ORBITAL ATK CRS-7 MISSION OVERVIEW

Orbital ATK's seventh contracted cargo resupply mission (CRS-7) with NASA to the International Space Station will deliver more than 7,600 pounds of science and research, crew supplies and vehicle hardware to the orbital laboratory and its crew. Launch is targeted for Tuesday, April 18, 2017.

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, crew members Peggy Whitson and Thomas Pesquet 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 51 and 52.

The Cygnus spacecraft will spend about three months attached to the space station. In July, the spacecraft will dispose of several thousand pounds of trash during its destructive reentry into Earth's atmosphere.

TOTAL CARGO:	**7,625.8 lbs. / 3,459 kg**
TOTAL PRESSURIZED CARGO WITH PACKAGING:	**7,442.8 lbs. / 3,376 kg**
• *Science Investigations*	*2,072.3 lbs. / 940 kg*
• *Crew Supplies*	*2,103.2 lbs. / 954 kg*
• *Vehicle Hardware*	*2,678.6 lbs. / 1,215 kg*
• *Spacewalk Equipment*	*160.9 lbs. / 73 kg*
• *Computer Resources*	*4.4 lbs. / 2 kg*
• *Russian Hardware*	*39.7 lbs. / 18 kg*
UNPRESSURIZED CARGO (CubeSats)	**183 lbs. / 83 kg**

Cygnus will be launched into orbit using the Atlas V launch system, providing increased performance and flexibility to the Orbital ATK cargo delivery service. This will be also be the fourth 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-7 space station cargo resupply mission is named in honor of John Glenn, the first American to orbit the Earth. Glenn, who passed away in December at age 95, was one of NASA's original seven astronauts. After making his landmark orbital mission in February 1962, he served as a U.S. senator from Ohio. After retiring from politics, Glenn made his second spaceflight in 1998 as part of the STS-95 crew flying space shuttle Discovery. Learn more about the vehicle naming and John Glenn **here.**

ORBITAL ATK CRS-7 RESEARCH OVERVIEW

The **new experiments arriving to the orbital laboratory** will challenge and inspire future scientists and explorers. Science payloads will advance capabilities to grow fresh food in space, provide new data on spacecraft conditions during re-entry, improve the reproducibility of experiments in space and investigate how to increase the effectiveness of chemotherapy drugs and reduce side effects.

The **Advanced Plant Habitat** will be used to conduct plant bioscience research on the space station, and help NASA prepare crew to grow their own food in space during deep-space exploration missions. The large, enclosed chamber measures 18 inches square, with two inches for the root system and 16 inches available for growth height. It is designed to support commercial and fundamental plant research or other bioscience research aboard the space station for up to a 135-day science investigation, and for at least one year of continuous operation without maintenance.

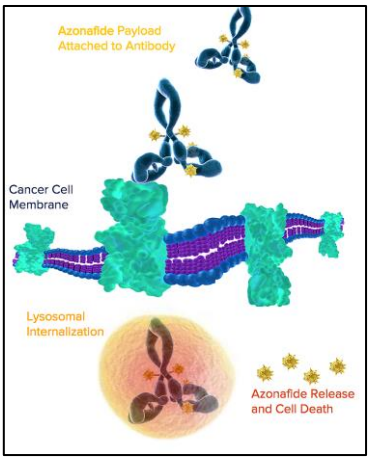
The **RED-Data2** investigation studies a new type of recording device that rides along a vehicle reentering Earth's atmosphere, providing crucial data about the extreme conditions a spacecraft encounters during atmospheric reentry. Results provide new information about how space vehicles break up in Earth's atmosphere. This is useful for engineers designing spacecraft that would break up intentionally to avoid harming people and property, as well as spacecraft that can withstand reentry forces. The investigation also tests two new lightweight materials that can be used in heat shields on small spacecraft. The materials would be beneficial for large vehicles designed to reenter the atmospheres of Earth and Mars.

Magnetic 3-D Cell Culturing (CASIS/National Lab) uses magnetized cells and tools to make it easier to handle cells and cultures, and to improve the reproducibility of experiments. Cell cultures in space spontaneously grow in three dimensions (3D), which results in characteristics more representative of how cells grow and function in living organisms. But in microgravity, routine manipulation of cell cultures is challenging. This platform provides a way to manipulate and culture cells in 2D and 3D in space and on the ground, which can help isolate the effects of gravity in experiments and enable biological research previously deemed unfeasible in space.

ADCs in Microgravity (CASIS/National Lab) evaluates new antibody-drug conjugates (ADCs) from Oncolinx. These combine an immune-activating drug with antibodies and target only cancer cells, which increases the effectiveness of chemotherapy and reduces its side effects. In microgravity, cancer cells grow in three-dimensional, spheroid structures that closely resemble their form in the human body, allowing for better drug testing.

A test unit of NASA's Advanced Plant Habitat was delivered to the Space Station Processing Facility at NASA's Kennedy Space Center in Florida on Nov. 17. Credit: NASA/Bill White

The RED-Data2 investigation studies a new type of recording device that rides along a vehicle reentering Earth's atmosphere, providing crucial data about the extreme conditions a spacecraft encounters during atmospheric reentry. Credit: Terminal Velocity Aerospace



ADCs enable local delivery of the drug to the tumor site, thereby avoiding the toxic side effects associated with systemic chemotherapy. Credit: Oncolinx, LLC