ORBITAL ATK CRS-5 MISSION OVERVIEW

Orbital ATK's sixth contracted cargo resupply mission with NASA to the International Space Station will deliver over 5,100 pounds of science and research, crew supplies and vehicle hardware to the orbital laboratory and its crew. Launch is targeted for Thursday, October 13, 2016.

The spacecraft will launch aboard an Antares rocket from Wallops Flight Facility in Virginia, carrying essential supplies to the crew aboard the station. After arriving at the station, crew members Kate Rubins and Takuya Onishi will use the station's robotic arm to capture Cygnus. It will be berthed to the Earth-facing port on the Unity module.

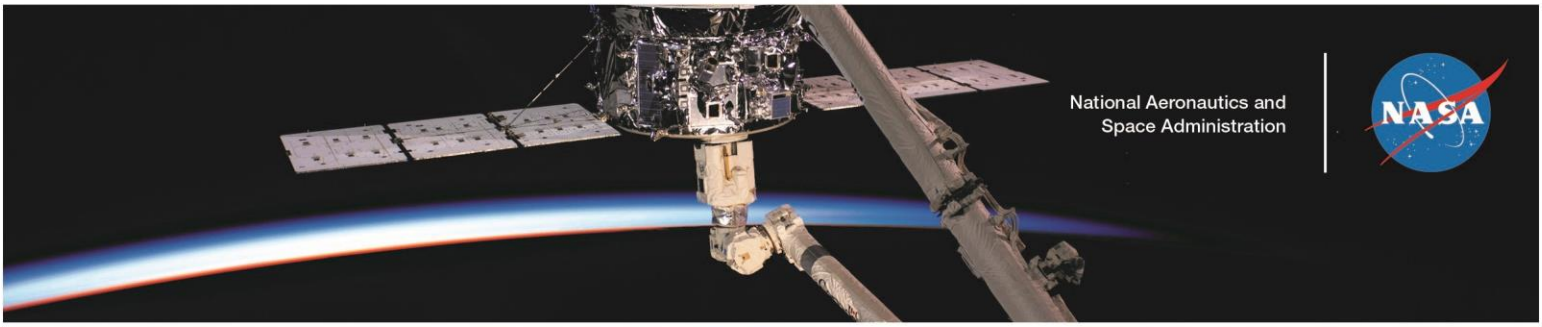
Cygnus will carry hardware and supplies to support dozens of the of approximately 250 science and research investigations that will occur during Expeditions 49 and 50.

The Cygnus spacecraft will spend over one month attached to the space station. In November, the spacecraft will dispose of about 3,000 pounds of trash during its destructive reentry into Earth's atmosphere.

TOTAL CARGO:	**4870 lbs. / 2209 kg**
• *Science Investigations*	*1097.9 lbs. / 498 kg*
• *Crew Supplies*	*1289.7 lbs. / 585 kg*
• *Vehicle Hardware*	*2255.3 lbs. / 1023 kg*
• *Spacewalk Equipment*	*11 lbs. / 5 kg*
• *Computer Resources*	*123.5 lbs. / 56 kg*
• *Russian Hardware*	*92.6 lbs. / 42 kg*
TOTAL CARGO WITH PACKAGING:	**5163.2 lbs. / 2342 kg**
UNPRESSURIZED CARGO (Cubesats)	**183 lbs. / 83 kg**

Cygnus will be launched into orbit using Orbital ATK's upgraded Antares 230 launch vehicle from Virginia Space's Mid-Atlantic Regional Spaceport Pad 0A on Wallops Island, Virginia at NASA's Wallops Flight Facility. The Antares 230 vehicle features all new RD-181 engines which provide increased performance and flexibility to the Orbital ATK cargo delivery service. This will be also be the third flight of an enhanced Cygnus spacecraft, featuring a greater payload capacity, new UltraFlex solar arrays and new fuel tanks.

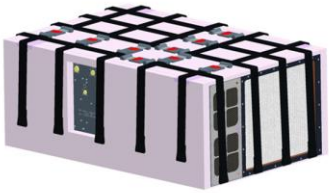
The Cygnus spacecraft for the OA-5 space station cargo resupply mission is named in honor of former astronaut and Naval Aviator Captain Alan Poindexter. Selected for NASA's astronaut program in 1998, he flew on two space shuttle missions during his career as an astronaut. Learn more about Alan Poindexter **here.**



ORBITAL ATK CRS-5 RESEARCH OVERVIEW

The **new experiments arriving to the orbital laboratory** will challenge and inspire future scientists and explorers. Science payloads will study fires in space, the effect of lighting on sleep and daily rhythms, collection of health-related data, and a new way to measure neutrons.

Saffire-II, the second Saffire experiment conducted on a Cygnus spacecraft, provides a new way to study a realistic fire on an exploration vehicle. The investigation quantifies the flammability of several materials in microgravity, and compares them to flammability limits in normal Earth gravity. Nine experimental samples of varying materials burn inside an empty Cygnus resupply vehicle after it leaves the International Space Station and before it re-enters Earth's atmosphere.



Saffire experiment module with foam packing and straps as it will be mounted in Cygnus. Hardware consists of a flow duct containing the sample card and an avionics bay. All power, computer, and data acquisition modules are contained in the bay. Dimensions are approximately 53- by 90- by 133-cm. Credits: NASA

Cool Flames investigates the phenomenon of when some types of fuels that initially burn very hot, then appear to go out — but then continue burning at a much lower temperature, with no visible flames (cool flames). Understanding cool flame combustion helps scientists develop new engines and fuels that are more efficient and less harmful to the environment. The Cool Flames Investigation provides new insight into this phenomenon, as well as new data on fire safety in space.

Image of a burning droplet in microgravity during a Flammability and Extinction (FLEX) test. The new Cool Flames experiment will study a unique phenomenon of fuel burning at low temperatures with no visible flames. Credits: NASA

The **Lighting Effects** investigation tests a new lighting system aboard the station designed to enhance crew health and keep their body clocks in proper sync with a more regular working and resting schedule. The system uses adjustable light-emitting diodes (LEDs) and a Dynamic Lighting Schedule (DLS) that varies intensity and spectrum of the LEDs in tune with sleep and wake schedules. Research has shown that enhancing certain types of light can improve alertness and performance while other types can promote better sleep.

A user-friendly tablet app provides astronauts with a new and faster way to collect a wide variety of personal data. The **EveryWear** investigation tests use of this French-designed technology to record and transmit data on nutrition, sleep, exercise and medications. EveryWear has potential for use in science experiments, biomedical support and technology demonstrations.

Expedition 18 Commander, Mike Fincke, with an early version of a Solid State Lighting Assembly (the General Luminaire Assembly or GLA) in Node 2 of the ISS Credits: NASA

Outside the Earth's magnetic field, astronauts are exposed to space radiation that can reduce immune response, increase cancer risk, and interfere with electronics. The **Fast Neutron Spectrometer** (FNS) investigation will help scientists understand high-energy neutrons, part of the radiation exposure experienced by crews during spaceflight, by studying a new technique to measure electrically neutral neutron particles.