

Mission Overview

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In May 2009 ESA astronaut Frank De Winne will be launched into orbit in the Soyuz TMA-15 spacecraft, to embark on the 6-month OasISS mission to the ISS. Not only will de Winne become a member of the first six-person ISS Expedition Crew, he will also become the first European to become the commander of the International Space Station.

For De Winne, who is a member of the European Astronaut Corps, this will be his second mission to the Station on behalf of ESA following on from the 12-day Odissea mission in 2002.



ESA astronaut Frank De Winne (centre) prior to launch aboard the Soyuz TMA-1 spacecraft in 2002 as part of the Odissea mission. The other Soyuz crew members pictured are Russian cosmonauts Yuri Lonchakov (top) and Sergei Zaletin (bottom). (Image: ESA)

The mission will mark many important milestones for the European Space Agency, European astronauts, European science and European control centres as well as holding a great deal of significance for the European Space Agency in cooperation with its international partners. Not only will these milestones be of great importance in

fulfilling the goals of the mission, they will also hold great significance by building on current knowledge and experience for future exploration missions.



Soyuz launcher on the launch pad at the Baikonur Cosmodrome on 28 October 2002 prior to launch of the Odissea mission with ESA astronaut Frank De Winne and the other crew members of Soyuz TMA-1. (Image: Energia)

The focal points of the mission are as follows:

Launch and Crew of Soyuz TMA-15

De Winne will be launched into orbit aboard the Soyuz TMA-15 spacecraft on flight 19S to the ISS together with fellow ISS Expedition crew members: Canadian Space Agency astronaut Robert Thirsk and Russian cosmonaut Roman Romanenko. The launch is currently scheduled to take place on 27 May from the Baikonur Cosmodrome in Kazakhstan. The Soyuz TMA-15 spacecraft will be put into its initial orbit by a Soyuz FG launcher.



ESA astronaut Frank De Winne (right) with Expedition 20/21 flight engineers Nicole Stott (middle), who will travel to the ISS on STS-128 currently scheduled for August, and Robert Thirsk (left), taking part in a simulation training session at NASA's Johnson Space Center. (Image: NASA)

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First six-member ISS Crew: The arrival of De Winne and the other two members of the Soyuz TMA-15 crew at the ISS will mark the first ever six-member ISS Expedition Crew, as they join the other three Expedition crewmembers that are already on the Station: Russian cosmonaut Gennady Padalka, NASA astronaut Michael Barratt and JAXA astronaut Koichi Wakata. Padalka and Barratt arrived at the ISS as Expedition 19 crew members on Soyuz TMA-14 on 28 March 2009. Wakata arrived at the ISS on Shuttle flight STS-119 on 17 March 2009. (See crew section for full crew configuration)

Until recently the ISS was only able to permanently support a permanent crew of three. However with the Station nearing completion and the delivery of new Environmental Control and Life Support Systems, together with support from logistics spacecraft, a six-member crew has now been made possible. These logistics spacecraft include the European Automated Transfer Vehicle (ATV), the Russian Progress spacecraft, the Japanese H-II Transfer Vehicle (due for its first launch during the OasISS Mission) and the Space Shuttle.



The European ATV is one of the vital logistics spacecraft, which will help support a six-person crew. Shown above is 'Jules Verne' the first ATV on 31 March 2008 during rendezvous and docking test manoeuvres with the ISS.
(Image: NASA)

The increase to a six-person crew will increase the time available for Frank De Winne and the rest of the crew to carry out important scientific and technological research in addition to their standard operational tasks. This is a visible sign of the increasing role that Europe is playing through ESA in human spaceflight and will provide a basis for future human exploration missions.



Current Expedition 19 crew on the ISS, who will become members of the six-person Expedition 20 Crew: ISS Commander Gennady Padalka (centre), and Flight Engineers Koichi Wakata (left) and Michael Barratt (right) on 4 April 2009.
(Image: NASA)

First European Commander of the International Space Station: After arriving at the ISS, De Winne from Belgium will initially assume the tasks of an ISS Flight Engineer as a member of the ISS Expedition 20 crew. This will make De Winne the 3rd ESA astronaut to be a member of an ISS Expedition crew after Thomas Reiter (Astrolab Mission, 4 July – 22 December 2006) and Léopold Eyharts (Columbus Mission, 7 February – 27 March 2008).



Frank De Winne becomes the third ESA astronaut to be a member of an ISS Expedition Crew following Thomas Reiter (pictured above with experiment hardware during the European Astrolab mission in 2006) and Léopold Eyharts.
(Image: NASA)

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In October De Winne will become commander of the ISS Expedition 21 Crew, taking over the responsibilities of commander from Russian cosmonaut and Expedition 20 commander Gennady Padalka.

In his function of ISS Commander, De Winne will be responsible, among other things, for conducting operations on the ISS, directing the activities of the ISS crewmembers as a single, integrated team, ensuring the safety of the crew and the protection of the ISS elements, equipment, and payloads. He is set to return in November 2009.

Undertake an extensive European Experiment Programme: During the OasISS mission the European programme of scientific experiments and technology demonstrations will make use of the internal and external scientific facilities of the ISS and especially of the European Columbus laboratory, which was attached to the ISS in February 2008. Many of these experiments will be undertaken by ESA astronaut Frank De Winne,



ESA astronaut Frank De Winne during experiment training at the European Astronaut Centre (EAC), in Cologne, Germany in October 2008. (Image: ESA)



The European Columbus laboratory on 18 February 2008 attached to the International Space Station. External experiment payloads EuTEF and SOLAR pictured at the top of the image. (Image: NASA)

with additional experiments undertaken by members of the ISS Expedition Crew and visiting crew members.

These scientific experiments and technology demonstrations have come predominantly from scientific institutions across Europe and have been specifically tailored to a long-duration mission on the ISS. This research programme will cover different areas including human physiology, biology, radiation dosimetry, exobiology, fluid physics and materials sciences. These include experiments that could hold benefits in Earth-based applications, as well as experiments that are relevant for future exploration missions.

Undertake an important programme of educational and promotional activities: ESA views education as a valuable aspect in its Human Spaceflight missions, helping to inspire

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the youth of today. Frank De Winne will be the prime focus of ESA's education activities during the mission. To this end he will be undertaking such activities as a live lesson from the ISS. As Frank is also a goodwill ambassador for UNICEF Belgium, this provides a great opportunity amongst other education activities during the mission for cooperation between ESA and UNICEF Belgium. This cooperation will be based on the common ground of water, and in support of UNICEF's water, sanitation and hygiene campaign (WASH). Water is not only one of the most important basic elements of life as we know it and therefore the most important thread to follow when searching for life in the universe but it is also a very important onboard resource for astronauts and spacecraft in orbit.



Frank De Winne on the large screen at the Mission Control Centre – Moscow during an in-flight call during the Odissea mission in November 2002. (Image: Benoni Audenaert)

First docking of the Japanese HTV - Robotic Arm Operations: Frank De Winne will be one of the two operators of the Station's robotic arm when it is used for docking the first Japanese H-II Transfer Vehicle (HTV-1), the Japanese logistics



Pressurized and Unpressurized Carrier Assembly of the Japanese HTV. (Image: JAXA)

spacecraft to the ISS, in September 2009. He will also be the main operator of the Japanese robotic arm, which will be used to transfer scientific payloads to the Japanese external payload facility outside of the Japanese Kibo Laboratory.



ESA astronauts Frank De Winne (left) and André Kuipers, (ESA's backup for the OasISS mission) during robotic arm training at the Tsukuba Space Center in Japan. (Image: ESA)

Attachment of Mini Research Module 2
During the OasISS mission the Russian Mini Research Module 2 will be transported and attached to the ISS. It will be put into orbit by a

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Soyuz-U launcher, attached to a modified Progress spacecraft. Unlike the name suggests the Mini Research Module 2 is principally a docking compartment and airlock similar to the Russian Pirs Docking Compartment, which is currently attached to the Station's Russian Zvezda Service Module. The new docking compartment will be attached to the docking port on Zvezda on the opposite side of where Pirs is attached. This new module will obviously be advantageous in light of increased Russian Soyuz/Progress launches due to an increase to a six-member crew.



The Pirs Docking Compartment Approaches the International Space Station prior to docking on 16 September 2001. (Image: NASA)

Increased experience for European Control Centres in light of future exploration missions beyond the ISS: In terms of mission control, ESA's Columbus Control Centre in Munich, which is operated by flight control teams from the German Space Operations Centre (DLR/GSOC) under the management of ESA mission directors, continues to increase Europe's experience in

long-duration human spaceflight missions to the ISS. The control centre will be the hub of European activity during this mission, monitoring and coordinating the activities of De Winne, 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 human spaceflight operations, which will be invaluable for planning future human exploration missions beyond low-Earth orbit.



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

Additional information

Agreements: De Winne's flight is covered under the ISS agreement with its international programme partners by which ESA are entitled to an 8.3% share in the Station resources (crew time, power etc.) following the attachment of the Columbus laboratory to the ISS. This allows ESA to send one European astronaut to the ISS for a six-month mission every two years.



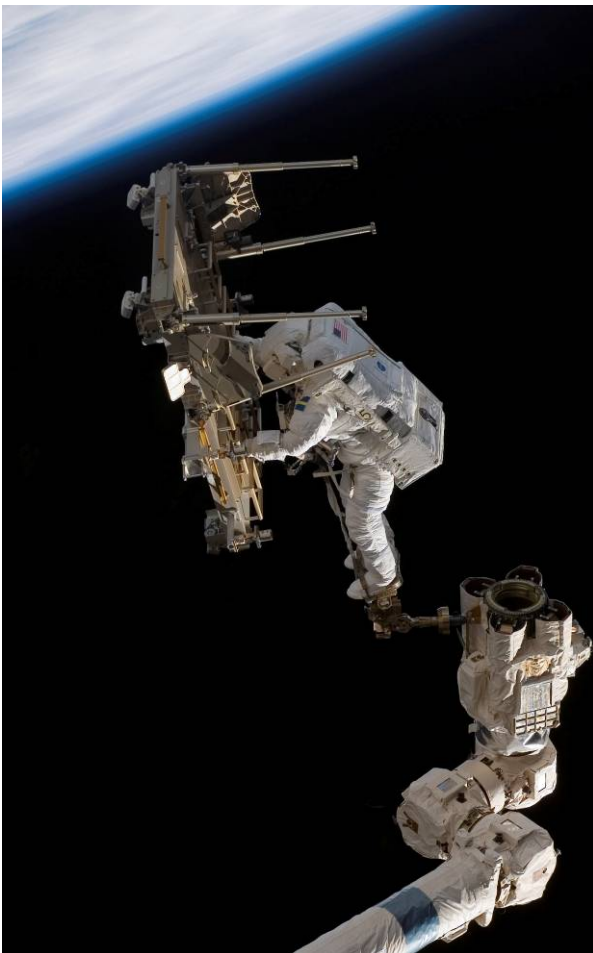
The International space Station in its current configuration as taken from Space Shuttle Discovery following undocking during the STS-119 mission on 25 March 2009. (Image: NASA)

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A majority of the European experiment programme is funded from the European programme for Life and Physical Sciences in Space (ELIPS).

Visiting ESA Astronaut

During the OasISS mission De Winne will be joined on board the ISS by Swedish ESA astronaut Christer Fuglesang, who will fly as a mission specialist on the 11-day STS-128 ISS assembly mission currently scheduled for launch in August 2009. As part of the mission Fuglesang will be undertaking spacewalks for ISS assembly as he also did in 2006 as a mission specialist on the Celsius/STS-116 mission.



ESA astronaut Christer Fuglesang during the second spacewalk of the STS-116 mission to the International Space Station. Fuglesang stands on a platform at the end of the Station's robotic arm. (Image: NASA)

Backup ESA astronaut: ESA astronaut André Kuipers from the Netherlands is the backup ESA astronaut for the OasISS mission and has followed the same training programme as Frank

De Winne. As such Kuipers is similarly prepared to carry out the mission. Kuipers previously flew to the ISS on the Delta mission in April 2004 on the Russian Soyuz TMA-4 spacecraft and spent 12 days in space during the mission.



ESA astronaut André Kuipers (right) carrying out experiment procedures on the ISS as part of the European DELTA mission on 22 April 2004 with the assistance of ISS Expedition 9 Commander Gennady Padalka. (Image: NASA)

Return Flight: Frank De Winne is scheduled to return to Earth with Roman Romanenko and Robert Thirsk aboard Soyuz TMA-15 in November 2009.

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The International space Station in its current configuration as taken from Space Shuttle Discovery following undocking during the STS-119 mission on 25 March 2009. (Image: NASA)

The name of the long-duration mission to the ISS was chosen by ESA from a total of 520 suggestions received in response to a competition launched by ESA's Directorate of Human Spaceflight in September 2008. These were received from people in all ESA Member States.

The winning name refers to many aspects of the International Space Station as well as to human exploration, ranging from the exploration of deserts on Earth by European explorers, to the deserts we will find on other planets, where humankind might be able set up an oasis and provide a permanent human outpost to live on that planet. The ISS itself can be considered an oasis in space for its astronauts and cosmonauts, whilst the Earth is often referred to as the Blue Planet and represents an oasis for humankind in the Universe. The name also refers to the challenge

to find an oasis, where human exploration is a challenge in itself.

OasISS also ties in with De Winne's role as a goodwill ambassador for UNICEF Belgium. In support of the UNICEF 2009 WASH campaign dedicated to water, sanitation and hygiene, several events will be implemented during his flight to draw public attention to the availability and cleanliness of water which is critically important for human life. As de Winne himself stated, "Water is a scarce resource on board the ISS; responsible use and recycling in space can help develop efficient water processing applications for Earth, which are particularly important for the developing countries".

The winning mission name, OasISS, was proposed by Jan Puylaert from Ghent, in Belgium.

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Mission Logo



OasISS Mission Logo (Image: AOES)

In addition to depicting the ISS and Earth as oases for astronauts and humankind, the mission logo features the theme of water as the basis of life as we know it.

Our planet is shown as a drop of water, resembling Earth as seen by the astronauts on the ISS. The importance of water for life is represented by the tree that grows out of the arms

of a man. He is rooted in the Station and its scientific utilisation. Water flows through the man's arms and the branches of the tree.

The rocket illustrates the Soyuz that will carry Frank De Winne to the ISS. A single white star symbolises how human exploration will eventually lead humankind to other planets.