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STS-121

Mission: International Space Station Assembly Flight ULF1.1

Space Shuttle: [Discovery](#)

Launch Pad: [39B](#)

Launched: July 4, 2006, 2:37:55 p.m. EDT

Landing Site: Kennedy Space Center, Fla.

Landing: July 17, 2006, 9:15:49 a.m. EDT

Runway: 15

Revolution: 202

Mission Duration: 12 days, 18 hours, 37 minutes and 54 seconds

Main Gear Touchdown: 9:14:43 a.m. EDT

Nose Gear Touchdown: 9:14:53 a.m. EDT

Wheel Stop: 9:15:49 a.m. EDT

Rollout Distance: 4.2 miles

Miles Traveled: 5.3 million

Crew Members:



Image above: STS-121 crew portrait with Mission Specialists [Stephanie D. Wilson](#) and [Michael E. Fossum](#), Commander [Steven W. Lindsey](#), Mission Specialist [Piers J. Sellers](#), Pilot [Mark E. Kelly](#), and Mission Specialists [Thomas Reiter](#) and [Lisa M. Nowak](#).

Image Credit: NASA

Launch:



Space Shuttle Discovery rockets into the clear blue sky, creating its own fireworks display. History was made with the first ever launch on Independence Day. Image courtesy of Nikon/Scott Andrews.

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July 4, 2006, at 2:38 p.m. EDT. Launch of Discovery was scrubbed twice, July 1 and 2, due to weather concerns. After a day's standdown, the launch attempt resumed on July 4 and Discovery lifted off on time.

Landing:



The orbiter Discovery touches down on Runway 15 at NASA's Shuttle Landing Facility, completing mission STS-121 to the International Space Station. Image credit: NASA/Tony Gray and Tim Powers

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July 17, 2006, at 9:15 a.m. EDT. Runway 15 at Kennedy Space Center. Main gear touchdown: 9:14:43 a.m. Nose gear touchdown: 9:14:53 a.m. Wheel stop: 9:15:49 a.m. Rollout distance: 4.2 miles. Mission duration: 12 days, 18 hours, 37 minutes and 54 seconds. Logged 5.3 million miles. Landed on first opportunity at Kennedy, marking the 62nd landing at the center.

Mission Highlights:



STS-121 was the second return-to-flight mission, demonstrating techniques for inspecting and protecting the shuttle's thermal protection system and replacing critical hardware needed for future station assembly. The mission also restored the station to a three-person crew for the first time since May 2003, leaving ESA astronaut Reiter aboard to join Expedition 13.

This was the most photographed shuttle mission in history, with more than 100 high-definition, digital, video and film cameras documenting the launch and climb to orbit. The images helped assess any damage sustained and potential risk for landing. In addition, the crew used the orbiter boom sensor system with a laser dynamic range imager, laser camera system and intensified television camera on the end, to examine the shuttle's nose cap, port wing, leading edge of the starboard wing, and outside of the crew cabin. No risk was found.

After docking to the station, the crew transferred the multi-purpose logistics module Leonardo to the Unity module from which they moved 7,400 pounds of supplies and equipment during their stay. The cargo included a new heat exchange for the common cabin air assembly that collects condensation out of the air on the station, a new window and window seals for the Microgravity Sciences Glovebox, and a spare U.S. extravehicular activity suit and emergency jet pack.

Astronauts performed three spacewalks:

- EVA No. 1 -- 7 hours, 31 minutes. Mission Specialists Piers Sellers and Michael Fossum installed a blade blocker on the S0 truss in the zenith interface umbilical assembly to protect the undamaged power, data and video cable. They rerouted the cable through the IUA in order to move the mobile transporter rail car and replace the trailing umbilical system with the severed power and data cable. After that task, they tested the combination of the shuttle robotic arm and OBSS as a platform for spacewalking astronauts to repair a damaged orbiter if ever needed. The EVA was the fourth for Sellers and first for Fossum.
- EVA. No. 2 -- 6 hours, 47 minutes. Sellers and Fossum restored the station's mobile transporter car to full operation, replacing the nadir-side trailing umbilical system, including a new interface umbilical assembly without a blade (the previous IUA had a blade, which inadvertently cut the cable that required the replacement). During the spacewalk, Fossum's emergency jet thruster backpack came loose on one side, requiring Sellers to secure it.
- EVA No. 3 -- 7 hours, 11 minutes. The third and final spacewalk focused on testing repairs on thermal

protection system reinforced carbon-carbon panels. Under evaluation was a pre-ceramic polymer sealant containing carbon-silicon carbide powder known as NOAX for use on damaged panels. Sellers and Fossum made three gouge repairs and two crack repairs. They also photographed the samples, as well as an area of Discovery's port wing. An added task during the EVA was removing the fixed grapple bar on the integrated cargo carrier in Discovery's payload bay and installing it on an ammonia tank inside the station's S1 truss to facilitate moving the tank on a later mission.

Refilled with 4,600 pounds of experiment samples, broken equipment and trash to be returned to Earth, Leonardo was moved back to Discovery's payload bay.

The return flight to Earth was delayed one day in order to add the third spacewalk. The mission management team determined there were enough consumables to extend the mission to test repair techniques and test a thermal imaging camera.

The trip home was one crew member short. Reiter remained behind to join Expedition 13, marking the first time since May 2003 that the station houses three crew members.

After unberthing from the station, the shuttle crew again used the robotic arm and boom sensors to inspect the starboard wing and nose cap heat shield. Still no concerns were noted.

NASA's John F. Kennedy Space Center

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