Mission Overview

ESA astronaut Thomas Reiter from Germany will be the first European to undertake a long-duration mission on the International Space Station (ISS) when he is launched on the STS-121 Discovery

Launch of Space Shuttle Discovery on STS-114 mission on 26 July 2005 (Image: NASA)

mission currently scheduled in July. The mission, which is due to last five months, will mark many important milestones for the European Space Agency, European astronauts, European science and European control centres. The focal points of the mission are as follows:

First ESA astronaut to become a member of an ISS Expedition Crew: Two days after arriving at the ISS Reiter will take over his duties as Flight Engineer 2 for the Expedition 13 Crew. As the first European to become the member of an Expedition Crew, Reiter will be undertaking many vital tasks on the ISS that could cover the use of systems and procedures for: ISS guidance and control, environmental control and life support systems, crew health and safety, and EVA operations to name a few. For the second half of his mission he will take on the same role as a member of the Expedition 14 Crew when they arrive in September 2006. As well as being the first European Expedition Crew member, Reiter will also be the first German to visit the ISS.

First ESA astronaut to undertake an EVA from the ISS: Reiter's knowledge on EVA operations will be called upon soon after arrival at the ISS as he is currently scheduled to become the first ESA astronaut to undertake an EVA from the ISS in July. Reiter previously undertook two EVAs on the Mir Space Station during the 179-day ESA-Russian Euromir 95 mission from 3 September 1995 until 29 February 1996.

ESA astronaut Thomas Reiter during EVA training in May 2003 at NASA's Sonny Carter Training Facility Neutral Buoyancy Laboratory. (Credit: NASA)

First long-duration European Experiment Programme on the ISS: For Reiter's mission it is the first time that a European scientific programme has been assembled that is tailored to a long-duration mission on the ISS. The scientific programme, which has come predominantly from scientific institutions across Europe will cover the areas of human physiology, complex plasma physics, and radiation dosimetry. Further activities will centre on technology demonstrations, industrial experiments and education.

Delivery and commissioning of European experiment facilities: The STS-121 flight will bring three ESA-developed experiment facilities and devices to the ISS: the Minus 80 degrees Laboratory Freezer for the ISS (MELFI), the European Modular Cultivation System (EMCS) and the Percutaneous Electrical Muscle Stimulator (PEMS). EMCS and this flight unit of MELFI were developed by the European Space

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Agency for NASA in the framework of international barter agreements. Reiter will be taking part in the commissioning of EMCS, MELFI and PEMS along with the Pulmonary Function System, an ESA facility already on the ISS. These will be brought to the ISS in the European-developed Multipurpose Logistics Module (MPLM) a pressurised cargo container that travels in the space shuttle's cargo bay.

European-built Multi-Purpose Logistics Module 'Leonardo' in Discovery's cargo bay during STS-102 mission. 10 March 2001 (Image: NASA)

Return to a three member ISS Crew: The arrival of Reiter at the ISS will mark the return from a two-member to a three-member ISS Expedition Crew. There has not been a three-member crew for three years in connection with the Columbia accident in February 2003. The other Expedition 13 Crew members, Roscosmos cosmonaut and ISS Commander Pavel Vinogradov and NASA astronaut and ISS Flight Engineer Jeffrey Williams, arrived at the ISS on Soyuz flight 12S on 1 April. The return to a three-man crew will increase the time available for the crew to carry out scientific research.

The ISS Expedition 6 Crew, Donald Pettit, left, Kenneth Bowersox, centre and Nikolai Budarin, right. The last Expedition Crew consisting of three crew members (Image: NASA)

First European Control Centre for long-duration ISS mission: On the control side of the mission this will be the first time that there is a European Control Centre for a long–duration human spaceflight mission to the ISS. This will be based at the Columbus Control Centre, at the DLR facility in Oberpfaffenhofen near Munich, Germany. The control centre will be the hub of

The Columbus Control Centre in Oberpfaffenhofen near Munich (Image: DLR)

European activity during this mission, monitoring and coordinating the activities of Reiter, coordinating with the Mission Control Centres in Houston and Moscow, and coordinating with the European Astronaut Centre in Cologne and various User Support and Operations Centres throughout Europe. The mission will provide Europe with invaluable experience of long-term scientific utilisation of the ISS in advance of the launch of the European Columbus Laboratory, scheduled for 2007. The Columbus Control

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Centre, which is run for ESA by the German Aerospace Centre (DLR) is already supporting mission preparation and mission simulations from its control rooms.

ESA astronaut Thomas Reiter prior to launch of the Euromir mission on 3 september 1995

Additional information

European astronaut with most cumulative time in space: 30 days after arriving at the ISS, Reiter will become the European with the most cumulative time in space, surpassing the mark of former ESA astronaut Jean-Pierre Haigneré who served 209 days in space over two missions including the 189-day ESA/CNES Perseus mission to the Russian space station Mir in 1999. By the end of the mission Reiter may in fact be one of the select group of astronauts who has served more than one year in space.

Backup ESA astronaut: ESA astronaut Léoplold Eyharts from France is the backup ESA astronaut for the mission and has followed the same training programme as Thomas Reiter. As such Eyharts is similarly prepared to carry out the mission. Furthermore it provides excellent preparation for his tasks as prime astronaut for a future ESA mission to the ISS in connection with the Columbus laboratory. Eyharts previously flew to the Russian space station Mir as a CNES astronaut on the Pégase mission (29 January – 19 February 1998) before joining the European Astronaut Corps in August 1998.

ESA astronaut Léopold Eyharts during trining in Houston
(Image: ESA)

Return Flight: Thomas Reiter is currently scheduled to return to Earth with the STS-116 Shuttle flight in December. This flight includes ESA astronaut Christer Fuglesang from Sweden who will be a member of the Shuttle Crew on an ISS assembly mission.

Agreements: The mission is covered by an agreement between ESA and the Russian Federal Space Agency (Roscosmos). The agreement, which covers the ESA astronaut's flight in a crew position originally planned for a Russian cosmonaut, is further supported by a tri-lateral understanding between ESA, Roscosmos and NASA.

Mission Name and Logo

The name of the mission, Astrolab, was chosen in memory of Martin Behaim (1459-1507), a famous German cartographer, mapmaker, navigator and explorer, who is famous for making developments in the Astrolabe.

This important navigation instrument was a great improvement on the primitive quadrant then in use for taking the altitude of the sun. The device was used in order to determine location, distance and time. It was this new Astrolabe that Columbus used as a navigation aid on his way to the New World.

ASTROLAB also refers to ASTROnauts and to LABoratory. This name suggests that this first long duration mission, of a European astronaut on the ISS is describing the navigation path for the utilisation of the Columbus Laboratory in future exploration.

The principal form in the logo comes from two circles, with the outermost circle split into 24 sections. This describes the form of an astrolabe. The border of the innermost circle takes its colours from the German flag, highlighting the origin of ESA astronaut Thomas Reiter.

The International Space Station is shown as a central symbol in the logo, indicating the destination of the long-duration mission to the ISS. This is framed by two different sets of stars. The three bright stars to the left represent the three members of the ISS Expedition Crew. The 17 background stars represent the ESA Member States.