



OVERVIEW

CRS-11 Mission

Northrop Grumman's 11th contracted cargo resupply mission (CRS-11) with NASA to the International Space Station will deliver about 7,600 pounds of science and research, crew supplies and vehicle hardware to the orbital laboratory and its crew. Launch is targeted for no earlier than Wednesday, April 17, 2019.



Launch Vehicle Antares 230 Rocket

- Features RD-181 engines
- Increased performance and flexibility

Launch Site:
Wallops Flight Facility, Virginia



S.S. Roger Chaffee



The Cygnus spacecraft for this space station resupply mission is named in honor of Roger Chaffee who died in the Apollo 1 fire on Jan. 27, 1967 along with Gus Grissom and Ed White.

Cygnus Spacecraft

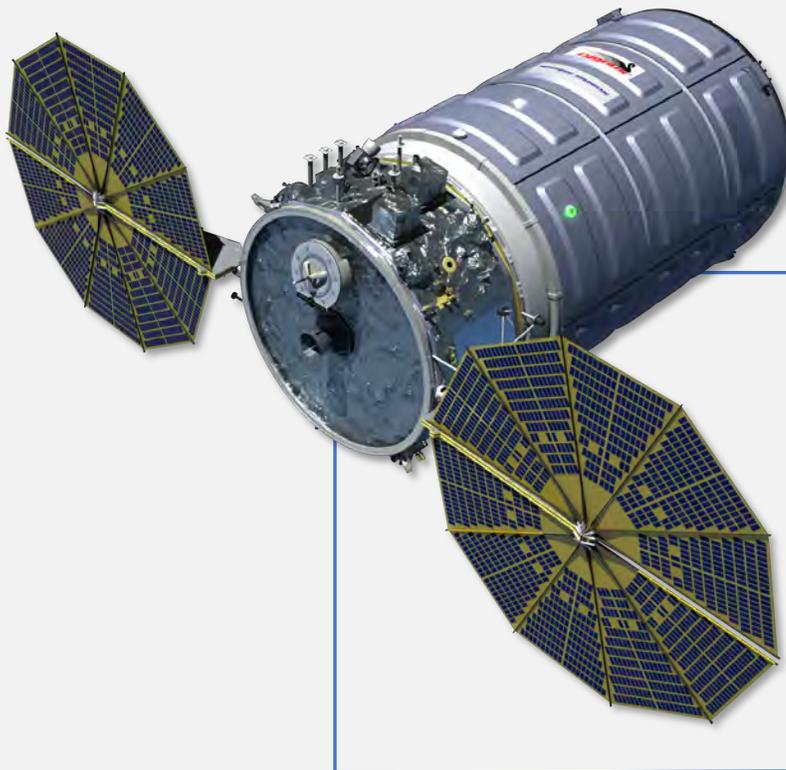


- Will deliver hardware and supplies to support dozens of science and research investigations
- Will conclude its NASA mission after three months attached to the space station's Unity module
- This mission demonstrates a late load capability and a solo long-duration mission for Cygnus after departing station

CARGO

CRS-11 Mission

*Masses are subject to change prior to launch



Crew Supplies

2,065 lbs. / 936 kg

Science Investigations

3,459 lbs. / 1,569 kg

Spacewalk Equipment

53 lbs. / 24 kg

Vehicle Hardware

1,384 lbs. / 628 kg

Computer Resources

10 lbs. / 5 kg

NG Hardware

77 lbs. / 35 kg

Total Cargo:

7,575 lbs. / 3,436 kg

Total Pressurized Cargo with Packaging:

6,971 lbs. / 3,162 kg

Unpressurized Cargo (NanoRacks Deployer):

527 lbs. / 239 kg



HARDWARE

CRS-11 Mission

Highlights



Thermal Amine Scrubber: Hardware that will test a new method to remove carbon dioxide onboard the ISS. This hardware will serve as a proof of concept for CO₂ removal capability on future deep space explorations.



Space-to-Ground Transmitter-Receiver-Controller (SGTRC): Spare hardware for the communications system that provides the capability to downlink onboard video and science data.



N₂ and O₂ Recharge Tanks: Two tanks to replenish N₂ and O₂ onboard as it is consumed for payloads, EVAs, and nominal ISS operations.



Animal Enclosure Module (AEM-X): Launching rodents to support science investigations in orbit. This is the first flight for rodent research on a Cygnus.



Cryo Chiller: Hardware to augment rapid freeze capability in orbit for payload investigations.

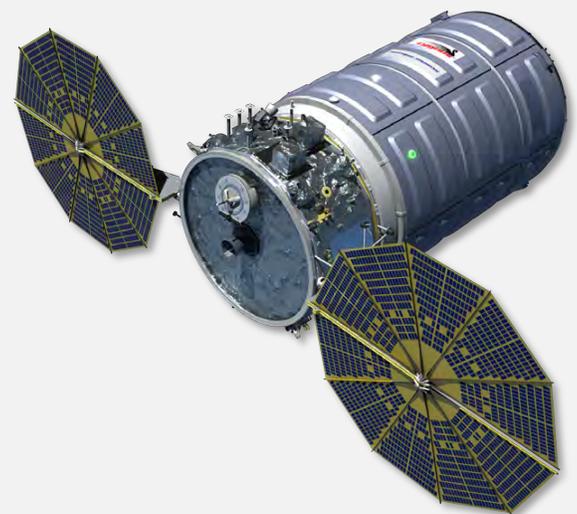
Robotic Arm Operators for Cygnus Capture



Anne McClain (prime)
NASA



David Saint-Jacques
CSA



RESEARCH

CRS-11 Mission

The new experiments arriving to the orbital laboratory will challenge and inspire future scientists and explorers. Science payloads will look into different areas like robotics, in-space manufacturing, and astronaut health.



[Astrobee](#) is NASA's next generation of free-flying robots aboard the space station. The self-contained, cube-shaped robots are designed to help scientists and engineers develop and test technologies for use in microgravity to assist astronauts with routine chores, and give ground controllers additional eyes and ears on the space station. The autonomous robots, powered by fans and vision-based navigation, perform crew monitoring, sampling, logistics management, and accommodate up to three investigations. They are operated remotely from the ground.



Manufacturing Fiber Optic Cable in Microgravity ([Space Fibers](#)) evaluates a method for producing fiber optic cable from a blend of zirconium, barium, lanthanum, sodium and aluminum, called ZBLAN, in space. ZBLAN produces glass one hundred times more transparent than silica-based glass, exceptional for fiber optics. Microgravity suppresses two mechanisms that commonly degrade fiber, and previous studies showed improved properties in fiber drawn in microgravity compared to that fabricated on the ground. ZBLAN fiber is a unique candidate for improved imaging, remote sensing and next generation optical communications on Earth due to its low loss and higher bandwidth.



The [Bio-Analyzer](#) is a Canadian Space Agency onboard instrument that serves as a platform for scientific experiments where astronauts can easily test different body fluids such as blood, saliva and urine and get returned key biomedical analyses within a few hours. Scientists will be able to use the Bio-Analyzer's data to accelerate science experiments. In the future, this type of device could help keep a closer eye on astronauts' health.



Astronauts show accelerated arterial stiffening, thicker artery walls and signs associated with the development of insulin resistance after spending six months in space. This dramatic change in carotid artery "aging" was unrecognized until recently, so the [Vascular Aging investigation](#) will include critical onboard investigations to test the relationship among a crew member's metabolism, aging arteries and aging bones. The results of this study could have great importance for assessing a newly identified risk for astronaut cardiovascular health potentially pointing to mechanisms to reduce risk.