STS-106 PAYLOADS
International Space Station Assembly Flight 2A.2b

The primary objectives of the STS-106 mission will be to perform outfitting tasks in the Zvezda Service Module of the International Space Station and to transfer elements delivered on Flight 2A.2b. The crew will transfer supplies from the SPACEHAB Logistics Double Module, items mounted on the Integrated Cargo Carrier and items stowed in the middeck of Atlantis to the space station. Also, the seven astronauts will transfer supplies from a docked Russian Progress resupply ship, which arrived at the station in July.

There is one planned space walk, or Extra Vehicular Activity, to connect the Zarya Control Module to the Zvezda Service Module power and communications cables and to install hardware that will aid the space station in conserving propellant fuel.

Cargo Bay

SPACEHAB Logistics Double Module
The SPACEHAB Logistics Double Module is a pressurized, mixed-cargo carrier, which supports various quantities, sizes and locations of experiment hardware. It augments the orbiter middeck by providing a total cargo capacity of up to 4,536 kilograms (10,000 pounds) with the ability to accommodate powered payloads. The module is 6.1 meters (20 feet) long, 4.3 meters (14 feet) wide and 3.4 meters (11.2 feet) high.

For STS-106, SPACEHAB will carry approximately 3,674 kilograms (8,100 pounds) of hardware, equipment and logistical supplies to outfit the space station.

Integrated Cargo Carrier
The Integrated Cargo Carrier, or ICC, is an externally mounted, unpressurized, aluminum flatbed pallet, coupled with a keel-yoke assembly, that expands the shuttle's capability to transport cargo.

On STS-106, it will carry 1,300 kilograms (2,865 pounds) of cargo to orbit. The ICC is 2.4 meters (8 feet) long, 4.6 meters (15 feet) wide and 25 centimeters (10 inches) thick, with a capacity to carry up to 2,721 kilograms (6,000 pounds) of cargo.

The ICC also carries the SPACEHAB-Oceaneering Space System, or SHOSS, Box. SHOSS is an unpressurized "tool box" attached to the top of the ICC with the capacity to carry up to 181 kilograms (400 pounds) of tools and other flight equipment.

Space Experiment Module 8
Eye lenses, seeds, water, DNA and steel are just some of the materials that will be the subjects of student research on the eighth flight of the Space Experiment Module, or SEM, project, NASA's educational initiative to increase access to space for students from kindergarten to college. All together, 13 passive experiments will be flown on STS-106.

Since the first SEM flight in 1996, tens of thousands of students have flown experiments in space that they have created, designed, and built with the help of teachers or mentors. NASA provides the experiment modules, or containers, which are placed in standard 0.14-cubic-meter (5-cubic-foot) Getaway Special canisters that are mounted in the orbiter's payload bay.

Getaway Special G-782
The G-782 payload, or Aria-1 as it is known to its sponsors, is an educational project to give elementary and high school students in the St. Louis area an opportunity to be involved in hands-on space science and perhaps steer them toward science, engineering and technology careers. Aria-1 is a joint project of the School of Engineering and Applied Science of Washington University in St. Louis and the Cooperating School Districts, an educational consortium of 47 school districts in the greater St. Louis metropolitan area.

More than 300 students from eight St. Louis, Mo., schools prepared hypotheses, designed experiments, collected materials, and prepared flight articles under the guidance of their teachers. After the flight, the students will compare flight samples with ground controls to determine the effects of microgravity, radiation, magnetism, and other possible phenomena experienced in the low Earth orbit environment of the shuttle mission.

The payload is completely passive and requires no crew action.

In-Cabin

Commercial Generic Bioprocessing Apparatus
Commercial Generic Bioprocessing Apparatus, or CGBA, experiments that explore the ways biological processes are affected by microgravity - the near-weightlessness of space - may allow researchers better understand the nervous system. Scientists also plan to use the CGBA to investigate growing human tissue for use in surgical procedures such as skin grafts and organ transplants and in developing medicines.

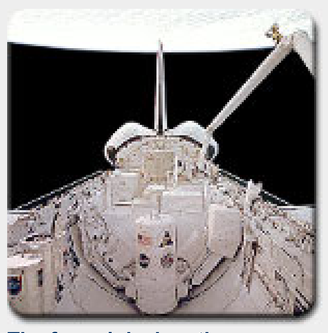
Two experiments will be conducted on STS-106: Synaptogenesis in Microgravity and Kidney Cell Gene Expression.

HTD 1403 Micro-Wireless Instrumentation System (Micro-WIS) HEDS Technology Demonstration
HTD 1403 will demonstrate the operational utility and functionality of the Micro-Wireless Instrumentation System, or micro-WIS, in orbit, initially in the crew cabin of the shuttle orbiter and then on the International Space Station. The micro-WIS consists of tiny autonomous sensors for data acquisition. Two versions have been developed — a transmitter and a recorder. This HTD is designed to demonstrate the micro-WIS transmitter and recorder.

Protein Crystal Growth Enhanced Gaseous Nitrogen Dewar
The primary purpose of the Enhanced Gaseous Nitrogen, or EGN, Dewar experiment is to demonstrate a low-cost platform for conducting a large number of experiments to determine the optimum conditions for growing large, high-quality protein crystals in space. Researchers require crystals of sufficient size and suitable quality for crystallographic analysis of their molecular structure by X-ray diffraction and computer modeling. EGN promises to give researchers greater access to space and the opportunity to conduct a statistically significant number of experiments per mission, which will increase the likelihood of obtaining crystals worthy of X-ray analysis. The STS-106 astronauts will place the Dewar aboard the International Space Station.

Students from middle and high schools across the United States are helping scientists with this project, which will become the first long-duration experiment on the space station.

What is a payload?



The formal designation as a "payload" indicates that the experiment will be accorded top priority in crew time and energies during the entire flight, along with all other experiments carrying the same "payload" designation.

Shuttle Press Kit

For more information on the full scope of the STS-106 mission, check out the Shuttle Press Kit online.

Related Links

- STS-106 Gallery Images
- Kennedy Space Center Electronic Photo File
- SPACEHAB
- Goddard Space Flight Center
- EGN Dewar Experiment Press Release