



# International Space Station Columbus Module



The International Space Station's science capabilities increased in February 2008 during STS-122, also known as the 1E assembly flight, when Space Shuttle *Atlantis* and its crew delivered the Columbus Research Laboratory, which was built by the European Space Agency (ESA). Columbus is ESA's largest contribution to the on-orbit construction of the space station.

The ESA laboratory, which is named after the famous explorer Christopher Columbus, is a multifunctional, pressurized laboratory that supports scientific and technological research in the microgravity environment of low-Earth orbit, as well as performs a number of technological applications. Research areas include fluid physics, materials science, and biosciences. The Columbus module also has an external facility that hosts space science, Earth observation, and technology experiments and applications in the vacuum of space.

The cylindrical shape of the Columbus module allowed the 22.6-foot (6.9-meter) by 14.7-foot (4.5-meter) research module to be carried into space by the space shuttle. The laboratory has a volume of 2,772 cubic feet (78.49



cubic meters) with 995 cubic feet (21.18 cubic meters) of habitable space and is permanently attached to the U.S. Harmony connecting module's starboard port.

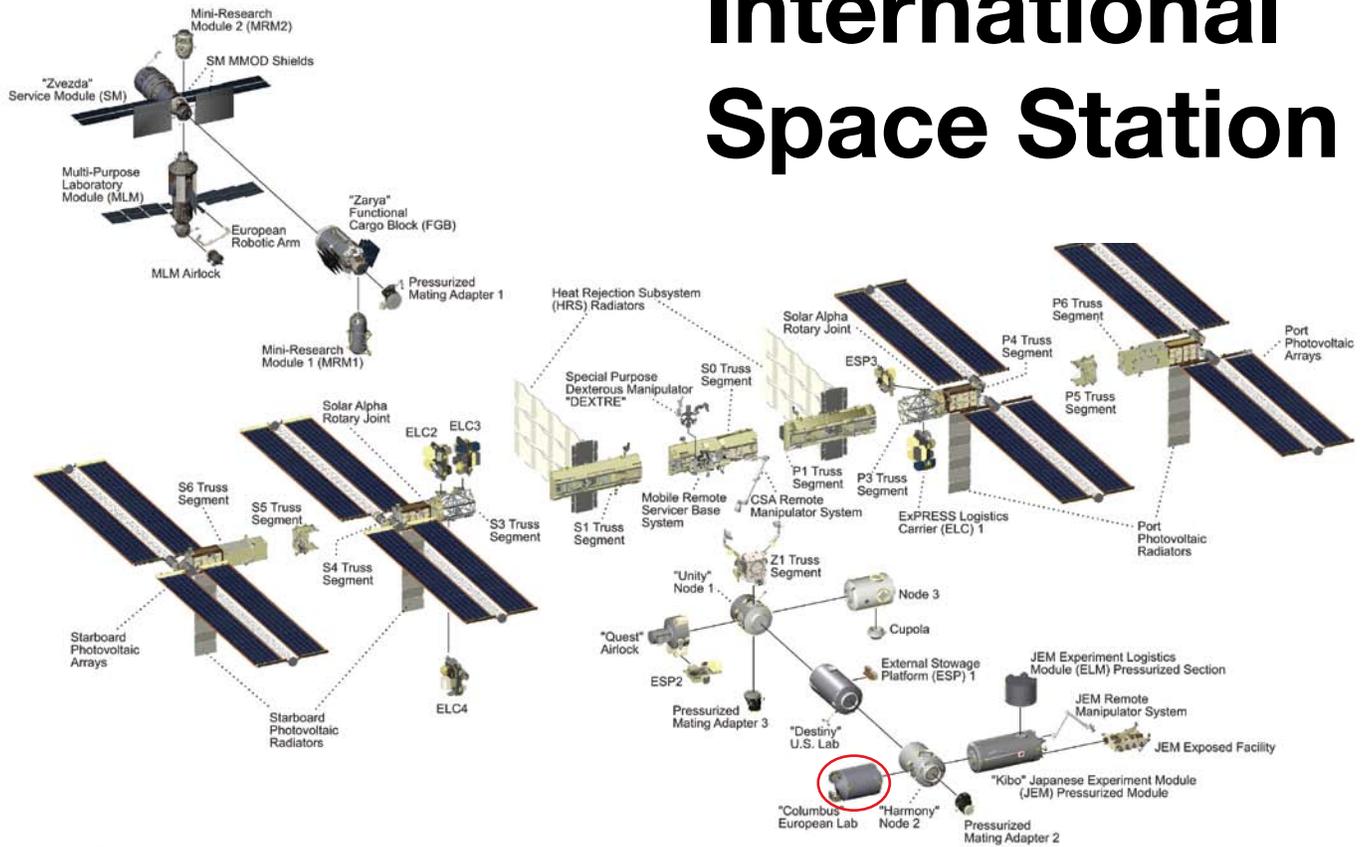
## Installation

The STS-122 crew members became construction workers the day after arriving at the station. During the first of three extravehicular activities (EVAs), astronauts used the Canadian-built station and shuttle robotic arms to install and outfit Columbus.

Astronauts used the robotic arms to lift Columbus out of *Atlantis*' payload bay and attach it to the starboard side of the Harmony module, which is also known as Node 2, and assisted in the installation by making fluid, air, power, and data cable connections between Harmony and Columbus.

The STS-122 and station's Expedition crew members entered Columbus for the first time one day after it was attached. After entering the station's new segment, they began efforts to prepare it for operation.

# International Space Station



## Science Capabilities

Columbus can house 10 refrigerator-sized payload racks devoted to scientific experiments. The module's sidewalls are the site of eight racks and the ceiling is the site for two racks.

Each rack can house an autonomous and independent laboratory that is devoted to experiments in a wide range of disciplines or many different experiments in one rack. Each rack can draw power and cooling from the standard space station payload services and has the capability to send data and imagery to researchers on the ground.



*Expedition 17 Flight Engineer Garrett Reisman conducts research inside the Microgravity Sciences Glovebox in the Columbus Module.*



## Columbus Control Center

The Columbus Control Center (COL-CC) controls and operates the ESA laboratory. The COL-CC is also responsible for coordinating Columbus' experiment operations. The COL-CC is located at the German Aerospace Center in Oberpfaffenhofen, Germany, near Munich.

For more information about the International Space Station, please visit:  
[http://www.nasa.gov/mission\\_pages/station/main/index.html](http://www.nasa.gov/mission_pages/station/main/index.html)

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