NASA Mission Summary

National Aeronautics and Space Administration
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STS-128 MISSION SUMMARY **August 2009**

SPACE SHUTTLE DISCOVERY (STS-128)

Discovery's flight will deliver supplies and equipment to the International Space Station. Inside the shuttle's cargo bay is the *Leonardo* Multi-Purpose Logistics Module (MPLM), a pressurized "moving van" that will be temporarily installed to the station. The module will deliver science and storage racks, a freezer to store research samples, a new sleeping compartment and the COLBERT treadmill. The 13-day mission will include three spacewalks to replace experiments outside the European Space Agency's Columbus laboratory, and install a new ammonia storage tank and return the used one. Ammonia is used to move excess heat from inside the station to the radiators located outside. Discovery also will deliver a new crew member and bring back another after almost two months aboard the space station.

CREW

Rick Sturckow (STUR-coe)
Commander (Colonel, U.S. Marine Corps)
- Veteran of three spaceflights
- Age: 48 (Aug. 11), Hometown: Lakeside, Calif.
- Married with two children
- Enjoys flying and physical training
- Nickname: C.J.

Kevin Ford
Pilot (Colonel, U.S. Air Force, Ret.)
- First spaceflight
- Age: 49, Hometown: Montpelier, Ind.
- Married with two children
- Ph.D. in astronautical engineering, 1997
- Served as a CAPCOM from 2005-2008

Patrick Forrester
Mission Specialist-1 (Colonel, U.S. Army, Ret.)
- Veteran of two spaceflights
- Age: 52, Hometown: Springfield, Va.
- Married with two children
- Logged 4,400+ hours in 50+ different aircraft
- Enjoys baseball and running

José Hernández
Mission Specialist-2
- First spaceflight
- Age: 47, Hometown: Stockton, Calif.
- Married with five children
- NASA's first bilingual Twitter, @Astro_Jose
- From Mexican migrant farming family

John "Danny" Olivas (oh-LEE-vuhs)
Mission Specialist-3 (Ph.D)
- Veteran of one spaceflight
- Age: 43, Hometown: El Paso
- Married with five children
- Ph.D. in mechanical engineering & materials science, 1996

Christer Fuglesang (FYU-gel-sang)
Mission Specialist-4 (European Space Agency)
- Veteran of one spaceflight
- Age: 52, Born: Stockholm, Sweden
- Married with three children
- Ph.D. in particle physics, 1991
- Enjoys sailing, frisbee and reading

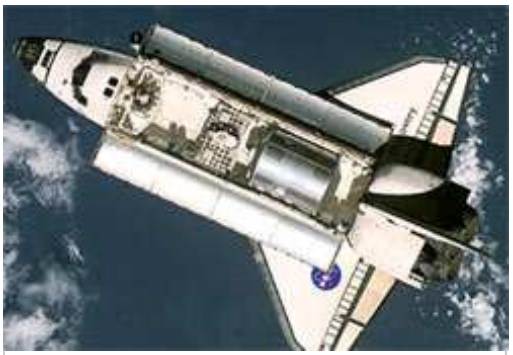
Nicole Stott
Mission Specialist-5/Expedition 20 Flight Engineer
- First spaceflight
- Age: 46, Hometown: Clearwater, Fla.
- Married with one child
- Returns on STS-129, targeted November 2009
- Last station astronaut to be rotated on shuttle

Tim Kopra (CO-prah)
Mission Specialist-5/Expedition 20 Flight Engineer
- Colonel, U.S. Army
- Launched to the station on STS-127, July 15
- Age: 45, Hometown: Austin, Texas
- Married with two children
- Returns to Earth on STS-128

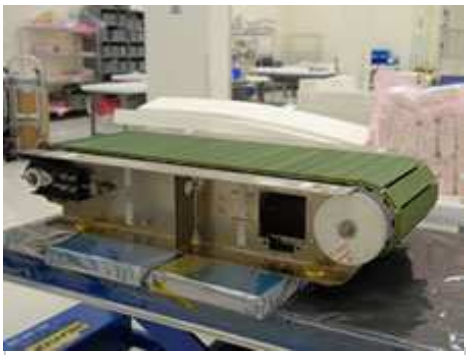
The patch represents the hardware, people and partner nations that contribute to the flight. Discovery is shown in the orbit configuration with the MPLM Leonardo in the payload bay. Earth and the space station wrap around the Astronaut Office symbol reminding us of the continuous human presence in space. The names of the crew border in an unfurled manner. The banner also contains the U.S. and Swedish flags representing the countries of the STS-128 crew.

SPACEWALKS Each will last approximately 6.5 hours.

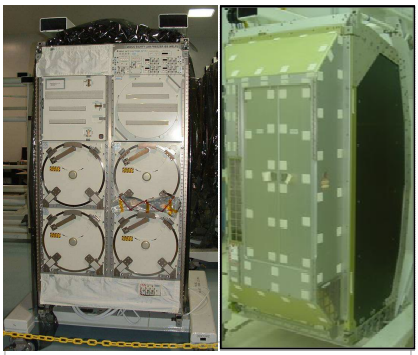
- On flight day 5: Olivas and Stott will prepare for the replacement of an empty ammonia tank on the station's port truss, or backbone, by releasing its bolts. They also will retrieve a materials processing experiment and a European science experiment mounted outside the Columbus laboratory and stow them in Discovery's cargo bay for their return to Earth.
- On flight day 7: Olivas and Fuglesang will remove the new ammonia tank from the shuttle's payload bay and replace it with the used tank on the station. The new tank, weighing about 1,800 pounds, is the most mass ever moved around by spacewalking astronauts. After the new tank is installed, the old one will be stowed in the shuttle for its return to Earth.
- On flight day 9: Olivas and Fuglesang will deploy an attachment system that will be used to hang spare parts on the station's truss. They also will replace a device designed to help the station determine its position relative to the Earth and install a new circuit breaker. The spacewalkers will prepare for the arrival of the Tranquility node by attaching cables between the starboard truss and the Unity node, the area where Tranquility will be installed. Tranquility is targeted to arrive to the station on STS-130 in February 2010.



Shuttle carrying 4.5-ton MPLM



COLBERT treadmill



MELFI & Sleeping Quarters

FACTS & FIGURES

- STS-128 is the 128th space shuttle flight, the 30th to the station, the 37th for Discovery and the fourth in 2009. Six flights to the station remain after STS-128 before the shuttles retire in 2010.
- The MPLM will carry 15,200 pounds of cargo. Using the station's robotic arm, it will be installed to the station on flight day 4 and returned to the shuttle's cargo bay on flight day 11 for its return to Earth.
- Inside the MPLM will be two new experiment racks – the materials science research rack-1 and the fluids integrated rack.
    - The materials rack will allow the crews of the space station to conduct experiments on such diverse materials as metals, glasses, crystals and ceramics. They'll be able to study how materials mix and solidify or how crystals grow, outside the confines of the Earth's gravity.
    - Colloids, gels, bubbles, boiling, and cooling are a few of the areas to be studied using the fluids rack.
- Discovery also will bring up a second Minus Eighty Laboratory Freezer for ISS – or MELFI.
    - MELFI will support a wide range of life science experiments by preserving biological samples (blood, saliva, urine, microbial or plant) collected on station for later return and analysis on Earth.
- The shuttle will carry a new crew quarters for the Tranquility node and the Atmospheric Revitalization System, an additional air purification system for the node.
    - A new carbon dioxide scrubbing device will be integrated into the ARS. It will compliment the Carbon Dioxide Removal Assembly already on the station. Teams had to trouble shoot the CDRA on orbit in July after a failed heater prevented the system from operating automatically.
- STS-128 will fly the Combined Operational Load-Bearing External Resistance Treadmill, or COLBERT.
    - NASA selected the treadmill's name after comedian and host Stephen Colbert of Comedy Central's "The Colbert Report" took interest during the Node 3 naming poll and urged his followers to post the name "Colbert," which received the most entries. The treadmill will be the second on the station.
    - The astronauts on the station are expected to spend about 20 hours putting the COLBERT together. COLBERT will reside first inside the Harmony module. Later, it will move into Tranquility.
- The STS-128 mission (as did STS-125 and STS-127) will take part in crew seat vibration tests that will help engineers on the ground understand how astronauts experience launch. They'll then use the information to help design the crew seats that will be used in future NASA spacecraft.