National Aeronautics and Space Administration

NASAfacts

STS-117 (21st Space Station Flight)

NASA's STS-117 mission will continue the important task of completing construction of the International Space Station. During the 11-day mission, Atlantis will dock to the station and crewmembers will perform three spacewalks. STS-117 is the 118th space shuttle flight and 21st flight to the station.

The crew will deliver solar arrays, batteries and the S3/S4 integrated truss segment. The segment will be installed to the S1 truss on the starboard side of the station. Together, the S3/S4 segments are 45.3 feet long and weigh 35,581 pounds, making this the heaviest station element in existence. The integrated segment is the third of four power modules that provide additional power-generation capability for station.

The S3 segment includes the solar alpha rotary joint, which is the largest mechanism on the segment. The joint fosters the primary function of the segment: rotating the entire truss structure outboard, including two solar arrays on the S4 segment and eventually two solar arrays on the S6 segment. This rotation keeps the surface of the arrays pointing at the sun for optimal power generation. The S3 segment also comprises four payload attach system platforms.

The S4 segment's upper and lower decks each have a separate station power channel. These channels each include a solar array, six batteries, three battery charge/discharge units and other electronics which generate, store, regulate and distribute power to the station. The S4 segment also includes a large photovoltaic radiator and two thermal cooling loops filled with ammonia for each deck. This system dissipates the heat that accumulates during power storage and distribution, keeping the various electronic components cool.

During the first spacewalk, crew members will mate the S3/S4 truss segment and begin powering it.

The second spacewalk includes removing the restraints that kept the truss structure rigid during launch, thus allowing the S3 joint to rotate. The crew will perform various tasks during the third spacewalk, including completing the retraction of the solar arrays and installing the oxygen generation system hydrogen vent. If necessary to complete mission objectives, there are enough provisions for three additional spacewalks.

The Crew

A veteran of two spaceflights and a U.S. Marine colonel, **Frederick "Rick" Sturckow** is the commander of STS-117. He flew aboard Endeavour for the STS-88 mission in 1998. It was the first International Space Station assembly mission. In 2001, he was an STS-105 crewmember, making his way to the station aboard Discovery. NASA selected him in 1994 and he reported to Johnson Space Center in 1995. After a year of training, Sturckow worked for the Vehicle Systems and Operations Branch of the Astronaut Office. His most recent roles include deputy for the Shuttle Operations Branch, chief of the Astronaut Office CapCom (Capsule Communicator) Branch, and lead for KSC Operations Support. He has logged more than 4,790 flight hours and has flown more than 50 different aircraft.

Sturckow was born in La Mesa, Calif., but considers Lakeside, Calif., his hometown. He holds a Bachelor of Science degree in mechanical engineering from California Polytechnic State University.

Lee Archambault will pilot Atlantis during his first spaceflight. Selected by NASA in 1998, he has worked on flight instrument upgrades that were incorporated into the space shuttle in 2003. Archambault also served as an astronaut support person for launch and landing operations at Kennedy Space Center. In 2004, he acquired duties as a CapCom.

He earned Bachelor and Master of Science degrees in aeronautical/astronautical engineering from the University of Illinois-Urbana. He has logged more than 4,250 flight hours in more than 30 different aircraft, and is also a U.S. Air Force colonel. Born in Oak Park, Ill., Archambault considers Bellwood, Ill., his hometown.

A veteran of two spaceflights, **James Reilly** is a mission specialist for STS-117. He was a crewmember of STS-89, the eighth shuttle-Mir docking mission, and STS-104, the ninth station assembly flight. He has logged more than 517 hours in space, including three spacewalks. NASA selected Reilly in 1994 and he reported to Johnson Space Center in 1995. Initially, he managed technical issues for the Astronaut Office Computer Support Branch, then served as Astronaut Office lead on shuttle training. Reilly's most recent duties include serving as lead of Payloads and Procedures Operations for the Astronaut Office International Space Station Branch.

He has Bachelor, Master and Doctorate of Science degrees in geosciences from the University of Texas at Dallas. Reilly was born at Mountain Home Air Force Base, Idaho. He considers Mesquite, Texas, his hometown.

Steven Swanson will serve as a mission specialist on his first spaceflight. In 1987, he joined NASA as a systems engineer with Johnson Space Center's Aircraft Operations Division working on the shuttle training aircraft, an airborne shuttle simulator. In 1998, Swanson was selected as an astronaut candidate. He has also worked in the Astronaut Office's Space Station Operations and Robotics Branches, and served as a CapCom.

He has a Bachelor of Science degree in engineering physics from the University of Colorado, a Master of Applied Science in computer systems from Florida Atlantic University and a doctorate in computer science from Texas A&M University. Swanson was born in Syracuse, N.Y., but considers Steamboat Springs, Colo., his hometown.

A veteran of one spaceflight, **Patrick Forrester** is a mission specialist on STS-117. He flew on STS-105 in 2001, the 11th mission to the station. He was assigned to the Johnson Space Center as an aerospace engineer in 1993. Forrester has also served as the crew representative for robotics development for the station. He was selected as an astronaut candidate in 1996. Forrester later became a member of the astronaut support team at Kennedy Space Center, the technical assistant to the director of Flight Crew Operations, the shuttle training and on-board crew procedures representative, and a CapCom. He has logged more than 285 hours in space, including two spacewalks. As a master Army aviator, he has logged more than 3,900 hours in more than 50 different aircraft.

Forrester received a Bachelor of Science degree in applied sciences and engineering from the U.S. Military Academy at West Point in New York, and a Master of Science degree in mechanical and aerospace engineering from the University of Virginia. He was born in El Paso, Texas.

John "Danny" Olivas will serve as a mission specialist on his first spaceflight. Since NASA selected him in 1998, he became lead for the special-purpose dexterous manipulator robot and the mobile transporter, and supported the research effort focused on developing materials, tools and techniques to perform on-orbit shuttle repair. Olivas most recently served as lead of the Hardware Integration Section of the Space Station Branch. He has also served as program manager of the JPL Advanced Interconnect and Manufacturing Assurance Program.

Olivas earned a Bachelor of Science degree in mechanical engineering from the University of Texas at El Paso, a Master of Science degree in mechanical engineering from the University of Houston, and a doctorate in mechanical engineering and materials science from Rice University in Texas. He was born in North Hollywood, Calif., but raised in El Paso.

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