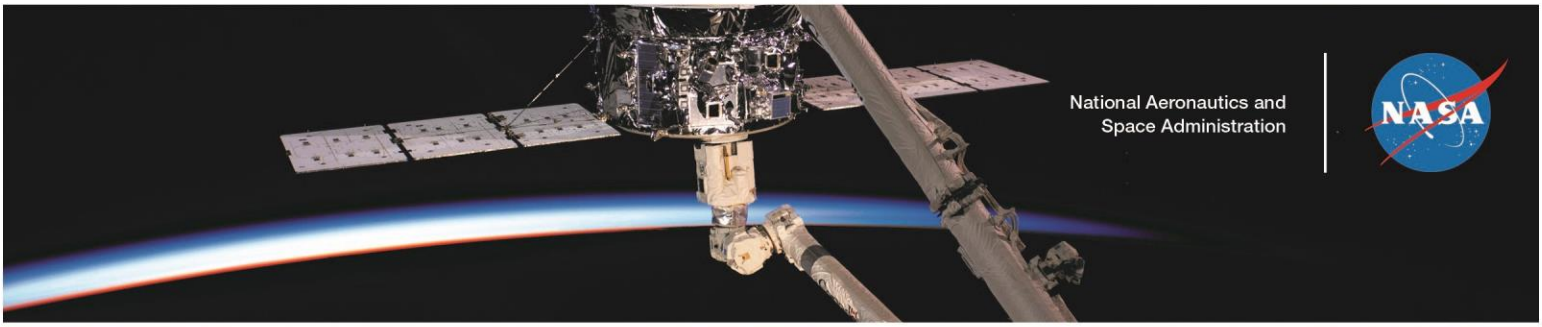


ORBITAL ATK CRS-4 MISSION OVERVIEW

Orbital ATK's fourth contracted cargo resupply mission with NASA to the International Space Station will deliver more than 7,000 pounds of science and research, crew supplies and vehicle hardware to the orbital laboratory and its crew. Launch is targeted for Thursday, Dec. 3, 2015.

The spacecraft will launch aboard an Atlas V rocket from Cape Canaveral Air Force Station in Florida, carrying essential supplies to the crew aboard the station. After arriving at the station, station crew members Scott Kelly and Kjell Lindgren will use the station's robotic arm to capture Cygnus. It will be the first cargo ship to be berthed to the Earth-facing port on the Unity module.

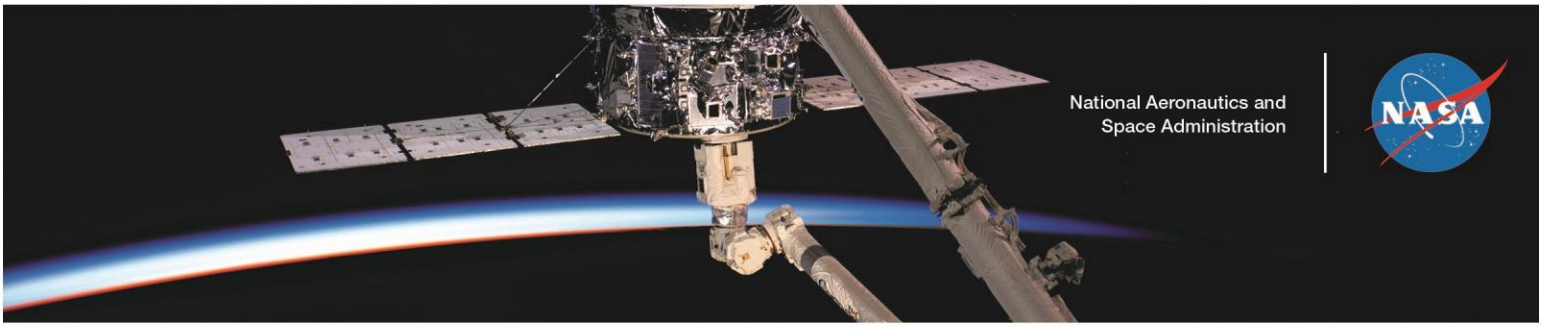
Cygnus will carry hardware and supplies to support dozens of the of approximately 250 science and research investigations that will occur during Expeditions 45 and 46.

The Cygnus spacecraft will spend more than a month attached to the space station. In January, the spacecraft will dispose of approximately 3,000 pounds of trash during its destructive reentry into Earth's atmosphere.

TOTAL CARGO:	**7383.3 lbs. / 3349 kg**
• *Science Investigations*	*1867.3 lbs. / 847 kg*
• *Crew Supplies*	*2603.7 lbs. / 1181 kg*
• *Vehicle Hardware*	*2220.1 lbs. / 1007 kg*
• *Spacewalk Equipment*	*500.4 lbs. / 227 kg*
• *Computer Resources*	*191.8 lbs. / 87 kg*
TOTAL CARGO WITH PACKAGING:	**7745.5 lbs. / 3513.3 kg**

This will be the first flight of an enhanced Cygnus spacecraft to the International Space Station. The cargo freighter now features a greater payload capacity, new UltraFlex solar arrays and new fuel tanks. This is also the first Cygnus mission utilizing the Atlas V launch system, providing increased performance and flexibility to the Orbital ATK cargo delivery service.

Cygnus' pressurized cargo module (PCM) has been extended and increases the spacecraft's interior volume capacity by 25 percent, enabling more cargo to be delivered with each mission. With the increase in volume, coupled with weight savings from upgraded components, the enhanced Cygnus has a maximum payload of more than 3,500 kilograms (7,700 pounds), which is 1,200 kilograms (2,630 pounds) more than its predecessor.



ORBITAL ATK CRS-4 RESEARCH OVERVIEW

The new experiments arriving to the orbital laboratory will challenge and inspire future scientists and explorers. Science payloads will offer a new life science facility that will support studies on cell cultures, bacteria and other microorganisms; a microsatellite deployer and the first microsatellite that will be deployed from the space station; experiments that will study the behavior of gases and liquids and clarify the thermo-physical properties of molten steel and evaluations of flame-resistant textiles.

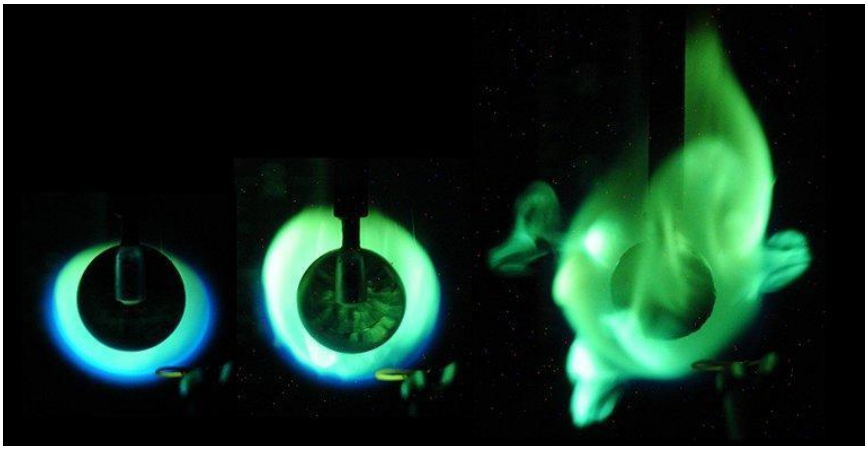
In addition, the Cygnus will deliver replacement cargo items including a set of Microsoft HoloLens devices for use in NASA's Sidekick project, a new jet pack astronauts wear during spacewalks known as SAFER, and high pressure nitrogen and oxygen tanks to plug into the station's air supply network.

NanoRacks-MicroSat-SIMPL is a modular, Hyper Integrated Satellite (HiSat) designed to provide complete satellite functionality in a nanosatellite scale. It will be the first NanoRacks microsatellite deployed from ISS and the first propulsion-capable satellite deployed from **NanoRacks-MicroSat-Deployer (Kaber)**. This is a commercial deployer system aimed at addressing the growing market of customers wanting to deploy microsatellites in orbit.

The Packed Bed Reactor Experiment (PBRE) studies the behavior of gases and liquids when they flow simultaneously through a column filled with fixed porous media, which is of interest in many chemical and biological processing systems as well as many geophysical applications.

Network & Operation Demonstration Satellites (NODES) are a part of NASA's Small Spacecraft Technology Program. Two Nodes satellites will be deployed from the International Space Station to demonstrate new network capabilities critical to the operation of swarms of spacecraft. They will demonstrate the ability of multi-spacecraft swarms to receive and distribute ground commands, exchange information periodically, and autonomously configure the network by determining which spacecraft should communicate with the ground each day of the mission.

The Space Automated Bioproduct Lab (SABL) is a new space life science facility that is designed to support a wide variety of fundamental, applied and commercial space life sciences research, as well as education-based investigations for students from kindergarten through university. Research will be supported on microorganisms (bacteria, yeast, algae, fungi, viruses, etc.), animal cells and tissues and small plant and animal organisms.



BASS-M (Burning and Suppression of Solids – Milliken) will evaluate flame retardant and/or resistant textiles as a mode of personal protection from fire-related hazards. Studying flame retardant and/or resistant behavior of different materials in microgravity will aid in better designs for future textiles and benefit those who wear flame retardant and/or resistant protective apparel such as military personnel and civilian workers in the electrical and energy industries.

BASS-M is the latest in a line of combustion experiments studying the unique behavior of fire in microgravity. Credit: NASA