targeted for launch aboard the Shuttle Endeavour in February 2000, the module will undergo final pre-launch preparations at KSC's Space Station Processing Facility.

NASA's "Super Guppy" aircraft transported the module to Kennedy's Shuttle runway from the Marshall Space Flight Center, in Huntsville, AL, where it was built.

Serving as a world-class, state-of-the-art research facility in a near zero-gravity environment, the lab will provide astronauts a shirtsleeve environment for research in many areas including life science, microgravity science, Earth science and space science. The facilities inside the lab are designed to yield a steady stream of findings from hundreds of high-quality science and technology experiments. It is the primary astronaut workstation for the United States involvement on the International Space Station.

The laboratory module is 28 feet in length, 14 feet in diameter, and weighs 32,000 pounds. Comprising it are three cylindrical sections with two end cones. Each end-cone contains a hatch opening through which the astronauts will enter and exit the lab.

The exterior of the module is made of aluminum and features a waffle pattern that strengthens the hull. It will be covered with an insulation blanket to protect the module from the harsh temperatures of outer space. Next, an intermediate debris shield, made of material similar to that of bulletproof vests, will protect the module against space debris and micrometeoroids. Finally, an aluminum debris shield will then be placed over the intermediate debris shield for added protection and to reflect the intense sunlight, reducing the load on the air conditioning system.

Inside, four "stand-off" structures provide space for power lines, data management systems, vacuum systems, air conditioning ducts, and water lines, all supporting the space station's racks. There are 24 racks inside the laboratory module, six on each side. Of these, 13 are scientific racks dedicated to various science experiments; 11 are systems racks which will provide power, cooling water and environmental control.

A single, 20-inch round window is located on one side of the lab near the center. It is made of the highest-quality optical glass ever and provides a remarkable vantage-point to observe the Earth from the International Space Station.

The Boeing Company built the U.S. Laboratory module, like the other U.S. modules for the International Space Station, at NASA's Marshall Space Flight Center in Huntsville,

AL. It is planned to be taken into space for mating to the other International Space Station elements on Station flight designated as "5A."

NOTE TO EDITORS: Those media wishing an early glimpse of the U.S. Laboratory will be taken to the Space Station Processing Facility for an informal photo opportunity on Thursday, Nov. 19. Media wishing to participate should be at the NASA-KSC News Center at 9 a.m. Spokespersons from NASA and Boeing will be available to answer questions.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

November 25, 1998

KSC Contact: George Diller

KSC Release No. 142-98



Note to Editors/News Directors:

SWAS SPACECRAFT TO BE LAUNCHED ABOARD PEGASUS XL DEC. 2

NASA's Submillimeter Wave Astronomy Satellite (SWAS) spacecraft aboard an Orbital Sciences Pegasus XL vehicle is scheduled for launch on Wednesday, Dec. 2, during a window which extends from 4:50 p.m. to 6:14 p.m. PST. The drop of the Pegasus from the L-1011 aircraft is targeted to occur within this launch window at 5:40 p.m. PST at a location over the Pacific Ocean approximately 100 miles offshore from Vandenberg Air Force Base, Calif.

The 625-pound SWAS spacecraft's mission is designed to help scientists gain a greater understanding of star formation by determining the composition of interstellar clouds, and establishing the means by which these clouds cool as they collapse to form stars and planets. During the two-year mission, the spacecraft will observe hundreds of regions of ongoing star formation within our galaxy. SWAS will be placed into a 370-mile polar orbit circling the Earth every 97 minutes. SWAS is one of NASA's Small Explorers (SMEX) designed and built by Goddard Space Flight Center, Greenbelt, Md. The launch program and countdown management for Pegasus/SWAS is directed by the Kennedy Space Center.

The prelaunch news conference is scheduled to occur on Tuesday, Dec. 1, at 12 p.m. (noon) PST in the conference room of the NASA-KSC Resident Office at Vandenberg Air Force Base. The news conference will be carried on an audio-only basis using the "V" circuits.

Participating in the prelaunch news conference will be:

- Ray Lugo, NASA Launch Manager,
Kennedy Space Center
- J.R. Thompson, Executive Vice President and General Manager
Launch Systems Group, Orbital Sciences Corporation
- Jim Watzin, SWAS Mission Director/Manager, Small Explorer Project
Goddard Space Flight Center
- Dr. Gary Melnick, SWAS Principle Investigator
Smithsonian Astrophysical Observatory, Cambridge, Mass.
- Captain Joe Kurtz, Launch Weather Officer
USAF 30th Weather Squadron, Vandenberg Air Force Base

Media desiring to cover the prelaunch news conference and mission science briefing should meet at the south gate of Vandenberg Air Force Base on California State Road 246 at 11:45 a.m. on Tuesday, Dec. 1 for escort to the NASA-KSC Vandenberg Resident Office.

ACCREDITATION

Media desiring accreditation information should contact the Air Force at:

Public Affairs Office
Vandenberg Air Force Base
Telephone: 805/734-8232, Ext. 6-3595
FAX: 805/734-8232, Ext. 6-8303
E-mail: pubaffairs@plans.vafb.af.mil

LAUNCH DAY PRESS COVERAGE

On launch day, media representatives should meet at the Vandenberg main gate at 4:15 p.m. to be escorted to the runway for the takeoff of the L-1011, scheduled to occur at 4:40 p.m. After departure, media will be taken to the viewing room of the NASA Mission Director's Center located at Building 840 on South Vandenberg Air Force Base. From there, media may follow the release and launch of Pegasus/SWAS.

Assuming a nominal flight of the Pegasus launch vehicle, a post-launch news conference will not be held. However, launch vehicle and spacecraft representatives will be available afterward to informally answer questions from the media.

NASA TELEVISION AND V CIRCUIT COVERAGE OF PEGASUS/SWAS

The prelaunch news conference will be held at 3 p.m. EST on Tuesday, Dec. 1 and carried on the "V" audio circuits which may be dialed at Area Code (407) 867-1220, 867-1240, 867-1260, 867- 4003, 867-7135, and 867- 4920. The prelaunch news conference will not be carried on NASA Television.

Launch highlights will be replayed on the NASA Television Video File at 12 p.m. and also tentatively at 3 p.m. EST on Thursday, Dec. 3. NASA TV is on GE-2, Transponder 9C located at 85 degrees West longitude.

PEGASUS/SWAS NEWS CENTER

The Pegasus/SWAS News Center at the NASA-KSC Vandenberg Resident Office will be staffed starting Tuesday, Dec. 1 and may be reached between 8 a.m. and 4:30 p.m. PST at 805/734-8232, Ext. 5-3051 or Ext. 5-3001. A recorded status report will also be available starting at that time and may be reached by dialing 805/734-2693.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

November 24, 1998

KSC Contact: Joel Wells

KSC Release No. 143-98



FIRST U.S. STATION ELEMENT TO BE LAUNCHED DEC. 3 ON MISSION STS-88

NASA program managers today set Dec. 3 as the official launch date for the STS-88 mission aboard Space Shuttle Endeavour. This is the first Shuttle mission dedicated to the assembly of the International Space Station (ISS), the largest and most complex international cooperative science and engineering venture in history.

The six-member flight crew will work to mate Endeavour's primary payload, the U.S.-made Unity connecting module, to the Russian-built Zarya control module during the 12-day mission. Zarya was launched on a Proton rocket from Baikonur Cosmodrome in Kazakstan, Russia on Nov. 20. While the STS-88 Flight Readiness Review was in progress, Russian flight controllers performed tests on Zarya's onboard systems and adjusted its orbital altitude.

The Flight Readiness Review, held at Kennedy Space Center, FL, began yesterday afternoon allowing all Shuttle and ISS project offices to evaluate the flight readiness of the astronaut crew, vehicle and cargo, along with the launch and mission control teams.

"Following Zarya's successful launch last week, it is now NASA's responsibility to begin the International Space Station assembly process," said Johnson Space Center Director George Abbey. "This flight will clearly demonstrate the unique capabilities of the Space Shuttle, and of astronauts and cosmonauts to assemble large structures in space. STS-88 will showcase the Shuttle as the safe and reliable workhorse of the space station era and other future activities in earth orbit."

Endeavour is scheduled for launch Dec. 3 at about 3:59 a.m. EST from Launch Pad 39A. The exact launch time will be determined during the final hour of the launch countdown as mission controllers pinpoint Zarya's exact orbital position. The mission is slated to last 11 days, 19 hours and 49 minutes. An on-time launch will lead to a Kennedy Space Center landing on Monday, Dec. 14 at 11:48 p.m. EST.

The STS-88 Mission Commander is Robert Cabana. The pilot is Fredrick Sturckow. Nancy Currie, Jerry Ross, James Newman and Russian cosmonaut Sergei Krikalev will serve as mission specialists on this flight.

STS-88 will be the 13th flight of Shuttle Endeavour and the 93rd mission in Shuttle program history.



JOHN F. KENNEDY SPACE CENTER

November 24, 1998

KSC Contact: Joel Wells

KSC Release No. 144-98



STS-88 LAUNCH COUNTDOWN SET TO BEGIN NOV. 30

NASA will begin the countdown for launch of Space Shuttle Endeavour on mission STS-88 on Nov. 30, at 7 a.m. EST at the T-43 hour mark. The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center.

The countdown includes 25 hours and 59 minutes of built-in hold time leading to a preferred launch time at about 3:59 a.m. on Dec. 3. The launch window opens at 3:54 p.m. and closes at 4:04 a.m. An exact launch time will be determined during the T-9 minute hold after managers evaluate the orbital position of the Zarya control module. Zarya was launched from Russia Nov. 20.

This will be the fifth and final Space Shuttle mission of the year. Mission STS-88 will mark the 13th flight of the orbiter Endeavour and the 93rd flight overall in NASA's Space Shuttle program. STS-88 is slated to last 11 days, 19 hours, 49 minutes. Endeavour is scheduled to land at KSC at 11:48 p.m. on Dec. 14.

The six-member astronaut team will serve as a construction crew for the first International Space Station assembly mission. The primary objective of this mission is to mate the U.S.-made connecting module and its two pressurized mating adapters to the Russian-built Zarya control module. Unity will serve as a passageway between the living and working areas of the space station.

Shuttle orbiter Endeavour was rolled out of Kennedy Space Center's Orbiter Processing Facility bay 1 on Oct. 15 and then mated with the external tank and solid rocket boosters in the Vehicle Assembly Building. The Shuttle stack was transported to Pad 39A on Oct. 21.

The STS-88 crew consists of: Commander Robert Cabana, Pilot Fredrick Sturckow, Mission Specialists Nancy Currie, Jerry Ross, James Newman and Russian Cosmonaut Sergei Krikalev.

The crew is scheduled to arrive at KSC at about 11:30 p.m., Sunday, Nov. 29. Their activities at KSC prior to launch will include crew equipment fit checks, medical examinations and opportunities to fly in the Shuttle Training Aircraft.

(end of general release)

COUNTDOWN MILESTONES

*all times are Eastern

Launch - 3 Days (Monday, Nov. 30)

- Prepare to start the STS-88 launch countdown
- Perform the call-to-stations (6:30 a.m.)
- All members of the launch team report to their respective consoles in Firing Room 3 in the Launch Control

Center for the start of the countdown

- Countdown begins at the T-43 hour mark (7 a.m.)
- Begin final vehicle and facility close-outs for launch
- Review flight software stored in mass memory units and display systems
- Load backup flight system software into Endeavour's general purpose computers
- Payload closeouts complete
- Activate and test navigational systems
- Close payload bay doors (8 p.m.)
- Complete preparations to load power reactant storage and distribution system (10 p.m.)

Enter first planned built-in hold at T-27 hours for duration of four hours (11 p.m.)

Launch - 2 Days (Tuesday, Dec. 1)

- Clear launch pad of all non-essential personnel
- Perform test of the vehicle's pyrotechnic initiator controllers (12 midnight)
- Open launch pad to personnel supporting PRSD load

Resume countdown (3 a.m.)

- Begin operations to load cryogenic reactants into Endeavour's fuel cell storage tanks (3 a.m. - 11 a.m.)

Enter four-hour built-in hold at T-19 hours (11 a.m.)

- Resume orbiter and ground support equipment close-outs

Resume countdown (3 p.m.)

- Demate orbiter mid-body umbilical unit and retract into fixed service structure
- Start final preparations of the Shuttle's three main engines for main propellant tanking and flight
- Close-out the tail service masts on the mobile launcher platform
- Install Mission Specialist seats
- Fill sound suppression water tank

Enter planned hold at T-11 hours for 13 hours, 9 minutes (11 p.m.)

- Activate the orbiter's guidance and navigation computer (11:30 p.m.)
- Begin startracker functional checks

Launch - 1 Day (Wednesday, Dec. 2)

- Activate orbiter's inertial measurement units
- Install film in numerous cameras on the launch pad
- Activate the orbiter's communications systems (2:30 a.m.)
- Safety personnel conduct debris walk down
- Flight crew equipment late stow begins (6 a.m.)
- Move Rotating Service Structure (RSS) to the park position (8 a.m.)
- Perform orbiter ascent switch list in crew cabin

Resume countdown (12:09 p.m.)

- Start fuel cell flow-through purge
- Activate the orbiter's fuel cells (1:15 p.m.)
- Clear the blast danger area of all non-essential personnel
- Configure communications at Mission Control, Houston, for launch

- Switch Endeavour's purge air to gaseous nitrogen
- Complete inertial measurement unit activation (4:20 p.m.)

Enter planned two-hour built-in hold at the T-6 hour mark (5:09 p.m.)

- Launch team verifies no violations of launch commit criteria prior to cryogenic loading of the external tank
- Clear pad of all personnel

Resume countdown (7:09 p.m.)

- Begin loading the external tank with about 500,000 gallons of cryogenic propellants (about 6:40 p.m.)
- Complete filling the external tank with its flight load of liquid hydrogen and liquid oxygen propellants (about 9:40 p.m.)

Enter planned two-hour built-in hold at T-3 hours (10:09 p.m.)

- Perform inertial measurement unit preflight calibration
- Align Merritt Island Launch Area (MILA) tracking antennas
- Close-out crew and Final Inspection Team proceed to Launch Pad 39A (9:50 p.m.)

Launch Day (Thursday, Dec. 3)

Resume countdown at T-3 hours (12:09 a.m.)

- Perform open loop test with Eastern Range
- Crew departs Operations and Checkout Building for the pad (about 12:09 a.m.)
- Complete close-out preparations in the white room
- Check cockpit switch configurations
- Flight crew begins entry into the orbiter (about 12:39 a.m.)
- Astronauts perform air-to-ground voice checks with Launch Control and Mission Control
- Close Endeavour's crew hatch (about 1:54 a.m.)
- Perform hatch seal and cabin leak checks
- Complete white room close-out
- Primary ascent guidance data is transferred to the backup flight system

Enter planned 10-minute hold at T-20 minutes (2:49 a.m.)

- Close-out crew moves to fallback area (about 2:49 a.m.)
- NASA Test Director conducts final launch team briefings
- Complete inertial measurement unit pre-flight alignments

Resume countdown (2:59 a.m.)

- Transition the orbiter's onboard computers to launch configuration
- Start fuel cell thermal conditioning
- Close orbiter cabin vent valves
- Transition backup flight system to launch configuration

Enter planned 40-minute hold at T-9 minutes (3:10 a.m.)

- Launch Director, Mission Management Team and NASA Test Director conduct final polls for go/no go to launch

Resume countdown at T-9 minutes (3:50 a.m.)

- Start automatic ground launch sequencer (T-9:00 minutes)

- Retract orbiter crew access arm (T-7:30)
- Start mission recorders (T-6:15)
- Start Auxiliary Power Units (T-5:00)
- Arm SRB and ET range safety safe and arm devices (T-5:00)
- Start liquid oxygen drainback (T-4:55)
- Start orbiter aerosurface profile test (T-3:55)
- Start main engine gimbal profile test (T-3:30)
- Pressurize liquid oxygen tank (T-2:55)
- Begin retraction of the gaseous oxygen vent arm (T-2:55)
- Fuel cells to internal reactants (T-2:35)
- Pressurize liquid hydrogen tank (T-1:57)
- Deactivate SRB joint heaters (T-1:00)
- Orbiter transfers from ground to internal power (T-0:50 seconds)
- Ground Launch Sequencer go for auto sequence start (T-0:31 seconds)
- SRB gimbal profile (T-0:21 seconds)
- Ignition of three Space Shuttle main engines (T-0:6.6 seconds)
- SRB ignition and liftoff (T-0)

SUMMARY OF BUILT-IN HOLDS FOR STS-88

T-TIME	LENGTH OF HOLD	HOLD BEGINS	HOLD ENDS
T-27 hours	4 hours	11 p.m. Mon.	3 a.m. Tues.
T-19 hours	4 hours	11 a.m. Tues.	3 p.m. Tues.
T-11 hours	13 hours, 9 minutes	11 p.m. Tues.	12:09 p.m. Wed.
T-6 hours	2 hours	5:09 p.m. Wed.	7:09 p.m. Wed.
T-3 hours	2 hours	10:09 p.m. Wed.	12:09 a.m. Thurs.
T-20 minutes	10 minutes	2:49 a.m. Thurs.	2:59 a.m. Thurs.
T-9 minutes	40 minutes	3:10 a.m. Thurs.	3:50 a.m. Thurs.

MISSION STS-88 CREW

Commander (CDR): Robert Cabana
 Pilot (PLT): Fredrick Sturckow
 Mission Specialist (MS1): Jerry Ross
 Mission Specialist (MS2): Nancy Currie
 Mission Specialist (MS3): Jim Newman
 Mission Specialist (MS4): Sergei Krikalev

SUMMARY OF STS-88 LAUNCH DAY CREW ACTIVITIES

December 2

3:30 p.m. Wake up
 4:00 p.m. Breakfast
 8:00 p.m. Lunch
 *10:59 p.m. Snack/crew photo
 11:29 p.m. Weather briefing (CDR, PLT, MS2)
 *11:29 p.m. Crew don launch and entry suits (MS1, 3 and 4)
 *11:39 p.m. Crew don launch and entry suits (CDR, PLT, MS2)

December 3

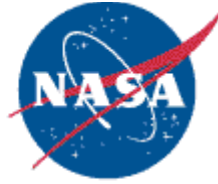
*12:09 a.m. Depart for Launch Pad 39A
 *12:39 a.m. Arrive at white room and begin ingress

* 1:54 a.m. Close crew hatch
* 3:59 a.m. Launch

**Televised events (times may vary slightly)*

All times Eastern

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

November 25, 1998

KSC Contact: George H. Diller

KSC Release No. 146-98



LEONARDO MPLM TRANSFER CEREMONY TO BE HELD AT KSC DEC. 3

NASA Administrator Daniel Goldin and the President of the Italian Space Agency, Sergio De Julio, will meet at the Kennedy Space Center on Thursday, Dec. 3 for a ceremonial event transferring the "Leonardo" Multipurpose Logistics Module (MPLM) from the Agenzia Spaziale Italiana (ASI) to NASA.

The MPLM, a reusable logistics carrier, will be the primary delivery system used to resupply and return station cargo requiring a pressurized environment. It is one of Italy's major contributions to the International Space Station Program. The cylindrical module is approximately 21 feet long and 15 feet in diameter, weighting almost 4.5 tons excluding its capability to hold up to 20,000 pounds of contents. Launched in the Space Shuttle's payload bay, it will be docked to the International Space Station once on orbit. It will transport supplies, science experiments, spare parts and other logistical components to the International Space Station.

A ceremonial signing of a document signifying the transfer of Leonardo, the first of three MPLM carriers, is to be held at the International Space Station Center located adjacent to the Space Station Processing Facility. This activity will begin at 5:45 a.m. following the STS-88 launch on Thursday, Dec. 3. Participating in the ceremony will be:

- Daniel S. Goldin, NASA Administrator
- Sergio De Julio, President, Italian Space Agency
- Roy D. Bridges, Director, NASA Kennedy Space Center

After the ceremony, media will be escorted to the Space Station Processing Facility to see Leonardo and for a photo/interview opportunity. Available will be:

- Daniel Goldin, NASA Administrator
- Sergio De Julio, President, Italian Space Agency
- Roy D. Bridges, Director, Kennedy Space Center
- Joseph H. Rothenberg, NASA Associate Administrator for Space Flight
- Gretchen McClain, NASA Deputy Associate Administrator, Space Development
- Randy Brinkley, NASA International Space Station Program Manager
- John D. Schumacher, NASA Associate Administrator for External Relations
- Giovanni Rum, Advisor to the ASI President
- Silvana Rabbia, ASI MPLM Program Manager
- Giuseppe Viriglio, Head, Alenia Aerospazio Space Division
- Saverio Liroy, Head, Alenia Space Infrastructure Program
- Doug Stone, Boeing Program Manager for International Space Station

Italian astronaut Umberto Guidoni will also be present.

Media should be at the KSC Press Site at 5 a.m. for transportation to the International Space Station Center. Since media will later be taken inside the high bay of the Space Station Processing Facility, long pants and closed-toe shoes are required. No shorts or sandals can be allowed. Also, no food, tobacco, lighters, matches, knives or graphite pencils can be permitted inside the high bay.

STS-88 mission badges will be used for this event. Those media needing accreditation should contact the NASA News Center at KSC at 407/867-2468.

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JOHN F. KENNEDY SPACE CENTER

November 25, 1998

KSC Contact: George Diller

KSC Release No. 147-98



Note to Editors/News Directors:

NAME FOR U.S. LABORATORY TO BE UNVEILED AT KSC MEDIA EVENT ON DEC. 1

The U.S. Laboratory module, considered the centerpiece of the International Space Station, will have its official name unveiled at a media event to be held in the KSC Space Station Processing Facility on Tuesday, Dec. 1. The unveiling and brief remarks will occur in front of the module. The U.S. Laboratory is planned for launch aboard Space Shuttle Endeavour on the sixth International Space Station construction flight currently targeted to occur in Feb. 2000.

Participating in the unveiling will be Roy D. Bridges, Director, Kennedy Space Center, and Randy Brinkley, Program Manager, International Space Station, Johnson Space Center. Astronauts from the STS-98 flight crew participating will include Ken Cockrell, Commander; Mark Polansky, Pilot; and Marsha Ivins, Mission Specialist. Other crew members may also attend.

Departure for media representatives from the KSC Press Site to the Space Station Processing Facility will occur at 11:15 a.m. on Tuesday, Dec. 1. Since media will be taken inside the high bay, long pants and closed-toe shoes are required. No shorts are allowed. Also, no food, tobacco, lighters, matches, knives or graphite pencils can be permitted inside the high bay. Media will be returned to the KSC Press Site by 1:15 p.m.

STS-88 mission badges will be used for this event. Those needing accreditation should contact the KSC News Center at 407/867-2468 by the close of business on Monday, Nov. 30.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 1, 1998

KSC Contact: George H. Diller

KSC Release No. 152-98

SPACE SHUTTLE WEATHER LAUNCH COMMIT CRITERIA AND KSC END OF MISSION WEATHER LANDING CRITERIA

The launch weather guidelines involving the Space Shuttle and expendable rockets are similar in many areas, but a distinction is made for the individual characteristics of each. The criteria are broadly conservative and assure avoidance of possibly adverse conditions. They are reviewed for each launch.

For the Space Shuttle, weather "outlooks" provided by the U. S. Air Force Range Weather Operations Facility at Cape Canaveral begin at Launch minus 5 days in coordination with the NOAA National Weather Service Spaceflight Meteorology Group (SMG) at the Johnson Space Center in Houston. These include weather trends and their possible effects on launch day. A formal prelaunch weather briefing is held on Launch minus 1 day which is a specific weather briefing for all areas of Space Shuttle launch operations.

Launch weather forecasts, ground operations forecasts, and launch weather briefings for the Mission Management Team and the Space Shuttle Launch Director are prepared by the Range Weather Operations Facility. Forecasts which apply after launch are prepared by SMG. These include all emergency landing forecasts and the end of mission forecasts briefed by SMG to the astronauts, the Flight Director and Mission Management Team.

During the countdown, formal weather briefings occur approximately as follows:

L-24 hr 0 min: Briefing for Flight Director and astronauts

L-21 hr 0 min: Briefing for removal of Rotating Service Structure

L-9 hr 00 min: Briefing for external tank fuel loading

L-4 hr 30 min: Briefing for Space Shuttle Launch Director

L-3 hr 55 min: Briefing for astronauts

L-2 hr 10 min: Briefing for Flight Director

L-0 hr 35 min: Briefing for launch and RTLS

L-0 hr 13 min: Poll all weather constraints

The basic weather launch commit criteria on the pad at liftoff must be:

Temperature: Prior to external tank propellant loading, tanking will not begin if the 24 hour average temperature has been below 41 degrees.

After tanking begins, the countdown shall not be continued nor the Shuttle launched if:

a.) the temperature exceeds 99 degrees for more than 30 consecutive minutes.

b.) the temperature is lower than the prescribed minimum value for longer than 30 minutes unless sun angle, wind, temperature and relative humidity conditions permit recovery. The minimum temperature limit in degrees

F. is specified by the table below and is a function of the five minute average of temperature, wind and humidity. The table becomes applicable when the observed temperature reaches 48 degrees. In no case may the Space Shuttle be launched if the temperature is 35 degrees or colder.

Wind Speed	Relative Humidity				
	(kts)	0-64%	65-74%	75-79%	80-89%
0 - 1	48	47	46	45	44
2	47	46	45	44	43
3	41	41	41	40	39
4	39	39	39	39	38
5 - 7	38	38	38	38	38
8 - 14	37	37	37	37	37
>14	36	36	36	36	36

The above table can be used to determine when conditions are again acceptable for launch if parameters have been out of limits for thirty minutes or less. If longer than thirty minutes, a mathematical recovery formula of the environmental conditions is used to determine if a return to acceptable parameters has been achieved. Launch conditions have been reached if the formula reaches a positive value.

Wind: Tanking will not begin if the wind is observed or forecast to exceed 42 knots for the next three hour period.

For launch the wind constraints at the launch pad will vary slightly for each mission. The peak wind speed allowable is 30 knots. However, when the wind direction is between 100 degrees and 260 degrees, the peak speed varies for each mission and may be as low as 24 knots.

The upper atmosphere wind profile must conform to either one of two wind loading programs developed by the Johnson Space Center. This profile is determined by a series of Jimsphere wind balloon releases from Cape Canaveral Air Station. A final recommendation is made by the JSC Launch Systems Evaluation Advisory Team (LSEAT) to the KSC launch director at Launch minus 30 minutes. The Space Shuttle will not be launched within 30 minutes of the time a determination has been made that the upper wind profile will adversely affect the performance of the launch vehicle.

A downrange weather advisory shall be issued by the Shuttle Weather Officer to the Mission Management Team for their consideration if the wind in the solid rocket booster recovery area is forecast to exceed 26 knots during retrieval operations. Seas in excess of Sea State 5 (8-13 feet) may also be a factor considered by the Mission Management Team.

Precipitation: None at the launch pad or within the flight path.

Lightning (and electric fields with triggering potential):

- o Tanking will not begin if there is forecast to be greater than a 20% chance of lightning within five nautical miles of the launch pad during the first hour of tanking. The launch director with the concurrence of the safety director may make an exception after consultation with the Shuttle Weather Officer.
- o Do not launch if lightning has been detected within 10 nautical miles of the pad or the planned flight path within 30 minutes prior to launch. Launch may occur if the source of lightning has moved more than 10 nautical miles away from the pad or the flight path and a field mill, used to measure electric fields, is located within 5 nautical miles of the lightning flash.

The one-minute average of the electric field mill network may not exceed -1 or +1 kilovolt per meter within five nautical miles of the launch pad or the lightning flash at any time within 15 minutes prior to launch. This field mill criteria becomes -1.5 or + 1.5 kilovolts per meter if there are no clouds within 10 nautical miles of the flight path except those which are transparent. Also excepted are clouds with tops below the 41 degrees F. temperature level that have not have been previously associated with a thunderstorm, or associated with convective clouds having tops above the 14 degrees F. temperature level during the last three hours.

- Do not launch when lightning is observed and the cloud which produced the lightning is within 10 nautical miles of the flight path. Launch may not occur until 30 minutes has elapsed since the lightning flash, or the cloud has moved more than 10 nautical miles away.

Clouds: (types known to contain hazardous electric fields)

- Do not launch if any part of the planned flight path is through a layer of clouds any part of which is within 5 nautical miles is 4,500 feet thick or greater and the temperature of any part of the layer is between 32 degrees F. and -4 degrees F. Launch may occur if the cloud layer is a cirrus-like cloud that has never been associated with convective clouds, is located entirely at temperatures of 5 degrees F. or colder, and shows no evidence of containing water droplets.
- Do not launch through cumulus type clouds with tops higher than the 41 degree F. temperature level. Launch may occur through clouds as cold as 23 degrees F. if the cloud is not producing precipitation, and all field mills within 5 nautical miles of the flight path and at least one field mill within 2 nautical miles of the cloud center read between -100 volts per meter and +500 volts per meter.
- Do not launch 1.) through or within 5 nautical miles of the nearest edge of cumulus type clouds with tops higher than the 14 degree F level; 2) through or within 10 nautical miles of the nearest edge of cumulus clouds with tops higher than the -4 degrees F. level.
- Do not launch if the flight path is through any non-transparent clouds that extend to altitudes at or above the 32 degrees F. level which are associated with disturbed weather producing moderate or greater precipitation, or melting precipitation, within five nautical miles of the flight path.
- Do not launch through an attached anvil cloud. If lightning occurs in the anvil or the associated main cloud, do not launch within 10 nautical miles for the first 30 minutes after lightning is observed, or within 5 nautical miles from 30 minutes to 3 hours after lightning is observed.
- Do not launch if the flight path will carry the vehicle:
 - a.) through non-transparent parts of a detached anvil for the first three hours after the anvil detaches from the parent cloud, or the first four hours after the last lightning occurs in the detached anvil.
 - b.) within 10 nautical miles of non-transparent parts of a detached anvil for the first thirty minutes after the time of the last lightning in the parent or anvil cloud before detachment, or the detached anvil after its detachment.
 - c.) within 5 nautical miles of non-transparent parts of a detached anvil for the first three hours after the time of the last lightning in the parent or anvil cloud before detachment, or the detached anvil after detachment, unless there is a field mill within 5 nautical miles of the detached anvil reading less than 1,000 volts per meter for the last 15 minutes and a maximum radar returns from any part of the detached anvil within 5 nautical miles of the flight path have been less than 10 dBZ (light rain) for 15 minutes.
- Do not launch if the flight path will carry the vehicle through a thunderstorm or cumulonimbus debris cloud which is not transparent and less than three hours old. Launch may not occur within five nautical miles of these debris clouds unless: 1) for 15 minutes preceding launch there is at least one working field

mill within five nautical miles of the debris cloud; 2) all electric field mill readings are between -1 kilovolt and + 1 kilovolt per meter within five nautical miles of the flight path; 3) no precipitation has been detected in the debris cloud (less than 10 dbz by radar) within 5 nautical miles of the flight path.

- o Do not launch if the flight path will carry the vehicle through any cumulus cloud that has developed from a smoke plume while the cloud is attached to the plume, or for the first 60 minutes after the cumulus cloud detaches from the smoke plume.

Supporting Table: KSC Seasonal Altitudes of Temperature Levels in thousands of feet

January				July			
Temp	Low	Avg	High	Temp	Low	Avg	High
-4 F	21 Kft	24 Kft	26 Kft	-4 F	23 Kft	27 Kft	29 Kft
14	13	18	21	14	18	21	23
23	9	15	18	23	16	18	20
32	sfc	12	16	32	13	15	18
41	sfc	9	14	41	10	12	15

Range Safety Cloud Ceiling and Visibility constraints:

- o Direct visual observation of the Shuttle is required through 8,000 feet. This requirement may be satisfied using optical tracking sites or a forward observer
- o For cloud ceilings of any thickness between 6,000 feet and 8,000 feet the following conditions must be met for launch to occur:
 - a.) the vehicle integrity can be observed without interruption through 6,000 feet.
 - b.) all required Range Safety instrumentation is functioning properly
 - c.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed
- o For cloud ceilings between 4,000 feet and 6,000 feet the following conditions must be met for launch to proceed:
 - a.) the thickness of the clouds must be less than 500 feet
 - b.) the vehicle integrity can be monitored by the Eastern Range airborne and/or the ground forward observers through 8,000 feet
 - c.) all required Range Safety instrumentation is functioning properly
 - d.) the U.S. Air Force 45th Space Wing Commander approves the decision to proceed

A "Good Sense Rule" is in effect for launch which states: "Even when constraints are not violated, if any other hazardous conditions exist, the launch weather officer will report the threat to the launch director. The launch director may hold at any time based on the instability of the weather."

CONTINGENCY FLIGHT RULES

Weather criteria for an emergency landing must be considered along with launch criteria since the possibility exists for a Return To Launch Site abort (RTLS), landings at the Trans-Oceanic Abort Landing Sites (TAL), the Abort Once Around (AOA) sites and the first day Primary Landing Site (PLS). These forecasts are prepared by

the NOAA National Weather Service Spaceflight Meteorology Group in Houston and briefed by them to the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions except for the first day PLS which is forecast weather only.

- For RTLS with redundant Microwave Landing System (MLS) capability and a weather reconnaissance aircraft, cloud coverage 4/8 or less below 5,000 feet and a visibility of 4 statute miles or greater are required. For AOA and PLS sites, cloud coverage 4/8 or less below 8,000 feet and a visibility of 5 statute miles or greater is required. For TAL sites, cloud coverage 4/8 or less below 5,000 feet and a visibility of 5 statute miles or greater are required.
- For landing on a hard surface runway without redundant Microwave Landing System (MLS) capability all sites require a ceiling not less than 10,000 feet and a visibility of at least 7 statute miles. Landing at night on a lake bed runway may occur if the ceiling is not lower than 15,000 feet and the visibility is 7 miles or greater with at least non-redundant MLS capability .
- For the RTLS site and TAL sites, no thunderstorms, lightning, or precipitation within 20 nautical miles of the runway, or within 10 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- An RTLS rule exception may be made for light precipitation within 20 nautical miles of the runway if the specific criteria listed below are met:
 - a.)** The tops of the clouds containing precipitation do not extend into temperature regions colder than 41 (F.); they have not been colder than 14 (F.) within 2.5 hours prior to launch; the radar reflectivity is less than 30 dbz at all levels within and below the clouds.
 - b.)** Precipitation covers less than 10% of the area within 20 nautical miles of the runway, or multiple heading alignment circles are clear of showers.
 - c.)** The movement of the showers is observed to be consistent and no additional convective development is forecast.
 - d.)** Touchdown/rollout criteria and associated navigational aids meet the specified prelaunch go/no go requirements.

If showers exceed either parameter of part a.) above, an RTLS landing may still occur if a 2 nautical mile vertical clearance can be maintained from the top of any shower within 10 nautical miles of the approach paths.

- For RTLS and TAL sites, no detached opaque thunderstorm anvils less than three hours old within 15 nautical miles of the runway, or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no thunderstorms, lightning or precipitation within 30 nautical miles of the runway, or within 20 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- For RTLS and the TAL sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 15 nautical miles of the runway or within 5 nautical miles of the final approach path extending outward to 30 nautical miles from the end of the runway.
- For AOA and PLS sites, no detached opaque thunderstorm anvil cloud less than 3 hours old within 20 nautical miles of the runway or within 10 nautical miles of the final approach path extending to 30 nautical miles from the end of the runway.
- The RTLS crosswind component may not exceed 15 knots. If the astronaut flying weather reconnaissance

in the Shuttle Training Aircraft executes the approach and considers the landing conditions to be acceptable, this limit may be increased to 17 knots. For the TAL, AOA and PLS sites there is a night-time crosswind limit of 12 knots.

- **Headwind:** not to exceed 25 knots.
- **Tailwind:** not to exceed 10 knots average, 15 knots peak.
- **Turbulence:** conditions must be less than or equal to moderate intensity.

KSC END OF MISSION LANDING WEATHER FLIGHT RULES

The end of mission landing weather forecast is prepared by the NOAA National Weather Service Spaceflight Meteorology Group in Houston for the astronauts, Flight Director and Mission Management Team. All criteria refer to observed and forecast weather conditions. Decision time for the deorbit burn is 70 - 90 minutes before landing. The weather criteria are:

- Cloud coverage of 4/8 or less below 8,000 feet and a visibility of 5 miles or greater required.
- The peak cross wind cannot exceed 15 knots, 12 knots at night. If the mission duration is greater than 20 days the limit is 12 knots, day and night.
- Headwind cannot exceed 25 knots.
- Tailwind cannot exceed 10 knots average, 15 knots peak.
- No thunderstorm, lightning, or precipitation activity is within 30 nautical miles of the Shuttle Landing Facility.
- Detached opaque thunderstorm anvils less than three hours old must not be within 20 nautical miles of the Shuttle Landing Facility, or within 10 nautical miles of the flight path when the orbiter is within 30 nautical miles of the runway.
- Turbulence must be less than or equal to moderate intensity.
- Consideration may be given for landing with a "no go" observation and a "go" forecast if at decision time analysis clearly indicates a continuing trend of improving weather conditions, and the forecast states that all weather criteria will be met at landing time.

WEATHER INSTRUMENTATION

The weather equipment used by the forecasters to develop the launch and landing forecasts is:

- **Radar:** Launch forecasters located at Cape Canaveral Air Station and landing forecasters located in Houston can access displays from two different radar. One is located at Patrick Air Force Base south of Cocoa Beach. The other is located in Melbourne at the National Weather Service and is a NEXRAD Doppler radar. Each radar provides rain intensity and cloud top information out to a distance as far as 200 nautical miles. The NEXRAD radar can also provide estimates of total rainfall and radial wind velocities.
- **Field Mill Network:** Thirty-one advanced field mill sites around KSC and Cape Canaveral Air Station provide data on lightning activity and surface electric fields induced by charge aloft. This data helps forecasters determine when electric charge aloft may be sufficient to create triggered lightning during launch, and to determine when to issue and cancel lightning advisories and warnings.
- **Lightning Detection System:** Detects and plots cloud to ground lightning strikes within 125 nautical miles of the Kennedy Space Center. Location accuracy is optimum within 30 nautical miles. Locations of

strikes are color coded according to time of occurrence.

- **Lightning Detection And Ranging (LDAR):** Developed by NASA at the Kennedy Space Center, LDAR plots intracloud, cloud to cloud and cloud to ground lightning in three dimensions within 100 nautical miles of the Kennedy Space Center. Location accuracy is very high within 25 nautical miles. LDAR data is important in determining the beginning and end of lightning conditions.
- **National Lightning Detection Network:** Plots cloud to ground lightning nationwide. Used to help ensure safe transit of the Space Shuttle orbiter atop the Shuttle Carrier Aircraft between Edwards Air Force Base in California and the Kennedy Space Center in Florida. It is also used to assess lightning beyond the 125 mile range of the Lightning Detection System.
- **Rawinsonde:** A balloon with a tethered instrument package which radios its altitude to the ground together with temperature, dewpoint and humidity, wind speed and direction, and pressure data. Rawinsondes reach altitudes exceeding 100,000 feet.
- **Jimsphere balloon:** A reflective balloon made of mylar tracked by radar which provides highly accurate information on wind speed and wind direction up to 60,000 feet.
- **Doppler Radar Wind Profiler:** Measures upper level wind speed and direction over Kennedy Space Center from approximately 10,000 feet to 60,000 feet. The data, received every 5 minutes, is used to ensure the upper winds used to calculate wind loads on the shuttle vehicle have not significantly changed between balloon soundings. If data from the Doppler Radar Wind Profiler indicates a possible significant change, another Jimsphere balloon is released.
- **Rocketsonde:** A 12-foot-tall instrumented rocket is launched on L-1 day which senses and transmits data on temperature, wind speed and direction, wind shear, pressure, and air density at altitudes between 65,000 feet and 370,000 feet. A four-inch in diameter solid rocket motor separates at an altitude of about 5,000 feet, after which an "instrumented dart" coasts to apogee.
- **Satellite Images and Data:** Provided directly to the satellite terminal at USAF Range Weather Operations and NOAA National Weather Service Space Flight Meteorology Group in Houston by the geostationary GOES weather satellites. In addition high resolution images are received from spacecraft in low earth orbit including both the NOAA and the Defense Meteorological Support Program (DMSP) polar orbiting satellites.
- **Meteorological Interactive Data Display System (MIDDS):** Integrates diverse weather data on a single display terminal-- satellite images, radar, computer generated graphics of surface and upper air map features, numerical weather models, current weather observations, data from meteorological towers, lightning strikes and field mill information.
- **Towers:** 33 meteorological towers are located on Kennedy Space Center and Cape Canaveral Air Station, including two at each launch pad and three at the Shuttle Landing Facility. In addition to wind, most towers are also instrumented with temperature, and moisture sensors. The 60-foot towers at the launch pads and the 33-foot towers at the Shuttle Landing Facility are closely monitored for launch and landing criteria. In addition, on the mainland, there is a network of 19 wind towers which extend outward an additional twenty miles. Tower data is an important short-term forecasting tool and also helps determine the direction and distance of toxic corridors in the event of a mishap.
- **Buoys:** Meteorological buoys are anchored 20, 110 and 160 nautical miles east-northeast of Cape Canaveral. These buoys relay hourly measurements via satellite of temperature, wind speed and direction, barometric pressure, precipitation, sea water temperature, and wave height and period. Buoy data is used for launch, landing, booster retrieval, and daily ground processing forecasts for the Kennedy Space Center and Cape Canaveral Air Station.

- **Solid Rocket Booster Retrieval Ships:** These vessels radio observed weather conditions and sea state from the booster impact area located up to 150 nautical miles downrange.
- **Weather Reconnaissance Aircraft:** A T-38 jet and the Shuttle Training Aircraft are flown by a weather support astronaut.

For [automatic e-mail subscriptions](#) to this [daily Shuttle status report](#) or [KSC-originated press releases](#), send an Internet electronic mail message to domo@news.ksc.nasa.gov. In the body of the message (not the subject line) type the words "subscribe shuttle-status", or "subscribe ksc-press-release" (do not use quotation marks). The system will reply with a confirmation via e-mail of each subscription.

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JOHN F. KENNEDY SPACE CENTER

November 30, 1998

KSC Contact: Joel Wells

KSC Release No. 153-98



AIRSPACE, BRIDGES AND WATERWAY RESTRICTIONS IN EFFECT FOR ALL SPACE SHUTTLE LAUNCHES

Violators of Kennedy Space Center's restricted airspace caused a delay during the final minutes of the recent STS-95 launch countdown. With the STS-88 launch of Space Shuttle Endeavour only days away, NASA managers urge all aircraft pilots, boaters and tourists to comply fully with the airspace, bridges and waterway restrictions imposed during all Shuttle launches.

"The STS-88 launch window is only 5 to 10 minutes, so it is crucial that the Shuttle launch team not be delayed with costly distractions like airspace violators," said KSC Launch Director Ralph Roe. "As always, we are coordinating with officials from the Eastern Range and Federal Aviation Administration (FAA) to help provide a safe launch environment for the Shuttle crew and for interested spectators. Violating these restrictions is not only unsafe for the astronauts its unsafe for the violator."

Space Shuttle Endeavour's first launch opportunity is on Dec. 3. At NASA's request, an increased number of FAA surveillance aircraft will patrol KSC's airspace boundaries on launch day. Violators will be intercepted by patrol forces, thoroughly investigated and will be subject to FAA enforcement action.

A number of restrictions are placed in effect around the Kennedy Space Center (KSC) during the hours immediately preceding and following the launch of a Space Shuttle.

Listed and described below are restrictions that apply to pilots, motor vehicle operators and boaters utilizing airspace, bridges and waterways that lead to KSC.

KSC AREA AVIATION RESTRICTIONS

The airspace immediately above and around KSC will be limited to official aircraft only and will be off-limits to general aviation pilots prior to and during the launch of a Space Shuttle.

NOTAMS must be checked by pilots prior to flights near the KSC area. Pilots are warned that violations of KSC's restricted airspace may likely result in serious penalties, including the suspension or revocation of pilot privileges.

Official aircraft supporting the launch will be in the air. Private pilots must be aware that wandering into a restricted area is not only forbidden, but that it also creates a safety hazard to support aircraft and the errant pilot.

Anyone wishing to view the launch from the air below 11,000 feet should stay west of the Indian River. Above 11,000 feet, pilots should stay west of the St. Johns River. Pilots are advised that the airspace in the KSC vicinity is expected to be congested with both controlled and uncontrolled aircraft.

Pilots should also be aware of the Solid Rocket Booster (SRB) exhaust cloud that occurs after launch. They should stay at least five miles away from the cloud, even if it drifts out of the restricted area. Research aircraft will be flying into and around the cloud, and visibility will be limited.

Generally, the airspace restrictions cover a variety of air ranges. In addition to the usual KSC and Cape Canaveral Air Station airspace restrictions, the upcoming launch requires that all private aircraft stay out of an area roughly bounded by the west side of the Indian River to the west, the Trident Basin (Port Canaveral) to the south, Haulover Canal to the north and 30 miles seaward to the east. These restrictions are "surface to unlimited." Launch-specific restrictions begin three hours prior to the planned launch time.

Pilots should consult the most recent editions of the Jacksonville Sectional Aeronautical Chart and the Airman's Information Manual. In addition, they should contact the St. Petersburg Flight Service Station at 1-800-992-7433. (1-800-WX-BRIEF). Advisories will be available from the Patrick Approach Control (VHF 134.95 megahertz), Space Center Executive Airport Tower (VHF 118.9 megahertz) or the NASA Tower (128.55 megahertz).

Pilots should also refer to the current Patrick Air Force Base news release concerning restricted airspace.

BRIDGES CONTROLLED FOR LAUNCH

The opening and closing of bridges over waterways surrounding KSC will be strictly controlled during the hours immediately before and after the launch period for each Space Shuttle mission.

Bridges affected by the launch include:

- Canaveral Harbor Barge Canal (SR 401, south of Cape Canaveral Air Station's Gate 1);
- Indian River Causeway West or NASA Causeway (Intracoastal Waterway at Addison Point);
- Merritt Island Barge Canal (Merritt Island State Road 3);
- Haulover Canal Bridge (State Road 3, north of KSC).

Restraints on bridge openings for boat traffic begin three hours before launch. The bridges may be opened for five minutes at the following points in the launch countdown: T-180 minutes, T-150 minutes, T-120 minutes, T-90 minutes, and T-65 minutes. Adding 20 minutes to these times and subtracting that amount from the launch time will result in an approximate time of openings.

Bridges will remain closed to boat traffic until 90 minutes after lift-off (T+90). They may then open for five minutes at T+90, T+120 minutes and T+150 minutes. Bridge operations will return to normal three hours (T+180 minutes) after launch.

Should the Shuttle be required to perform a Return-to-Launch-Site (RTL) landing at

KSC, all bridges would remain closed to boat traffic from 45 minutes before landing until at least one hour after landing.

KSC AREA BOATING RESTRICTIONS

Waterways and boating near the Kennedy Space Center will be strictly controlled prior to and during the launch of the Space Shuttle.

Safety and security requirements, including U.S. Air Force range safety impact limit lines, will go into effect as early as three days before launch. Other requirements will be phased into effect through sunset the night before launch. A general description of the area follows:

BANANA RIVER: Security limits begin at the Banana River Barge Canal south of KSC at the State Road 528 crossing and extend north. This restriction is effective roughly 12 hours prior to launch.

ATLANTIC OCEAN: Beginning the day before launch, a general exclusion zone will be in effect three miles offshore from the Haulover Canal, near the north end of KSC, and southward to Port Canaveral. Four hours prior to launch, all ocean-going traffic will be restricted from entering an area measured from five miles north and south of the launch pad and extending 30 miles east into the ocean. Pad 39A is located at latitude 28 degrees, 36 minutes, 29.7014 seconds north; longitude 80 degrees, 36 minutes, 15.4166 seconds west. Pad 39B is located at latitude 28 degrees, 37 minutes, 26 seconds north; longitude 80 degrees, 37 minutes, 15.09 seconds west. An additional three-mile-wide exclusion zone will be extended eastward along the projected flight path of the Space Shuttle.

MOSQUITO LAGOON: This area south of the Haulover Canal is off limits to all boats beginning the day before launch.

INDIAN RIVER: Restrictions apply from the NASA Causeway north to the Haulover Canal and east of the Indian River's main channel. Restrictions begin the day before launch.

All boating restrictions will be lifted approximately one hour after launch.

The U.S. Coast Guard, the U.S. Fish and Wildlife Service, and KSC security forces share responsibility for enforcing the boating guidelines.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 1, 1998

KSC Contact: George H. Diller

KSC Release No. 156-98



U.S. LABORATORY NAME ANNOUNCED TODAY AT KSC

The U.S. Laboratory module, considered the centerpiece of the International Space Station, was named "Destiny" today in honor of its prominent role in the world's largest science and technology effort. The announcement was made in a brief ceremony in front of the module at the Kennedy Space Center's Space Station Processing Facility on Tuesday, Dec. 1.

Participating in the ceremony were Roy D. Bridges, Director, Kennedy Space Center, and Randy Brinkley, Program Manager, International Space Station, Johnson Space Center. Astronauts from the STS-98 flight crew participating included Commander Ken Cockrell; Pilot Mark Polansky; and Mission Specialist Marsha Ivins.

The U.S. Laboratory is planned for launch aboard Space Shuttle Endeavour on the sixth International Space Station construction flight currently targeted to occur on Feb. 3, 2000.

Go to the [KSC Press Releases](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

December 4, 1998

KSC Contact: George H. Diller

KSC Release No. 157-98



Note to Editors/News Directors:

MARS CLIMATE ORBITER SCHEDULED FOR LAUNCH DEC. 10

The launch of NASA's Mars Climate Orbiter spacecraft aboard a Boeing Delta II rocket is scheduled for Thursday, Dec. 10. There are two instantaneous launch opportunities available that day. The target is the first opportunity at 1:56:38 p.m. EST. A second opportunity at 3:02:23 p.m. EST is available if necessary. Liftoff will occur from Pad A at Launch Complex 17 on Cape Canaveral Air Station.

When it first arrives at the red planet, Mars Climate Orbiter will be used primarily to support its companion Mars Polar Lander spacecraft, planned for launch on Jan. 3, 1999. After that, the Mars Climate Orbiter's instruments will monitor the Martian atmosphere and image the planet's surface on a daily basis for one Martian year, the equivalent of two Earth years. During this time, the spacecraft will observe the appearance and movement of atmospheric dust and water vapor, as well as characterized seasonal changes on the surface. The detailed images of the surface features will provide important clues to the planet's early climate history and give scientists more information about possible liquid water reserves beneath the surface.

The Mars Climate Orbiter has completed final checkout and was mated to the Boeing Delta II rocket on Nov. 30. The Delta fairing was installed around the spacecraft on Dec. 4.

PRELAUNCH NEWS CONFERENCE

A prelaunch news conference is scheduled for Wednesday, Dec. 9 at 11 a. m. EST in the KSC News Center auditorium and will be carried live on NASA Television. Participating in the briefing will be:

Dr. Ed Weiler, Associate Administrator for Space Science
NASA Headquarters

Rich Murphy, Delta Mission Director
The Boeing Company

Ray Lugo, NASA Launch Manager
Kennedy Space Center

John McNamee, Spacecraft Mission Director/Mars 98 Project Manager
Jet Propulsion Laboratory

Joel Tumbiolo, Launch Weather Officer

Department of the Air Force

To follow at 12:30 p.m. EST will be a briefing entitled "Top Ten Images of Mars From Mars Global Surveyor. The participants are:

Joe Boyce, 1998 Mars Surveyor Program Scientist
NASA Headquarters

Dr. Michael Malin, Principal Investigator, MGS Mars Orbiter Camera
Malin Space Science Systems

ACCREDITATION

Those media without permanent accreditation who wish to cover the launch of Delta/Mars Climate Orbiter including the prelaunch news conference on L-1 day should send a letter of request to the NASA-KSC News Center on news organization letterhead. It should include name and Social Security number or passport number. Letters should be faxed to 407/867-2692 or addressed to:

Mars Climate Orbiter Launch Accreditation
NASA AB-F1
Kennedy Space Center, FL 32899

STS-88 mission badges will be valid for the prelaunch news conference at the NASA-KSC News Center on Wednesday, Dec. 9. Mars Climate Orbiter mission badges may be picked up at the News Center between 8 a.m. - 4:30 p.m. On launch day, Dec. 10, Mars Climate Orbiter mission badges will be available at Gate 1 on Cape Canaveral Air Station located on SR 401 starting at 12:15 p.m. prior to departure for Press Site 1. A Delta/Mars Climate Orbiter mission badge is required for all news media covering the launch from Press Site 1.

For further information on Mars Climate Orbiter launch accreditation contact Selina Scolah at the NASA News Center at 407/867-2468.

REMOTE CAMERAS

On Wednesday, Dec. 9 at 12 Noon, following the prelaunch news conference, a NASA van will depart from the NASA-KSC News Center for Launch Complex 17 for media photographers who wish to establish remote cameras at Pad 17-A.

LAUNCH DAY PRESS COVERAGE

Media covering the launch should meet at the Gate 1 Pass & Identification Building on Cape Canaveral Air Station. The convoy departure for Press Site 1 will be at 12:30 p.m. After launch, media may leave via Gate 1 only.

NASA TELEVISION AND V CIRCUIT COVERAGE

NASA Television will carry the prelaunch news conference starting at 11 a.m. EST on Wednesday, Dec. 9. On launch day, countdown coverage will begin at 12:30 p.m. EST and conclude when mission success is confirmed. No post launch news conference will be held.

NASA Television is available on GE-2, transponder 9C located at 85 degrees West longitude. Audio only of Delta/Mars Climate Orbiter Surveyor events will also be

available on the "V" circuits which may be dialed directly at 407/867-1260, 407/867-7135, 407/867-4003, 407/867-4920.

The NASA-KSC codaphone will carry Delta/Mars Climate Orbiter prelaunch status reports beginning at L-3 days, on Monday, Dec. 7 and may be dialed at 407/867-2525.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 7, 1998

KSC Contact: Joel Wells

KSC Release No. 158-98



KSC SHUTTLE PROCESSING DIRECTOR ROBERT SIECK TO RETIRE; SUCCESSORS NAMED

Kennedy Space Center's Director of Shuttle Processing Robert B. Sieck has announced his retirement from NASA. Shuttle Processing Deputy Director David A. King will succeed Sieck as director. Additionally, Ralph R. Roe, Jr., will continue in the position of KSC's launch director on a permanent basis.

Sieck joined NASA at Kennedy Space Center in 1964 as a Gemini Spacecraft systems engineer. He later served as an Apollo Spacecraft Test Team project engineer, Shuttle Orbiter Test Team project engineer, and in 1976 was named the engineering manager for the Shuttle approach and landing tests at Dryden Flight Research Center in California. Returning to KSC in 1978, he became the Chief Shuttle Project engineer for STS-1 through STS-7 and the first KSC Shuttle flow director in 1983. In February 1984, he was appointed director, Launch and Landing Operations, where he served as Shuttle launch director for 11 missions.

Sieck served as deputy director of Shuttle Operations (renamed Shuttle Processing in 1996) from April 1992 until January 1995. He was responsible for assisting with the management and technical direction of the Shuttle program at KSC. He also retained his position as Shuttle launch director, a responsibility he had held from February 1984 through August 1985 and then from December 1986 to January 1995. He was launch director for STS-26R and all subsequent Shuttle missions through STS-63, a total of 52 Space Shuttle launches. Sieck has served as director of Shuttle Processing since January 1995.

Sieck recently received one of NASA's most prestigious awards, the Distinguished Service Medal - the highest honor NASA confers upon a government employee. NASA Administrator Daniel Goldin presented the award to Sieck following the launch of STS-88. This award is presented to a person in the federal service who, by distinguished service, ability, or courage has personally made a contribution representing substantial progress to the mission of NASA in the interests of the United States. The contribution must be so extraordinary that other forms of recognition by NASA would be inadequate.

Identifying Sieck as "one of the finest people ever to work at NASA," Goldin stated in presenting the award, "I don't know of anyone that has done more for America's space program than Bob Sieck." We've relied upon him for making sure that the Shuttle is safe, because that's the most important thing." Before presenting the medal, Goldin noted that Sieck was receiving the award for "distinguished service as the Kennedy Space Center launch director and director of Shuttle Processing, sustained outstanding leadership and

total dedication to the success of the Space Shuttle program."

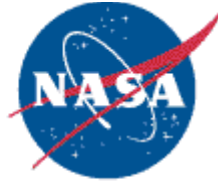
Kennedy Space Center Director Roy Bridges applauded Sieck for the "incredible achievement of serving as Launch Director for over half of all Shuttle launches to date". He also commended Sieck for "the indelible impression he has made on future Shuttle launches by managing the transition of day-to-day processing activities to the prime contractor United Space Alliance to ensure continued safety and effectiveness".

"It's been a privilege for me to be a part of this program since the beginning and to share all the hard work and tough launch decisions," noted Sieck. "I know that the launches and missions are in the hands of the greatest team ever assembled, so I know the program has a great future."

David A. King began his career with NASA in 1983 as a main propulsion engineer. He later served as flow director for the orbiter Discovery and as the acting deputy director of the Installation Operations Directorate. He served as the space center's launch director from December 1997 to July 1998, managing and directing three successful Shuttle missions. King has served as the deputy director of Shuttle Processing since September 1996. As director of Shuttle Processing, King will be responsible for the management and oversight of all activities involving Shuttle processing and launch operations at KSC. He has a bachelor of science degree in mechanical engineering from the University of South Carolina and a master's degree in business administration from the Florida Institute of Technology.

Ralph R. Roe, Jr., began his career at KSC in 1983 serving as a propulsion systems test engineer. He also has been chief of the Fluid Systems Division, Vehicle Engineering directorate, later serving as acting director of Process Engineering. He was named director, Process Engineering, in October 1996, with responsibility for the engineering management and technical expertise of personnel involved in prelaunch, landing, recovery and turnaround operations for the Shuttle fleet. Roe has a bachelor of science degree in mechanical engineering from the University of South Carolina and a master's degree in industrial engineering from the University of Central Florida.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 8, 1998

KSC Contact: David Dickinson

KSC Release No. 159-98



JAN HEUSER NAMED PROGRAM MANAGER FOR SPACE EXPERIMENTS RESEARCH AND PROCESSING LABORATORY PROJECT

Jan Heuser, an experienced manager in the field of engineering development, Shuttle operations, and Shuttle mission assurance has been named program manager for the Space Experiments Research and Processing Laboratory Project by Kennedy Space Center Director Roy Bridges. This project is the first phase of a proposed research industrial park in which KSC will team with Spaceport Florida Authority (SFA) to create a research industrial campus capable of serving a host of governmental, commercial, state, and international organizations involved in space related research.

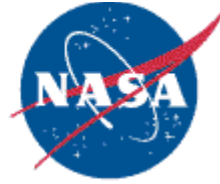
Heuser currently serves as the Associate Director of Installation Operations. Her responsibilities as the program manager for the Space Experiments Research and Processing Laboratory Project will include coordination of NASA Headquarters, State of Florida, and Kennedy Space Center program managers, project managers, and technical experts to assess and determine facility design layouts, cost, funding, and construction milestones.

Heuser brings a considerable amount of experience in program and project management to this endeavor. Her leadership skills have been demonstrated repeatedly having served as Associate Director for Information Technology, Chief of the Electrical Division in the Facilities Engineering and Project Management Directorate, Deputy Chief of the Technology Programs and Commercialization Office, as well as Acting Deputy Director of the Mission Assurance Directorate.

Her educational background includes a master's degree in Heat Transfer from the University of Maryland, and a bachelor's degree in Mathematics and Computer Science from the University of Kentucky. She has received numerous awards during her career including an Exceptional Service Medal, Sustained Superior Performance awards, a Superior Achievement award, and several Group Achievement Awards.

This project has the potential to be a cornerstone for a new era of research and technology development for the Kennedy Space Center. It will provide a core capability to our space-faring customer base which is one of the major objectives in the KSC Strategic Roadmap for the future.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 8, 1998

KSC Contact: George H. Diller

KSC Release No. 160-98



Note to Editors/News Directors:

DELTA ROCKET PHOTO OPPORTUNITY SCHEDULED AT COMPLEX 17

A photo opportunity will be available Thursday, Dec. 10, at Complex 17 for the Delta rocket carrying NASA's Mars Climate Orbiter. Media will be taken to the pad after the mobile service tower has been retracted from around the launch vehicle.

Because of the tight schedule of countdown activities, the amount of time available at the pad for photos will be 30 minutes or less.

Media wishing to participate will depart for the pad by bus at 9:30 a.m. from the Gate 1 Pass & Identification Building.

Launch of NASA's Mars Climate Orbiter remains scheduled for 1:56 p.m. on Dec. 10.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 9, 1998

KSC Contact: George H. Diller

KSC Release No. 161-98



MARS CLIMATE ORBITER LAUNCH POSTPONED

A review of the 1998 Mars Climate Orbiter software designed to protect against hardware failures on the spacecraft has uncovered a flaw that project engineers decided to fix prior to launch. The problem involves a device called the "charge control unit," which regulates the flow of charge from the spacecraft's solar arrays to the battery. If the primary charge control unit were to fail during the mission, the battery could be overcharged and fail before the spacecraft's fault protection software was able to detect the error and command a swap to the backup charge control unit.

"The fix is relatively simple, but we want to be sure we execute a prudent test program that insures that we have actually fixed the problem without creating additional unforeseen problems," said John McNamee, Mars Climate Orbiter project manager at NASA's Jet Propulsion Laboratory, Pasadena, CA. "We have the benefit of using the Mars Polar Lander spacecraft as a testbed to make sure we have accomplished what we intended to accomplish."

Engineers believe the test program will take between 24 and 48 hours to implement, clearing the way for a second launch attempt on Friday, Dec. 11 or Saturday, Dec. 12. Friday's launch times are 1:45:51 p.m. Eastern Standard Time, followed by a second opportunity at 2:52.00 p.m. EST. Saturday's launch times are 1:34:08 p.m. EST and 2:40:49 p.m. EST. Launch of the orbiter's sister spacecraft, the 1998 Mars Polar Lander, carrying the New Millennium Deep Space 2 microprobes, remains on schedule for a Jan. 3, 1999 launch.

NOTE TO EDITORS/NEWS DIRECTORS: If a decision is made for only a 24-hour delay in launch, times will be unchanged for all planned activities. Departure from the NASA News Center for establishing remote cameras at the pad will be at 12 Noon on Thursday. On Friday, bus departure for the photo opportunity of the Delta rocket at Launch Complex 17 pad will be at 9:30 a.m. from the Pass & Identification Building at Gate 1. The media convoy for Press Site 1 will depart Gate 1 at 12:30 p.m. Launch commentary on NASA Television will begin at 12:30 p.m. EST. Coverage will be shared with STS-88 mission activities.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

Dec. 10, 1998



KSC Contact: George H. Diller

KSC Release No. 162-98

MARS CLIMATE ORBITER LAUNCH RESCHEDULED FOR DEC. 11

NASA's Mars Climate Orbiter aboard a Delta II rocket has been cleared for a launch attempt on Friday, Dec. 11. The spacecraft's electrical software has been reviewed and a recommended change is being made today. The two launch opportunities on Friday are at 1:45:51 p.m. EST and 2:52:00 p.m. EST.

The launch weather officer predicts a 30 percent chance of not meeting the launch weather criteria on Friday afternoon. There is the possibility of an isolated shower in the vicinity and some concern for clouds in the area or in the Delta's flight path.

A photo opportunity at Launch Complex 17 is scheduled for Friday morning. Media will be taken to the pad by bus from the Gate 1 Pass & Identification Building at 9:30 a.m. Because of the tight schedule of countdown activities, the amount of time at the pad will be 30 minutes or less.

Media covering the launch will convoy from Gate 1 to Press Site 1 at 12:30 p.m.

NASA Television coverage of the launch will begin at 12:30 p.m. and will be shared with STS-88 mission activities. However, audio coverage of the Mars Climate Orbiter launch will be maintained continuously on the following "V-circuit" numbers: 407/867-1260, 407/867-7135, 407/867-4003, 407/867-4920.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 10, 1998

KSC Contact: George H. Diller

KSC Release No. 163-98



HESSI SPACECRAFT TO BE LAUNCHED ABOARD PEGASUS XL

With just one month having passed since NASA's award of the KSC Small Expendable Launch Vehicle Services (SELVS-KSC) contracts, KSC has issued the first "launch services task order." This task order for The High Energy Solar Spectroscopic Imager (HESSI) spacecraft, part of NASA's Small Explorer satellite program, has been awarded to Orbital Sciences Corporation of Dulles, Va. as part of the Indefinite Delivery/Indefinite Quantity terms of the contract.

These SELVS-KSC contracts give NASA the ability to provide responsive and timely launch services to help fulfill the goals and objectives of NASA's Human Exploration and Development of Space enterprise, the Earth Science enterprise and the Space Science enterprise. NASA anticipates award of up to 16 missions over the contracts' 5-year period. The minimum value of each contract is \$100,000. The maximum value of each contract is \$400 million. The first launch services task order provides for HESSI to be launched by Orbital's Pegasus XL vehicle from Cape Canaveral Air Station, FL or Wallops Flight Facility, Va. in July 2000 concurrent with the next Solar Maximum.

HESSI will provide both images and energy spectra of solar flare X-rays and gamma rays. During its two to three year lifetime, it is expected to return data from about 1000 hard X-ray flares and 100 gamma ray flares. The primary scientific objective of HESSI is to understand the particle acceleration and explosive energy release in the magnetized plasma at the Sun. As the most powerful particle accelerator in the solar system, solar flares release as much energy as several billion tons of TNT. How the Sun releases this energy, presumably stored in the magnetic fields of the corona, and how it rapidly accelerates electrons and ions with such high efficiency and to such high energies, is presently unknown.

The data provided by HESSI could help us to understand the characteristic radiation signatures of solar flares that effect Earth's space environment including spacecraft and radio communications. In addition, the features to be imaged with HESSI, require technology which would provide the capability to see a penny with X-rays at a distance of over a mile. This type of imaging technology developed for use on HESSI has potential applications in the medical, industrial, and nuclear fields.

The HESSI mission is being managed for NASA by the University of California at Berkeley. More information about HESSI can be found at <http://ssl.berkeley.edu/hessi/>.



JOHN F. KENNEDY SPACE CENTER

December 14, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 164-98



Note to Editors:

ENDEAVOUR SCHEDULED TO LAND AT KSC COMPLETING MISSION STS-88

The orbiter Endeavour is scheduled to land at Kennedy Space Center on Tuesday Dec. 15 at about 10:56 p.m. EST completing its 12-day STS-95 mission which was launched from KSC on Dec. 4.

Landing at KSC's Shuttle Landing Facility (SLF) is slated to occur on orbit 186 at mission elapsed time 11 days, 19 hours, 20 minutes. Deorbit burn will occur at about 9:51 p.m. Tuesday.

The two KSC landing opportunities on Tuesday/Wednesday are: 10:56 p.m. (Dec. 15) and 12:32 a.m. (Dec. 16) EST.

Managers have decided not to call up the back-up landing location at Edwards Air Force Base (EAFB), CA, for a possible landing on Tuesday.

If managers must keep Endeavour in orbit an additional day, two landing opportunities are available on Wednesday at KSC and two at EAFB.

KSC Wednesday (Dec. 16) landing times are: 9:59 p.m. and 11:35 p.m. EST.

EAFB Wednesday/Thursday landing times are: 1:06 a.m. (Dec. 17) and 2:43 a.m. (Dec. 17) EST.

This landing of Endeavour will mark the 46th landing at KSC in the history of Space Shuttle flight. It will be the 17th consecutive landing at KSC and the 24th in the last 25 shuttle flights. This landing will mark the 10th nighttime landing of the Space Shuttle, the 5th nighttime landing at KSC. Endeavour is currently on the 93rd Space Shuttle mission in the history of the program.

Following landing, select members of the crew are scheduled to participate in a press conference at the KSC Press Site auditorium. The event will be carried live on NASA TV beginning at about 7 a.m. Wednesday, Dec. 16. The entire crew will depart for Houston, TX, at about 8 a.m. Thursday, Dec. 17.

SLF and KSC Ground Operations

The Shuttle Landing Facility was built in 1975. It is 300 feet wide and 15,000 feet long with 1,000 foot overruns at each end. The strip runs northwest to southeast and is located

about 3 miles northwest of the 525-foot tall Vehicle Assembly Building.

Once the orbiter is on the ground, safing operations will commence and the flight crew will prepare the vehicle for post-landing operations. The Crew Transport Vehicle (CTV) will be used to assist the crew, allowing them to leave the vehicle and remove their launch and re-entry suits easier and quicker.

The CTV and other KSC landing convoy operations have been "on-call" since the launch of Endeavour, Dec. 4. The primary functions of the Space Shuttle recovery convoy are to provide immediate service to the orbiter after landing, assist crew egress, and prepare the orbiter for towing to the Orbiter Processing Facility.

Convoy vehicles are stationed at the SLF's mid-point. About two hours prior to landing, convoy personnel don SCAPE suits, or Self Contained Atmospheric Protective Ensemble, and communications checks are made. A warming-up of coolant and purge equipment is conducted and nearly two dozen convoy vehicles are positioned to move onto the runway as quickly and as safely as possible once the orbiter coasts to a stop. When the vehicle is deemed safe of all potential explosive hazards and toxic gases, the purge and coolant umbilical access vehicles move into position at the rear of the orbiter.

Following purge and coolant operations, flight crew egress preparations will begin and the CTV will be moved into position at the crew access hatch located on the orbiter's port side. A physician will board the Shuttle and conduct a brief preliminary examination of the astronauts. The crew will then make preparations to leave the vehicle.

Following departure from the SLF, the crew will be taken to their quarters in the O&C Building, meet with their families and undergo physical examinations. The crew is scheduled to depart for JSC Thursday morning.

If Endeavour lands at Edwards, an augmented KSC convoy team will be on-site to safe the vehicle, disembark the crew and move the orbiter to the Mate/Demate Device. The turnaround team will be deployed to Edwards by charter aircraft on landing day.

After Endeavour lands at KSC, the orbiter will be towed to Orbiter Processing Facility bay 2 for post-flight deservicing. Operations in the OPF will be made to prepare Endeavour for its next Space Shuttle mission, STS-99, currently targeted for launch in September.

-- end --

NOTICE TO EDITORS: The KSC press site will be open Tuesday, Dec. 15, from 8 a.m. - round-the-clock - to 4:30 p.m. Wednesday, Dec. 16. Media wishing to view Endeavour's landing should be at the KSC press site prior to 9:30 p.m. Tuesday for transport to the SLF. Accreditation must be arranged in advance.

Additional specific information regarding landing photo opportunities, post-landing press conferences and KSC News Center operational hours is available at the KSC News Center. Recorded status of KSC Space Shuttle launch and landing operations can be reached by calling 407-867-2525.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 14, 1998

KSC Contact: Bruce Buckingham

KSC Release No. 165-98



GORDON NAMED DIRECTOR KSC PUBLIC AFFAIRS

Joseph "Joe" Gordon, Jr. has been named as the new NASA director of Public Affairs for Kennedy Space Center, effective Dec. 10, 1998. He succeeds Hugh Harris who retired from NASA in April 1998.

Gordon is responsible for leading the center's public affairs efforts, including media and community relations; aerospace education; tours and briefings of distinguished visitors; guest activities for launches, landings and special events; and the KSC Visitor Complex.

Gordon came to NASA from the Office of the Special Assistant for Gulf War Illnesses, Office of the Deputy Secretary of Defense, where he served as the civilian director of public affairs for one of the Department's most sensitive issues. He assumed those responsibilities in September 1997, following his retirement from the U.S. Marine Corps after more than 29 years of service.

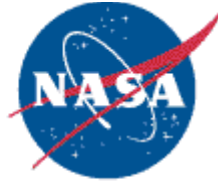
Gordon joined the Marine Corps in 1968 with the Platoon Leader Class Program.

Commissioned a second lieutenant in 1971, he held a variety of assignments to include command and staff positions, while serving numerous tours of duty with Fleet Marine Forces, Atlantic and Pacific, in the United States and overseas. He also served a command tour as a battalion inspector-instructor training Marine Reserves for active duty with Fleet Marine Forces.

Assigned to Marine Corps Headquarters in 1990, he served as the executive assistant to the deputy Chief of Staff for Installations and Logistics and later as the deputy director of Marine Corps Public Affairs.

Reporting to the Pentagon in 1994, he was named director for management and executive assistant in the Office of the Assistant Secretary of Defense for Public Affairs, where he planned and led program activities in community relations, public communications and defense information.

Gordon is a graduate of Edinboro State University in Pennsylvania, where he received a bachelor of arts degree in Political Science. He is married to the former Debbie West of Richmond, Va. Their daughter, Leah, attends Mary Washington College in Fredericksburg, Va.



JOHN F. KENNEDY SPACE CENTER

December 16, 1998

KSC Contact: Joel Wells

KSC Release No. 166-98



Note to Editors:

REUSABLE LAUNCH VEHICLE COMPLEX GROUNDBREAKING SET FOR DEC. 18

NASA's Kennedy Space Center and the Spaceport Florida Authority (SFA) will begin construction of an \$8 million Reusable Launch Vehicle (RLV) Support Complex at a ground breaking ceremony near the Space Shuttle Landing Facility (SLF) Dec. 18.

Plans for the complex, to be located on the tow-way at the south end of the SLF, include a multi-purpose RLV hangar and adjacent facilities for related ground support equipment and administrative/technical support. Intended to support the Space Shuttle and other RLV and X-vehicle systems, the new complex is jointly funded by SFA, NASA's Space Shuttle Program, and KSC. A four-phased development plan promises completion of the complex by year 2000, in time to support possible test flights of the X-34 RLV technology demonstrator and proposed VentureStar RLV.

"Phase one of this development plan includes the construction of a multipurpose hangar," explains KSC Director Roy Bridges. "This groundbreaking does not only start the construction of a hangar, but it marks an important milestone in our joint effort with Florida to expand the world class capabilities at KSC."

The Spaceport Florida Authority was established in 1989 by Florida's governor and legislature to assist space-related enterprises statewide and to coordinate state government support to the space transportation industry. "This project is a prerequisite to accommodating some of our nation's next-generation space transportation systems and a perfect example of the kind of federal/state cooperation envisioned in the National Space Policy," said SFA Executive Director Ed O'Connor.

NASA and the Spaceport Florida Authority officials will be joined at the ground breaking by federal and state elected officials who support the partnership initiative. The event begins Friday, Dec. 18 at 11:30 a.m. on the SLF tow-way. In the event of inclement weather, the groundbreaking announcement will be made indoors at the KSC Visitors Complex the same day.

FINAL NOTE: Media will have an opportunity to speak with the major players in this partnership following the event. Interested media should contact the KSC Press Site by 4:30 p.m. on Dec. 17 to arrange for accreditation and must report to the Press Site by 10:30 a.m. on Dec. 18 for escort to the ceremony. This event will not be carried live on NASA TV, but tapes of the ceremony and conceptual images of the complex will be available afterwards.

Go to the [*KSC Press Releases*](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 16, 1998

KSC Contact: George H. Diller

KSC Release No. 167-98



GOES-L WEATHER SATELLITE ARRIVES AT KSC FOR FINAL TESTING

The GOES-L weather satellite, to be launched aboard an Atlas II rocket in late March or early April, arrived today by C-5 air cargo plane at the Skid Strip on Cape Canaveral Air Station from the manufacturing plant in Palo Alto, CA.

GOES-L is the fourth spacecraft to be launched in the new advanced series of geostationary weather satellites for the National Oceanic and Atmospheric Administration (NOAA). The spacecraft is a three-axis inertially stabilized weather satellite which has the dual capability of providing pictures while performing atmospheric sounding at the same time. Once in orbit the spacecraft is to be designated GOES-11 and will complete check-out before the start of the 1999 hurricane season.

The satellite is being transported today to Astrotech in Titusville where final testing of the imaging system, instrumentation, communications and power systems will be performed. These tests will take approximately two months to complete. Then the spacecraft will be fueled with propellant for the attitude control system, encapsulated in the Atlas nose fairing and prepared for transport to Launch Complex 36 on Cape Canaveral Air Station.

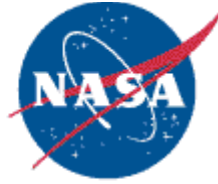
The Lockheed Martin Atlas II rocket and its Centaur upper stage are scheduled to arrive at Cape Canaveral on Feb 9.

The booster erection activities at Launch Pad 36-A will begin on Feb. 15 with the erection of the Atlas stage. The Centaur will follow on Feb. 17. A countdown "wet dress" rehearsal in which the vehicle is fully fueled is anticipated to occur one month later on March 16. Once this is complete the satellite will be transported from Astrotech to the launch pad for mating to the Atlas II rocket, currently planned on March 18. The launch of AC-137/GOES-L is targeted for March 31.

The GOES-L satellite is built for NASA and NOAA by Space Systems/LORAL of Palo Alto, CA. NASA's Goddard Space Flight Center in Greenbelt, MD., is responsible for the procurement of the GOES satellites for NOAA including final testing in Florida and the initial on-orbit checkout. NOAA is responsible for satellite operation, data distribution and management of the program.

As a government civil launch, Kennedy Space Center is responsible for the launch services management which includes NASA oversight of the launch vehicle processing activities, integration of the GOES-L spacecraft with the Atlas II and management of the government role in the launch countdown activities. Lockheed Martin of Denver, CO., is under contract to KSC to provide the launch services.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 18, 1998

KSC Contact: George H. Diller

KSC Release No. 168-98



THOMAS BREAKFIELD AND JOEL REYNOLDS RETIRE FROM NASA; CHRIS FAIREY AND ANN MONTGOMERY ASSIGNED TO LEADERSHIP POSITIONS

P. Thomas Breakfield III, Director of Safety and Mission Assurance at Kennedy Space Center and Joel R. Reynolds, KSC Safety Assurance Director, have announced their retirement from NASA. J. Chris Fairey will succeed Breakfield as director, and Ann D. Montgomery will move up to Deputy Director of Safety and Mission Assurance. This will form the Safety and Mission Assurance management team at KSC.

Breakfield joined NASA in 1964 and served as a data systems/electronics engineer involved in the development of real-time guidance and navigation data processing software for Saturn launch vehicles, Apollo launch data systems and lunar module data reduction software. In 1973 he was assigned to the newly formed Shuttle Launch Processing System and was project manager for the Central Data Subsystem design team. In 1979 he became chief of the Shuttle Launch Processing System Division. In May 1983, Breakfield was assigned to the Shuttle Engineering Directorate and in December 1983 became Deputy Director, Shuttle Engineering. From December 1985 until he was appointed to his current position in 1996, he was Director, Payload Flight Operations. This responsibility included payload assembly, integration, prelaunch checkout, the orbiter interface verification testing, as well as the postflight deintegration of experiments and reusable payloads including Spacelab.

"My thirty-four years with NASA at the Kennedy Space Center have been very rewarding to me. It was my dream as a college student to be a part of the newly created NASA and it has truly been a dream come true! I have had the opportunity to be directly involved in the most exciting work in the universe, and to work with some of the greatest people in the world. While I look forward to this new phase of my life, I will miss the excitement and challenge of processing and launching the vehicles and their payloads, and most of all, the daily contact with those fantastic folks who have become family, said Breakfield.

Joel R. Reynolds joined NASA at the Kennedy Space Center in 1969 as a fire protection engineer. From 1979 to 1994, he managed the KSC Operations Safety Program including the Space Shuttle, payloads and expendable vehicles. He directed the planning for NASA's emergency response efforts for the Galileo and Ulysses missions. In his current position as director of Safety Assurance, he is responsible for providing management and direction to the KSC Safety and Reliability programs including the Space Shuttle, expendable vehicles, payloads, the International Space Station and Industrial Safety Divisions.

"I'd like to reacquaint myself with my family and I am looking forward to some new experiences with them. The friendships I have made over thirty years are the treasures of

my career. Those I shall miss the most," said Reynolds.

J. Chris Fairey, who will succeed Breakfield as director, is the present director of Shuttle Process Integration. He previously held the position of Director of Quality Assurance at Kennedy Space Center covering the Space Shuttle, expendable vehicles, payloads and the International Space Station. He was appointed to this position in June 1995. Concurrently in 1998, he was the Acting Director of the Joint Performance Management Office with Kennedy Space Center and the 45th Space Wing. Fairey joined NASA in 1969 and served as the lead station engineer and test conductor for the Facilities and Environmental Measurement Station in support of the Apollo, Skylab and ASTP programs. In 1980, he served as Operations Section Chief for the Launch Processing System for Checkout, Control and Monitor Systems for the Space Shuttle. In 1984, he was assigned to the Guidance and Digital Systems Division of Shuttle Engineering. He served as a Shuttle Project Engineer for fifteen missions beginning in 1985. In 1991 he was assigned as Orbiter Discovery's flow director for four missions and in 1993 was appointed as the Deputy Director, Shuttle Ground Engineering.

Ann D. Montgomery, who will move up to Deputy Director of Safety and Mission Assurance, is the present Director, Quality Assurance at the Kennedy Space Center, appointed in July, 1998. Prior to that time beginning in 1989 she held several positions of leadership in Logistics including deputy director and acting director of Logistics Operations. From 1986 to 1989 Montgomery was the Flow Director for Orbiter Columbia, responsible for the management of all activities, government and contractor, associated with processing Columbia for each assigned mission. Prior to that time, beginning in 1989, she was the manager of the Orbiter Processing Facility. Montgomery joined NASA in 1968 and worked as a lead crew systems engineer on the Apollo, Skylab and Apollo-Soyuz Test Project.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 18, 1998

KSC Contact: Lisa Malone

KSC Release No. 169-98



KSC EXTENDS THE BOEING COMPANY PAYLOAD PROCESSING CONTRACT

NASA's Kennedy Space Center has awarded The Boeing Company at KSC the final three-year contract extension for payload ground operations service.

The value of this option is \$331.9 million which brings the total value of the 15-year contract to \$1.8 billion. This contract extension is effective Jan. 1, 1999, and ends Dec. 31, 2001.

This is the fifth and final extension of the payload ground operations contract awarded since the original contract was initiated in January 1987 with McDonnell Douglas Space and Defense Systems.

Under the cost-plus-award-fee/incentive-fee performance based contract, The Boeing Company will continue to provide ground support, test and integration for payload operations at Kennedy Space Center.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 21, 1998

KSC Contact: George H. Diller

KSC Release No. 170-98



NASA SELECTS NEW NAME AND SETS NEW LAUNCH DATE FOR ADVANCED SPACE X-RAY TELESCOPE

NASA today set a new target launch date for the Advanced X-ray Astrophysics Facility (AXAF), and announced that it will be renamed the Chandra X-ray Observatory in honor of the late Indian-American Nobel Laureate Subrahmanyan Chandrasekhar.

The Chandra X-ray Observatory will be shipped to NASA's Kennedy Space Center, FL, on or before January 28 and launched no earlier than April 8, 1999. The launch date will be subject to the actual shipping date and the results of a mid-February independent review of the progress towards preparing the operations center in Cambridge, MA, for launch.

Chandra will be carried to space aboard the Space Shuttle Columbia on mission STS-93, commanded by astronaut Eileen Collins. The shipment of the spacecraft was delayed in mid-October so the prime contractor, TRW Space and Electronics Group, Redondo Beach, CA, could complete testing on flight software.

"Chandra," a shortened version of Chandrasekhar's name, which he preferred among friends and colleagues, was chosen in a contest to rename AXAF. "Chandra" also means "Moon" or "luminous" in Sanskrit. The winners are a high school student in Laclede, ID, and a teacher in Camarillo, CA.

"Chandrasekhar made fundamental contributions to the theory of black holes and other phenomena that the Chandra X-ray Observatory will study. His life and work exemplify the excellence that we can hope to achieve with this great observatory," said NASA Administrator Daniel Goldin.

"Chandra probably thought longer and deeper about our universe than anyone since Einstein," said Martin Rees, Great Britain's Astronomer Royal.

Chandrasekhar, widely regarded as one of the foremost astrophysicists of the 20th century, won the Nobel Prize in 1983 for his theoretical studies of physical processes important to the structure and evolution of stars. He and his wife immigrated from India to the U.S. in 1935. He served on the faculty of the University of Chicago until his death in 1995.

The Chandra X-ray Observatory will help astronomers world-wide better understand the structure and evolution of the universe by studying powerful sources of x-rays such as exploding stars, matter falling into black holes and other exotic celestial objects. X-ray astronomy can only be done from space because Earth's atmosphere blocks x-rays from reaching the surface. Chandra will provide images that are fifty times more detailed than previous x-ray missions. At more than 45 feet in length and weighing more than five tons,

it will be one of the largest objects ever placed in Earth orbit by the Space Shuttle.

Tyrel Johnson, a student at Priest River Lamanna High School in Priest River, ID, and Jatila van der Veen, a physics and astronomy teacher at Adolfo Camarillo High School, in Camarillo, CA, submitted the winning name and essays. They will receive a trip to the Kennedy Space Center in Florida to view the launch of the Chandra X-ray Observatory, a prize donated by TRW. In all, 59 people submitted the name "Chandra." Altogether, the contest drew more than 6,000 entries from all 50 states and 61 countries. The seven members of the selection committee included a top aerospace executive, journalists, scientists and a university professor.

The Chandra X-ray Observatory program is managed by the Marshall Space Flight Center, Huntsville, AL, for NASA's Office of Space Science, Washington, DC. The Smithsonian Astrophysical Observatory (SAO) controls science and flight operations of the observatory for NASA from Cambridge, MA.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

December 23, 1998

KSC Contact: George H. Diller

KSC Release No. 171-98



Note to Editors/News Directors:

MARS POLAR LANDER SCHEDULED FOR LAUNCH JAN. 3

The launch of NASA's Mars Polar Lander spacecraft aboard a Boeing Delta II rocket is scheduled for Sunday, Jan. 3, 1999. There is a single 30-second launch window available which opens at 3:21:10 p.m. EST. No second opportunity is available that day. The next available window is on Monday, Jan. 4 at 3:13:34 p.m. EST. Liftoff will occur from Pad B at Launch Complex 17 on Cape Canaveral Air Station.

The solar-powered spacecraft is designed to touch down on the Martian surface above the northern-most boundary of the south polar cap, which is made of carbon dioxide ice. The lander will study the polar water cycle, frosts, water vapor, condensates and dust in the Martian atmosphere. The Deep Space 2 microprobes are installed on the lander's cruise stage. These two probes, developed by NASA's New Millennium Program, will test technology and instruments to search for water several feet below the Martian surface.

The Mars Polar Lander has completed final checkout and was mated to the Boeing Delta II rocket on Dec. 23. The Delta fairing is to be installed around the spacecraft on Dec. 29.

PRELAUNCH NEWS CONFERENCE

A prelaunch news conference is scheduled for Saturday, Jan. 2 at 11 a. m. EST in the KSC News Center auditorium and will be carried live on NASA Television. Participating in the briefing will be:

Dr. Ed Weiler, Associate Administrator for Space Science
NASA Headquarters

Ray Lugo, NASA Launch Manager
Kennedy Space Center

Rich Murphy, Delta Mission Director
The Boeing Company

Dr. John McNamee, Mars Surveyor 98 Project Manager/Mission Director
Jet Propulsion Laboratory

Sarah Gavit, Deep Space 2 Project Manager
Jet Propulsion Laboratory

Dr. Ed Euler, Program Manager

Lockheed Martin Astronautics

Joel Tumbiolo, Launch Weather Officer
Department of the Air Force

The NASA News Center will open for the prelaunch news conference at 9 a.m. and close at 2 p.m.

ACCREDITATION

Those media without permanent accreditation who wish to cover the launch of Delta/Mars Polar Lander including the prelaunch news conference on L-1 day should send a letter of request to the NASA-KSC News Center on news organization letterhead. It should include name and Social Security number or passport number. Letters should be faxed to 407/867-2692 or addressed to:

Mars Polar Lander Launch Accreditation
NASA AB-F1
Kennedy Space Center, FL 32899

Mars Polar Lander mission badges may be picked up at the News Center between 8 a.m. - 4:30 p.m. beginning Monday, Dec. 28. On launch day, Jan. 3, Mars Polar Lander mission badges will be available at Gate 1 on Cape Canaveral Air Station located on SR 401 starting at 1:30 p.m. prior to departure for Press Site 1. A Delta/Mars Polar Lander mission badge is required for all news media covering the launch from Press Site 1.

For further information on Mars Polar Lander launch accreditation contact Selina Scolah at the NASA News Center at 407/867-2468.

REMOTE CAMERAS

On Saturday, Jan. 2 at 12 Noon, following the prelaunch news conference, a NASA van will depart from the NASA-KSC News Center for Launch Complex 17 for media photographers who wish to establish remote cameras at Pad 17-B.

PHOTO OPPORTUNITY AT LAUNCH COMPLEX 17

A photo opportunity of the Delta launch vehicle for Mars Polar Lander will be available at Pad 17-B after tower-rollback. Media wishing to participate will depart the Gate 1 Pass & Identification Building on Cape Canaveral Air Station at 8:30 a.m. on launch day, Jan. 3.

LAUNCH DAY PRESS COVERAGE

On Jan. 3, media covering the launch should meet at the Gate 1 Pass & Identification Building on Cape Canaveral Air Station. The convoy departure for Press Site 1 will be at 2:00 p.m. After launch, media may leave via Gate 1 only. The NASA News Center at KSC will be open from 9 a.m. until 4:30 p.m.

NASA TELEVISION AND V CIRCUIT COVERAGE

NASA Television will carry the prelaunch news conference starting at 11 a.m. EST on Saturday, Jan. 2. On launch day, countdown coverage will begin at 2 p.m. EST and conclude when mission success is confirmed approximately one hour later. No post-launch news conference will be held.

NASA Television is available on GE-2, transponder 9C located at 85 degrees West longitude. Audio only of Delta/Mars Polar Lander events will also be available on the "V" circuits which may be dialed directly at 407/867-1220, 407/867-1240, 407/867-1260, 407/867-7135, 407/867-4003, 407/867-4920.

The NASA-KSC codaphone will carry Delta/Mars Polar Lander prelaunch status reports beginning at L-3 days, on Thursday, Dec. 31 and may be dialed at 407/867-2525.

Go to the [KSC Press Releases](#) Home Page

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

December 30, 1998

KSC Contact: George H. Diller

KSC Release No. 172-98



Note to Editors/News Directors:

TIME OF LAUNCH DAY DELTA II PHOTO OPPORTUNITY CHANGED

The photo opportunity for news media at Pad 17-B for the Delta II rocket which is carrying NASA's Mars Polar Lander has been changed from the 8:30 a.m. time as issued in some previous releases. Media should meet at the Gate 1 Pass & Identification Building on Cape Canaveral Air Station at the new time of 10 a.m. on Sunday, Jan. 3. The amount of time available at the pad will be approximately 30-minutes.

Also, Dr. John McNamee, Mars Polar Lander Project Manager from the Jet Propulsion Laboratory will be available at the pad to answer questions and to do interviews if requested.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

October 28, 1998

KSC Contact: George H. Diller

KSC Release No. c98-r



NASA AWARDS LAUNCH SERVICES CONTRACTS FOR SMALL PAYLOADS

NASA has awarded two contracts to provide launch services for NASA and NASA-sponsored small-class payloads under the Small Expendable Launch Vehicle Services (SELVS-KSC) contracts. The companies are Coleman Research Corp., Orlando, FL, and Orbital Sciences Corp., Dulles, VA. The contracts will be administered by NASA's Kennedy Space Center (KSC), FL, and will include launches from Kennedy Space Center/Cape Canaveral Air Station, FL; Vandenberg Air Force Base, CA; and Wallops Flight Facility, VA.

The SELVS-KSC contracts will help fulfill the goals and objectives of NASA's Human Exploration and Development of Space enterprise, the Earth Science enterprise and the Space Science enterprise. The SELVS-KSC contracts are "Indefinite Delivery/Indefinite Quantity" contracts, meaning that the quantity of services to be provided will vary with NASA's needs.

NASA anticipates award of up to 16 missions over the contract's 5-year period. The minimum value of each contract is \$100,000. The maximum value of each contract is \$400 million. The contracts are 95 percent fixed price, with the remaining 5 percent allowed for performance of special studies.

Loren Shriver, KSC's Deputy Director for Launch and Payload Processing, was the source selection authority for this procurement. "This is the first launch services acquisition activity performed by the Kennedy Space Center since being designated as the Lead Center for Acquisition and Management of Expendable Launch Vehicle Launch Services," said Shriver. "It will enable us to better serve our payload customers who will be flying small payloads. We look forward to partnering with Coleman and Orbital to provide excellent support to our Earth and Space Science Enterprise customers."

The launch vehicle to be used by Coleman Research Corporation under the contract will be the LK-0. The launch vehicles to be used by Orbital Sciences Corporation under the contract will be the Pegasus XL and the Taurus. Related work will be performed by Coleman Research Corp. in Orlando, FL, and by Orbital Sciences Corp. in Dulles, VA, and Chandler, AZ.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

February 13, 1998

KSC Contact: William R. Johnson

Release No. N98-14



STS-95 CREW MEDIA OPPORTUNITY SET FOR FEBRUARY 20

A press opportunity with members of the STS-95 crew will be held on Friday, Feb. 20, at NASA's Johnson Space Center, Houston, TX, from 3 p.m. to 4:30 p.m. EST.

STS-95 Mission Commander Curt Brown will introduce his crew and they will talk briefly with reporters about their upcoming mission, which is slated for a late October launch. Joining Brown on the flight are Pilot Steve Lindsey, Mission Specialists Scott Parazynski, Steve Robinson, and European Space Agency astronaut Pedro Duque, along with two payload specialists -- Senator John Glenn and Chiaki Mukai from the Japanese Space Agency (NASDA).

The press conference marks the completion of the crew's first week of training together and coincides with the 36th anniversary of Glenn's first space mission, a five-hour flight on-board the Friendship 7 capsule in 1962.

Video background footage showing various crew training activities taken earlier in the week will be shown on Feb. 20 during the NASA Television Video File broadcasts and also following the press conference. NASA plans to offer periodic crew-training media opportunities for news media, and the agency also plans to document crew training in both still and video imagery for release on a regular basis.

On Thursday, Feb. 19, there will be a photo opportunity with John Glenn in connection with a centrifuge training session at Brooks Air Force Base in San Antonio, TX. For more information on the centrifuge photo opportunity, news media representatives should contact the Brooks Air Force Base Public Affairs Office at 210/536-3234.

NASA Television is available through the GE-2 satellite, transponder 9C located at 85 degrees West longitude, vertical polarization, with a frequency of 3880 MHz, and audio at 6.8 MHz. Journalists may ask questions during the press conference from participating NASA field centers. The daily NASA Video File airs on NASA Television at 12 noon, 3 p.m., 6 p.m. and 9 p.m. EST each weekday.

Important Note: Media wishing to attend the press conference at Johnson Space Center, must contact the Johnson Newsroom by noon Thursday, Feb. 19, for badging and registration. The newsroom can be reached by phone at 281/483-5111 or by fax at 281/483-2000.

NASA News Release

ONLINE



JOHN F. KENNEDY SPACE CENTER

May 19, 1998

KSC Contact: Jim Ball

Note to Editors No. N98-34



Note to Editors:

NASA EMBRACES SPACE DAY '98

NASA Administrator Daniel S. Goldin will "chat" with students around the world on May 21 between 10 a.m. and 10:30 a.m. EDT via the Internet, as part of this year's Space Day celebration.

Cyber Space Day, an interactive webcast devoted to space, will broadcast from the Mall in Washington, DC, from 10 a.m. to 6 p.m. EDT. The webcast will allow students to conduct live interviews with prominent figures from the public and private sectors who have made significant contributions to space exploration. Other "chat" participants include: Senator John Glenn; Barbara Morgan, astronaut candidate/education mission specialist; David Levy, amateur astronomer, author and comet discoverer; and Dr. Mae Jemison, former astronaut and college professor.

"I am pleased to see Space Day focus on education and embrace children as well as their parents and teachers," said Administrator Goldin. "NASA appreciates the role Space Day plays in helping to communicate the importance of science, mathematics and technology education. These efforts help lay the foundation for inspiring the children of the world to reach for the stars."

Space Day is sponsored by the National Advisory Board co-chaired by Sen. Glenn and Norman Augustine, Chairman of the Board of Lockheed Martin, to stimulate interest in science, math and technology education through the excitement of space exploration. NASA along with more than 34 partner organizations in the educational, scientific, public and private sectors have joined to celebrate this national event.

The global celebration of Space Day '98 will kick off at 9 a.m. EDT. In recognition of Space Day, NASA Centers around the country will host the following events:

NASA Headquarters, Washington, DC - May 21st -- Senator John Glenn, Payload Specialist, STS-95, will serve as featured speaker at the NASA Research and Human Health Symposium at George Washington University in the Dorothy Betts Marvin Theatre from 2 p.m. - 5 p.m. For more information please visit:

<http://www.gwu.edu/~spi>

Ames Research Center, Moffet Field, CA - May 21st -- 1,250 elementary school students and their teachers will participate in over twenty-five activities about the Moon and space exploration. Students will build a Lunar Prospector model, participate in a mission simulation, make their own craters, construct a lunar habitat, and meet astronauts.

Additional information on this event can be found at:

<http://lunar.arc.nasa.gov>

Jet Propulsion Laboratory, Pasadena, CA - May 20-21st -- "A Day on Europa" will take place on May 20-21, since daylight on Europa lasts about two Earth days. Scheduled activities in numerous American cities will be transformed into global village events via the Internet. Highlights will include new imagery of Europa taken by the Galileo spacecraft and a free panel discussion entitled "Europa - Another Water World?" For more information go to: <http://www.caltech.edu/~tickets/to.htm> For other A Day on Europa events and activities go to:

<http://www.jpl.nasa.gov>

Kennedy Space Center, Cocoa Beach, FL - May 22-25 -- From May 22-25, the Visitor Complex will host Discover Magazine, Star Trek, Fox 35 Kids and Cool 105.9 Day. These events will feature exhibits and appearances by former astronauts including Capt. Alan Bean, Dr. Ed Gibson, Col. Mike Mullane, Col. Buzz Aldrin, Capt. Gene Cernan, Cdr. Scott Carpenter, Capt. Wally Schirra, and Dr. Story Musgrave; as well as special character appearances; a scavenger hunt; and promotional giveaways. For more information please call 407/867-2363.

Goddard Space Flight Center, Greenbelt, MD - May 21 -- More than 100 fourth grade students will participate in variety of activities which include: Space Bingo; Send Your Name to Mars; Planet Garden; How to Calculate Your Age and Weight on Another Planet; Exploring Earth From Space; Cyber Space Day; 101 Reasons to Explore Space; and tours. For more details call 301/286-7031.

Johnson Space Center, Houston, TX - May 20 -- In anticipation of Space Day, the Challenger Center for Space Science Education will take fourth through eighth grade students on a special electronic field trip (EFT) that celebrates the human spirit of exploration. The event, will be broadcast via satellite, brings youngsters behind the scenes to witness first-hand how robotic, human and ground-based missions are used to unveil the mysteries of our universe.

More information on Space Day '98 activities can be found at the following URL:

www.spaceday.com

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

August 7, 1998

KSC Contact: George Diller

Note to Editors No. N98-51



NASA SCIENTISTS TO HOLD MEDIA BRIEFING ON UPCOMING HURRICANE RESEARCH

NASA researchers and two of the nation's leading hurricane scientists will brief the media on upcoming research to look into the nature of hurricanes and tropical storms. The briefing will be held at the press site of NASA's Kennedy Space Center, FL, on Wednesday, Aug. 12, at 1 p.m. EDT. With an aim to improve hurricane and tropical storm predictions on the ground and to better understand the nature of these weather systems, two NASA research aircraft will take to the skies -- collecting very high- altitude information above and in Atlantic storms.

Briefing participants will be:

Dr. Ramesh Kakar

Earth Science Program Manager, NASA Headquarters, Washington, DC

Ms. Robbie Hood

Lead Mission Scientist, Global Hydrology and Climate Center, Marshall Space Flight Center, Huntsville, AL

Dr. Ed Zipser

Tropical Rainfall Measuring Mission, Field Campaign Lead, Texas A&M University, College Station, TX

Dr. Frank Marks

Field Program Director, Hurricane Research Division, National Oceanic and Atmospheric Administration, Miami, FL

A tour of the two NASA Dryden Flight Research Center aircraft -- a DC-8 and ER-2 -- will be available to media on Aug. 12 at 3 p.m. EDT at Patrick Air Force Base, FL. Media wishing to tour the planes should report to the main gate of Patrick AFB to be escorted to the aircraft hangar.

Other organizations participating in the hurricane and tropical storm study will include:

- NASA's Ames Research Center, Moffett Field, CA
- NASA's Dryden Flight Research Center, Edwards, CA
- NASA's Goddard Space Flight Center, Greenbelt, MD
- NASA's Jet Propulsion Laboratory, Pasadena, CA
- NASA's Langley Research Center, Hampton, VA
- NASA's Wallops Flight Facility, Wallops Island, VA
- National Oceanic and Atmospheric Administration's Aircraft Operations

Center, MacDill Air Force Base, Tampa, FL

- Massachusetts Institute of Technology, Cambridge
- University of Wisconsin, Madison
- Texas A&M University, College Station
- University of Maryland, Baltimore

The briefing will be carried live on NASA TV with two-way question-and-answer capability for media covering the event from participating NASA Centers. NASA Television is broadcast on the GE-2 satellite, located on Transponder 9C, at 85 degrees West longitude, vertical polarization, frequency 3880.0 Mhz, audio 6.8 MHz.

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 15, 1998

KSC Contact: Bruce Buckingham

Release No. N98-56



Note to Editors:

GOING "ALL OUT" UNDER WATER

NASA's Life Sciences Division is sponsoring the Challenge Mission, a unique outreach event, from Sept. 23-30, 1998, in Key Largo, FL. The Challenge Mission is an eight-day deployment of the Scott Carpenter Space Analog Station on the sea floor off Key Largo. The station is a fully functioning, submersible habitat that serves as a demonstration analog setting for concepts and challenges of systems needed for human exploration of space.

Invited individuals and representatives of the Challenge Project museum and national organization partners will be joined by Space Life Sciences experts in the space analog station.

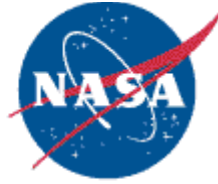
The list of official crew members includes former astronaut Buzz Aldrin, movie producer James Cameron, actress Kate Mulgrew, and Tom Whittaker, the first disabled person to summit Mt. Everest. Crew members will address their choices to stay physically and mentally active at every age and to continually strive to achieve their personal best, as exemplified by John Glenn, who will fly on the Space Shuttle (STS-95) in October.

The intergenerational crew, assembled from a broad spectrum of careers, lifestyles and accomplishments, will deliver live presentations twice daily during the Challenge Mission using Internet Webcasting technologies. Crew members will engage in a series of life sciences activities and dockside discussions, focusing on human aging, in keeping with the STS-95 mission, the first of a series of collaborations between NASA Life Sciences and the National Institute on Aging of the National Institutes of Health.

A complete listing of crew members and their biographies, daily Internet communications schedules, information about STS-95 life sciences investigations and related materials is available at: <http://quest.arc.nasa.gov/space/challenge>

For more information about participating in the Challenge Mission, please contact Jennifer McCarter, Public Affairs Specialist, NASA Headquarters, (Phone: 202/358-1639), or Bonnie McClain, Space Life Sciences Education Programs Coordinator, Colorado State University, Washington, DC, (Phone: 202/488-5123).

Go to the [KSC Press Releases](#) Home Page



JOHN F. KENNEDY SPACE CENTER

September 21, 1998

KSC Contact: George Diller/Lisa Malone

Release No. N98-59



Note to Editors:

LEONARDO MPLM TRANSFER CEREMONY AT KSC SEPT. 25

NASA Administrator Daniel S. Goldin and the President of the Italian Space Agency, Sergio De Julio, will meet at NASA's Kennedy Space Center, FL, on Friday, Sept. 25 for a ceremonial event transferring the "Leonardo" Multipurpose Logistics Module (MPLM) from the Italian Space Agency (ASI) to NASA.

The MPLM, a reusable logistics carrier, is the primary delivery system used to resupply the International Space Station (ISS) and return Station cargo requiring a pressurized environment. It is one of Italy's major contributions to the Station program. The cylindrical module is approximately 21 feet long, 15 feet in diameter, and weighs almost 4.5 tons.

Leonardo will be carried to the International Space Station aboard the Space Shuttle and will be temporarily docked to the Station once on orbit, providing a working environment for two crew members. It can carry up to 20,000 pounds of supplies, science experiments, spare parts and other logistical components for ISS.

A ceremonial signing of a document signifying the transfer of Leonardo, the first of three MPLM carriers, will be held at the International Space Station Center, located adjacent to the Space Station Processing Facility at KSC. This activity will begin at 11 a.m. on Friday, Sept. 25. Participating in the ceremony will be:

- Daniel S. Goldin, NASA Administrator
- Sergio De Julio, President, Italian Space Agency
- Roy D. Bridges, Director, Kennedy Space Center

At noon, media will be escorted to the Space Station Processing Facility to see Leonardo and for a photo/interview opportunity. Available will be:

- Daniel S. Goldin, NASA Administrator
- Sergio De Julio, President, Italian Space Agency
- Roy D. Bridges, Director, Kennedy Space Center
- Joseph H. Rothenberg, NASA Associate Administrator for Space Flight
- Gretchen W. McClain, NASA Deputy Associate Administrator for Space Development
- John D. Schumacher, NASA Associate Administrator of External Relations
- Randy Brinkley, NASA International Space Station Program Manager
- Giovanni Rum, Advisor to the ASI President
- Silvana Rabbia, ASI MPLM Program Manager

- Giuseppe Viriglio, Head, Alenia Aerospazio Space Division
- Saverio Liroy, Head, Alenia Space Infrastructure Program
 - Royce Mitchell, Boeing Deputy Program Manager for International Space Station

Astronauts Chris Hadfield and Robert Curbeam, members of the Space Shuttle crew that will launch Leonardo in late 1999, as well as Italian astronaut Umberto Guidoni, will be present.

Media representatives should be at the KSC Press Site at 10 a.m. for transportation to the International Space Station Center. Since media will later be taken inside the high bay of the Space Station Processing Facility, long pants and closed-toe shoes are required. No shorts or sandals are allowed. Also, no food, tobacco, lighters, matches or knives can be permitted inside the high bay. Media will be returned to the KSC Press Site by 1 p.m.

Those media needing accreditation should contact the NASA News Center at KSC at 407/867-2468 before the close of business, Thursday, Sept. 24.

Go to the [KSC Press Releases](#) Home Page
