

STS-121

The on-orbit testing of new equipment and repair procedures for space shuttles will continue when mission STS-121 visits the International Space Station.



STS-121, the second mission in the Return to Flight sequence, will carry on demonstrations of safety improvements that debuted on the first Return to Flight mission, STS-114, and build upon those tests. STS-114 launched in July 2005 and was the first shuttle mission to fly since the loss of *Columbia* and the STS-107 crew on Feb. 1, 2003.

STS-121 also will deliver critical hardware and a new crew member to the space station, bringing the orbital outpost's crew complement back to three.

STS-121 will begin its journey to the space station when *Discovery* lifts off from NASA's Kennedy Space Center in Florida. After entering orbit, the crew will spend about 48 hours preparing for its arrival at the station and conducting inspections of the shuttle's heat shield with a 50-foot-long orbiter boom sensor system (OBSS).

After docking with the space station on flight day 3, the STS-121 crew members will conduct joint

operations with the station's crew. Activities will include cargo transfers and two spacewalks.

During STS-121, mission managers expect to evaluate the high probability of shuttle consumables supporting an extra day for the mission. If an extra day is available, the crew and flight control team are training for a third spacewalk.

Additional inspections of the shuttle's heat shield with the OBSS are scheduled near the end of the mission, on the day before and the day of undocking from the space station.

Discovery is slated to undock from the station on flight day 11 and land at Kennedy's Shuttle Landing Facility on flight day 13. STS-121 will be the 115th shuttle mission and *Discovery's* 32nd flight. Also, it will be the 18th space shuttle mission to visit the space station.

The Crew

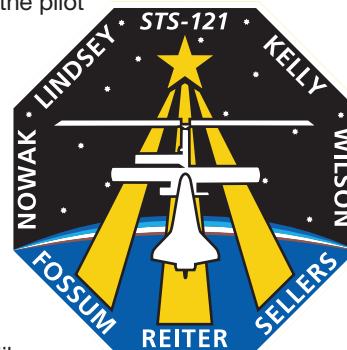
STS-121's crew is a mixture of veteran and first time space travelers. Leading the STS-121 crew is veteran astronaut Steven Lindsey, a colonel in the U.S. Air Force. He served as the pilot for STS-87 in 1997 and STS-95 in 1998. Lindsey commanded his first shuttle flight when STS-104 flew to the station in 2001.

The pilot is Mark Kelly, who will make his second trip to the station. Kelly, a commander in the U.S. Navy, served as the pilot of STS-108 in 2001.

Mission Specialist Piers Sellers, who holds a doctorate in biometeorology, will make his second flight into space. Sellers served as a mission specialist on STS-112 in 2002.

Mission Specialists Mike Fossum, Stephanie Wilson and Lisa Nowak will make their first spaceflight on STS-121. Wilson and Fossum worked for NASA before joining the astronaut corps. Nowak came to NASA from the Navy, where she holds the rank of commander.

Flying to the station with STS-121 is European Space Agency astronaut Thomas Reiter.



NASAfacts



When *Discovery* leaves the station, Reiter will stay behind to work under an agreement between the European Space Agency and the Russian Federal Space Agency. Reiter will give the station a three-member crew for the first time since Expedition Six returned to Earth in May 2003. He will also be the first European Space Agency astronaut to live aboard the International Space Station for a long-term mission.

Without the space shuttle to ferry equipment to the station after the *Columbia* accident, only two people could be supported onboard until the necessary provisions were in place.

The STS-121 crew members are scheduled to perform two spacewalks to test on-orbit inspection and repair techniques for the shuttle's heat shield, perform station maintenance and install spare parts for future use on station. Sellers and Fossum will perform the excursions. Sellers accumulated 19 hours and 41 minutes of spacewalking time during three STS-112 extravehicular activities. Fossum will conduct his first spacewalks.

STS-121's spacewalks will be performed from the station's airlock while the shuttle is docked to the complex. During the first spacewalk, Sellers and Fossum will test a 50-foot robotic arm boom extension as a heat shield repair and inspection platform.



They will also begin maintenance of the station's mobile transporter (MT) by safing or replacing a cable cutter unit to allow the station's mobile robotic system to be translated in support of the second spacewalk.

During the second spacewalk, the crew will replace a detached cable on the MT, which was inadvertently cut, and its reel assembly. They will also contribute to the construction of the space station by installing a spare part for the station's thermal control system for future use.

If consumables and time allow for the third spacewalk it will include tasks to test techniques for inspecting and repairing the reinforced carbon-carbon (RCC) segments that protect the shuttle's nose cone and wing leading edges. The inspections will be done with an infrared camera and the crew will use special sealants to repair simulated RCC segments in *Discovery*'s payload bay.

Cargo

In addition to a new crew member, *Discovery* will deliver supplies and equipment to the station. More than two tons of cargo will make the trip to the station inside NASA's Italian-built multi-purpose logistics module known as Leonardo. This pressurized cargo compartment will ride in the space shuttle's payload bay along with the spare parts for the station.



On flight day 4, the station's robot arm will lift Leonardo from the payload bay and attach it to the station's Unity connecting module. Then, the station and shuttle crews will spend the next several days unloading the cargo and refilling Leonardo with equipment and experiments that will return to Earth. The robot arm will return Leonardo to the payload bay before *Discovery* undocks. STS-121 will be Leonardo's fourth trip to the station.

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