

SpaceX-3

Manifest Summary

National Aeronautics and
Space Administration



OVERVIEW

SpaceX-3 will deliver approximately 5,000 pounds of science and research, crew supplies, vehicle hardware and spacewalk tools to the International Space Station and support more than 150 scientific investigations that will occur during Expeditions 39 and 40. The scientific payloads on Dragon include investigations focusing on efficient ways to grow plants in space, demonstrating laser optics to communicate with Earth, human immune system function in microgravity and Earth observation. Aboard the cargo ship are a set of high-tech legs for Robonaut 2, which can provide the humanoid robot torso already aboard the orbiting laboratory with the mobility it needs to help with regular and repetitive tasks inside the space station. Dragon will also deliver the second set of investigations sponsored by the Center for the Advancement of Science in Space (CASIS), which manages the portion of the space station designated a U.S. National Laboratory. CASIS investigations on Dragon are part of the organization's initial suite of supported payloads linked to Advancing Research Knowledge 1 (ARK 1). The investigations include research on protein crystal growth, which may lead to drug development through protein mapping, and plant biology. When the spacecraft splashes down in the Pacific Ocean west of Baja California, it will bring with it nearly 3,500 pounds of science, hardware, crew supplies and spacewalk tools from the space station.

LAUNCH

- Food, provisions and care packages for the crew
- Two European Space Agency science investigations
- Seven JAXA investigations
- 15 NASA investigations including:
 - * T-Cell Act in Aging
 - * OPALS
 - * VEGGIE facility and Veg-01
 - * HDEV
 - * CASIS ARK-1
 - * Robonaut legs and mobility kits
- Communications and Tracking equipment
- Spacewalking equipment including:
 - * Short EMU
 - * Snorkel assemblies and filters
 - * Fan pump separator
- Vehicle hardware including:
 - * Crew Health Care System CMS elements
 - * Environmental Control and Life Support System hardware
 - * Electrical power System cables
- Computer resources

RETURN

- Crew supplies
 - Data and/or samples from:
 - * Two European Space Agency experiments
 - * One Canadian Space Agency experiment
 - * 10 JAXA experiments
 - * 15 NASA investigations including:
 - AES-1
 - BASS
 - BCAT-6
 - T-Cell Act in Aging
 - Ants in Space
 - Micro- -7
 - Spacewalking equipment including:
 - * Filters, kits, post-flight analysis packets
 - * LCVGs, SAFERs
 - * Fan pump separators
 - Vehicle hardware including:
 - * Crew Health Care System environmental health system and maintenance systems elements
 - * Communications and Tracking equipment
 - * ECLSS hardware
 - * Internal Thermal Control System hardware

SECONDARY PAYLOADS

SpaceX's Falcon rocket will jettison five small satellites known as CubeSats during ascent to provide an array of technology demonstrations. The small satellites are part of NASA's Educational Launch of Nanosatellite, or ELaNa, mission and involved more than 120 students in their design, development and construction.



Dragon will be grappled by Expedition 39 Commander Koichi Wakata of the Japan Aerospace Exploration Agency. He will use the space station's robotic arm to take hold of the spacecraft. NASA Flight Engineer Rick Mastracchio will support Wakata in a backup position. Ground commands will be sent from Houston for the station's arm to rotate Dragon around and install it on the bottom side of the station's Harmony module, enabling it to be bolted in place for its stay at the International Space Station.