



STS-122: The Voyage of Columbus



Space Shuttle *Atlantis*' next voyage, STS-122, will increase the science capabilities of the International Space Station (ISS) with the delivery of the European Space Agency built Columbus Research Module.

During the mission, known as ISS Assembly Flight 1E, the shuttle crew will conduct three spacewalks to install Columbus on the orbital outpost. STS-122 will also deliver a new Expedition crew member to the station.

The Crew

Veteran astronaut Steve Frick is the STS-122 commander. Frick, a commander in the U.S. Navy, first flew to space in 2002 as the pilot of STS-110. He is responsible for overall mission and flight operations.

STS-122's pilot is Navy Commander Alan Poindexter, a first time space traveler. He also will serve as the mission's spacewalk coordinator and will undock *Atlantis* from the station.

Six astronauts will serve as mission specialists on STS-122 – Leland Melvin, U.S. Air Force Col. Rex Walheim, Stanley Love, Daniel Tani and ESA astronauts French Air Force Gen. Léopold Eyharts and Hans Schlegel. Eyharts will join the Expedition 16 crew replacing Tani, who will return to Earth on *Atlantis*.

Tani arrived at the ISS in October with STS-120. His previous space flight occurred in 2001 on STS-108. Tani has conducted three spacewalks since launching on STS-120.

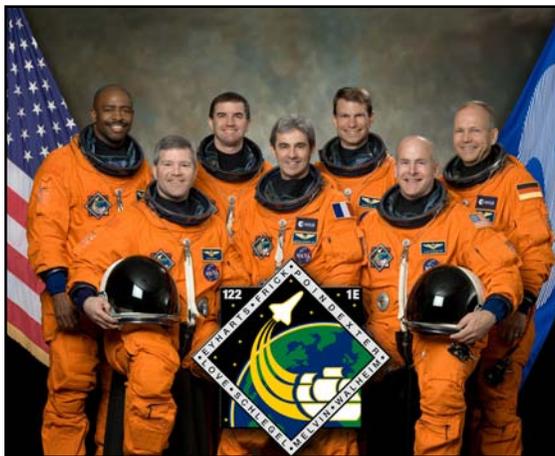
Eyharts spent more than 20 days in orbit aboard the Russian Mir space station in 1998. He is scheduled to stay on the ISS until February 2008 when he will return to Earth with STS-123.

Melvin will be making his first space flight on STS-122. He will be the primary operator of the space station robotic arm – Canadarm2 – and will use the shuttle robotic arm to inspect *Atlantis*' heat shield.

Walheim first flew to space with Frick on STS-110, during which he conducted two spacewalks to install the S0 truss segment. Walheim is the lead spacewalker for STS-122's excursions.

STS-122 will be Schlegel's second space flight. His first flight was on STS-55 in 1993. Schlegel is scheduled to conduct STS-122's first two spacewalks with Walheim.

Love will be making his first trip into space when *Atlantis* launches. Love will conduct the third spacewalk with Walheim and operate Canadarm2 with Melvin during the first two spacewalks.



From the left (front row): Frick, Eyharts, and Poindexter, (back row): Melvin, Walheim, Love and Schlegel.



Columbus Installation and Spacewalks

The main objective of flight day 4's spacewalk is the installation of Columbus onto the station. The spacewalkers will assist robotic arm operators in attaching Columbus and make power and data connections.

Also on flight day 4, Eyharts will officially become a member of the Expedition 16 crew when his custom-made seatliner replaces Tani's seatliner in the Russian Soyuz spacecraft that serves as an emergency escape vehicle on the station.

Columbus Research Module

Columbus is ESA's largest contribution to the on-orbit construction of the space station and is named after the famous explorer Christopher Columbus. The cylindrical shaped Columbus is 22.6 feet (6.9-meters) long and 14.7 feet (4.5-meters) wide. It has a volume of 2,648.6 cubic feet (75 cubic meters) and will be permanently attached to the U.S. Harmony connecting module's starboard port.

The new module is a multifunctional, pressurized laboratory that will support scientific and technological research in a microgravity environment, as well as perform a number of technological applications. Research areas include fluid physics, materials science and biosciences. Columbus also has an external facility that will host space science, Earth observation, and technology experiments and applications in the vacuum of space.

Launch and Docking

STS-122 is scheduled to be an 11-day mission, beginning with a liftoff from Kennedy Space Center, Fla. During the first full day in space, the STS-122 crew will inspect *Atlantis'* heat shield and prepare for rendezvous and docking with the space station.

Before *Atlantis* links up with the station on flight day 3, Frick will maneuver the orbiter in a backflip that will allow the Expedition 16 crew to collect imagery of the shuttle's heat shield.

After docking and the hatch opening, the STS-122 crew will be greeted by the station's Expedition 16 Commander Peggy Whitson, Flight Engineer Yuri Malenchenko and Tani. The two crews will quickly begin joint operations, which include preparations for STS-122's first spacewalk.

The two crews continue activating Columbus on flight day 5, with Expedition 16 crew members scheduled to enter the new laboratory for the first time. If needed, the shuttle astronauts will conduct a focused inspection of the orbiter's heat shield.

The mission's second spacewalk is scheduled to take place on flight day 6. The spacewalkers' major objective is the replacement of the Nitrogen Tank Assembly on the station. Meanwhile, crew members will continue the internal outfitting of Columbus.

After a relatively light flight day 7, the STS-122 crew will conduct the mission's final scheduled spacewalk on flight day 8. The spacewalkers will attach science facilities to Columbus' exterior and transfer a failed Control Moment Gyroscope from its storage location on the station to the shuttle.

The two crews will wrap up joint operations and close the hatches late on flight day 9.

Undocking and Landing

Atlantis and the STS-122 crew will leave the station on flight day 10. Before beginning the trip home, Poindexter will guide the shuttle through a fly around of the station so the STS-122 astronauts can collect photographs and video of the orbital outpost in its new configuration. Later in the day, the STS-122 crew will conduct a final inspection of *Atlantis'* heat shield.

On the next day, the crew will make preparations for landing. Touchdown is scheduled to take place on flight day 12 at Kennedy.

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