

Expedition 10

MISSION OVERVIEW



To Improve Life Here, To Extend Life to There, To Find Life Beyond.

That is NASA's vision.

**Leroy Chiao,
Expedition 10 Commander:**

"By our nature human beings are explorers. We're curious ...we need to see what's on the other side of the mountain. All kinds of benefits come out of that. The Space Station is right along those lines. We are learning how to build and operate a spacecraft for a long duration. If we are going to the Moon and Mars, we're going to have to know how. And we'll be continuing the science that will continue with the president's vision of a voyage towards Mars."

**Salizhan Sharipov,
Expedition 10 Flight Engineer:**

"New technologies, advanced technologies, are necessary to support space flights, and we learn new technologies while we are performing science in space. This is what we are contributing to humanity, to progress. We are performing both U.S. and Russian experiments. They include human research, research on the impact of space on the human body. Humans will be on the Moon, on Mars and other planets. The beginning stages of humankind in space is the study of space impact to the human body, and we are testing subjects in this respect in microgravity."

To understand and protect our home planet
To explore the Universe and search for life
To inspire the next generation of explorers
...as only NASA can.

That is NASA's mission.



Related Web Sites:

<http://www.nasa.gov/>
<http://spaceflight.nasa.gov/station/>
<http://spaceflight.nasa.gov/station/science/>
<http://spaceflight.nasa.gov/station/crew/>
<http://spaceflight.nasa.gov/station/assembly/>

Science in Orbit Looks Beyond

The Expedition 10 crew, Commander Leroy Chiao, also the NASA International Space Station science officer, and Flight Engineer Salizhan Sharipov, will maintain the Station and work with science teams on the ground to operate experiments and collect data. The Expedition 10 crew has more than 200 hours of possible payload activities. Space Station science will also be conducted by the ever-present additional "crewmembers" — the team of controllers and scientists on the ground, who will continue to plan, monitor and operate experiments from control centers across the United States.

A team of controllers for Expedition 10 will work in the Space Station's Payload Operations Center — the world's primary science command post for the Space Station — at NASA's Marshall Space Flight Center in Huntsville, Ala. Controllers work in three shifts around the clock, seven days a week in the Payload Operations Center, which links researchers around the world with their experiments and the crew aboard the Station.

Much of Expedition 10's scientific research will be carried out with equipment and supplies already aboard the Space Station. Additional experiments are being evaluated and prepared to make the best use of limited cargo space on the Soyuz or Progress vehicles.

The expedition's research agenda remains flexible. While most equipment and samples can remain onboard the Station, a few perishable samples — urine samples and crystals, for example — may be returned to Earth on the Soyuz.

The science team at the Payload Operations Center will operate some experiments without crew input. Other experiments are designed to function autonomously.

Many of the experiments will focus on future, more lengthy space flights, perhaps to Mars. Several look at human physiology in long-duration space flight. Others test concepts and equipment for medical care in the isolation of spacecraft moving beyond low-Earth orbit.

The Human Research Facility, in one of the racks of the U.S. Destiny Laboratory, includes facilities to check lung and heart function during the months-long mission. Education activities, the inspiration of the next generation of explorers, will include a number of scientific and technical activities. EarthKam provides photos from the Station to students on Earth.

The crew also will observe and photograph natural and man-made objects on Earth. Chiao and Sharipov also will conduct a number of physical sciences experiments in the Station's microgravity.

Expedition 10 Prepares for Shuttle

Expedition 10 Commander Leroy Chiao and Cosmonaut Salizhan Sharipov are scheduled to launch in mid-October aboard a Soyuz spacecraft for a two-day flight to the International Space Station and a scheduled six-month stay aboard the orbiting laboratory.

With them will be Yuri Shargin, 40, a Russian Space Forces test cosmonaut making his first space flight. He will return to Earth in Kazakhstan with the Expedition 9 crew after an eight-day stay on the Station. Expedition 9 Commander Gennady Padalka and NASA ISS Science Officer Mike Fincke

have been on the Station since April 21.

Chiao and Sharipov are expected to spend about 190 days aboard the ISS. After the Space Shuttle Columbia accident on Feb. 1, 2003, the ISS Program and the international Partners determined that the Station would be occupied by only two crewmembers until the resumption of Shuttle flights because of limitations on consumables.

Chiao, 44, holds a master's and a doctorate in chemical engineering from the University of California at Santa Barbara. He worked in advanced aerospace research before joining NASA as an astronaut in 1990. He



Expedition 10 takes flight with Commander and NASA ISS Science Officer Leroy Chiao (left) and Flight Engineer and Cosmonaut Salizhan Sharipov. Astronaut Chiao makes his second trip to the International Space Station (ISS). His first visit was in October 2000 aboard Space Shuttle Discovery. Sharipov makes his second above Earth's atmosphere. He commands the Soyuz spacecraft that will deliver Expedition 10 to the ISS and return them back to Earth.

Expedition 9 Commander Gennady Padalka (below left) completes his second mission. His first was aboard the Mir Space Station. NASA ISS Science Officer Michael Fincke (below right) completes his first mission ever.



Shuttle ...

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is a veteran of three Shuttle flights.

Sharipov, 40, is a colonel in the Russian Air Force and a former fighter pilot and pilot instructor. He was selected as a cosmonaut in 1990. He has flown one space mission aboard Shuttle Endeavour on STS-89 — a mission to Mir.

Two spacewalks in Russian spacesuits from the Pirs Docking Compartment are scheduled for Chiao and Sharipov. The spacewalks, planned for January and March, will continue the external outfitting of the Zvezda Service Module. They also would install additional communications gear outside Zvezda for next fall's arrival of the European Space Agency's unpiloted Automated Transfer Vehicle, a cargo ship similar to the Russian Progress Vehicle.

Chiao and Sharipov will also prepare for the first post-Columbia Shuttle mission, STS-114. Discovery will deliver supplies to the Station. The mission will include three spacewalks. One will replace a Control Moment Gyroscope that failed in June 2002. During another, spacewalkers will install a stowage platform to house spare parts and other hardware for Station assembly tasks. A third spacewalk will demonstrate thermal

protection system repair techniques. STS-114 crewmembers Soichi Noguchi and Steve Robison will conduct all three spacewalks from the U.S. Quest Airlock wearing U.S. spacesuits.



Test Cosmonaut Yuri Shargin (center) will launch with Expedition 10 to the Space Station. He will return to Earth several days later with Expedition 9.

Chiao and Sharipov will also spend time packing accumulated Station hardware for return to Earth on STS-114 and the subsequent Shuttle flight, STS-121.

Station operations and Station maintenance will take up a considerable share of the time for Chiao and Sharipov. Science will continue, as will science-focused education activities and Earth observations.

Chiao and Sharipov will monitor the arrival of two Russian Progress resupply cargo ships filled with food, fuel, water and supplies. They will also don their spacesuits and relocate their Soyuz spacecraft from the Pirs docking port to the Zarya docking port to open the Pirs airlock for their spacewalks.

ISS Progress 16 cargo ship is scheduled to reach the ISS in late November and ISS Progress 17 is to arrive at the end of January.



Expedition 1

Launch.....Oct. 2000
MissionISS Flight 2R
Return.....March 2001
Duration136 Days



Expedition 2

LaunchMarch 2001
MissionSTS-102
ReturnAug. 2001
Duration149 Days



Expedition 3

LaunchAug. 2001
MissionSTS-105
ReturnDec. 2001
Duration117 Days



Expedition 4

Launch.....Dec. 2001
Mission.....STS-108
ReturnJune 2002
Duration181 Days



Expedition 5

LaunchJune 2002
Mission.....STS-111
ReturnNov. 2002
Duration171 Days



Expedition 6

Launch.....Nov. 2002
Mission.....STS-113
ReturnMay 2003
Duration160 Days



Expedition 7

LaunchApril 2003
Mission.....ISS Soyuz 6
ReturnOct. 2003
Duration182 Days



Expedition 8

LaunchOct. 2003
Mission.....ISS Soyuz 7
ReturnApril 2004
Duration195 Days



Expedition 9

LaunchApril 2004
Mission.....ISS Soyuz 8
ReturnOct. 2004
DurationTBD