

## Organisations and Industry



Mr Antonio Rodotà, ESA's former Director General (left) and Mr Sergio de Julio, former President of the Italian Space Agency (ASI) during the signing of the arrangement concerning Nodes 2 and 3 for the International Space Station (ISS) in Rome on 12 December 1997. (Image: ASI)

### **Node 2 Development**

The construction of Node 2 forms part of the Columbus launch agreement, a barter agreement signed between ESA and NASA on 8 October 1997 in Turin, Italy. Originally the European Columbus laboratory would have been launched on an Ariane 5 though downscaling of the laboratory and the cost saving influence of using the MPLM principal structure for Columbus led to the switch to a Shuttle launch.

Under this agreement, in exchange for NASA launching Columbus and its initial payload aboard the Space Shuttle, ESA would provide two of the Station's three Nodes (Node 2 and Node 3), spares and sustaining engineering for laboratory support equipment and additional hardware and services.

On 12 December 1997 ESA signed an agreement with ASI, which placed responsibility for developing Node 2 and Node 3 with ASI. Under this agreement, ESA entrusted ASI with the management, development and manufacture of the two Nodes, for which Alenia Aerospazio (now part of Thales Alenia Space) in Turin was the prime contractor, leading a consortium of European industrial companies.

This agreement enabled Europe to take full advantage of the experience gained by Italian industry through the development of the Multi-Purpose Logistics Modules (MPLMs) and synergies between the MPLMs, Nodes 2 and 3, and the European Columbus laboratory module, which all use the same structural concept. The ESA/ASI agreement has also fostered an

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increasing use of common subcontractors for the Node and Columbus electrical harnesses and Mechanical Ground Support Equipment (OHB in Germany) and thermal control subsystems (Microtecnica, Italy, part of Hamilton Sundstrand). Since 2004 ESA have taken over management of the European Nodes programme from ASI.



(Top): The first MPLM 'Leonardo' in the cargo bay of Shuttle Discovery, after docking with the ISS in March 2001 during the STS-102 mission. (Bottom) cosmonaut Yuri Gidzenko inside Leonardo during the same mission after the MPLM is taken out of the cargo bay and itself docked with the ISS. (Images: NASA)

The advantage of the barter agreements is that European industry has developed hardware for the Station using ESA funds, rather than ESA paying NASA in dollars for the Columbus launch. This helps to avoid the risk of price uncertainties and helps in the creation of additional industrial work for Europe in high-technology domains.

**Paolo Nespoli Flight**

Paolo Nespoli's mission will be carried out in the framework of a Memorandum of Understanding between the Italian Space Agency, ASI, and NASA. Under this agreement ASI would supply NASA with three Multi-Purpose Logistic Modules (MPLMs): pressurised cargo containers that are transported to the ISS in the Shuttle's cargo bay, in return for the assignment to Italy of six flight opportunities and ISS utilisation resources. The six flight opportunities include three short-term missions to the ISS and three longer-term missions of which the Nespoli flight is the second short-term mission. The first short-term mission falling under this agreement was the flight of former ESA astronaut Umberto Guidoni on the STS-100 mission, which brought Guidoni as the first ESA astronaut to the ISS. The cargo on this mission included an MPLM as well as the Station's robotic arm.



Former ESA astronaut Umberto Guidoni checks equipment and supplies on the mid deck of the Space Shuttle Endeavour on 21 April 2001 prior to docking with the ISS on the STS-100 mission. (Image: NASA)

ESA has an agreement with ASI allowing ESA astronaut Nespoli to fly on this mission and undertaking activities both for the European Space Agency and the Italian Space Agency. The agreement signed on 19 June 2007 at the Paris Air Show in Le Bourget between ESA's Director of Human Spaceflight, Microgravity and Exploration Programmes, Daniel Sacotte and ASI President, Prof. Giovanni Bignami outlines the roles and responsibilities of each agency for the coordination and implementation of the mission.