

# **'Fire in space' experiment kicks off aboard US cargo ship (Update)**

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Orbital ATK and SpaceX have each been awarded NASA contracts worth more than one billion dollars to supply the International Space Station

How does fire act in space? Researchers will soon find out by trying to ignite nine different materials aboard an unmanned spaceship on its way to a fiery re-entry into Earth's atmosphere, NASA said Monday.

The fire experiment is the second of its kind aboard a Cygnus cargo ship

operated by the US company Orbital ATK. The first experiment took place in June.

The controlled blazes will take place aboard a vessel that left the International Space Station, packed with 1.5 tons of garbage, at 8:22 am (1322 GMT) on Monday.

Ultimately, the whole spaceship and its contents will burn up on re-entry to Earth's atmosphere at 6:30 pm (2330 GMT) Sunday.

But until then, the spaceship transforms into a test bed that aims to improve safety for astronauts living in space by helping experts better understand how fire behaves in microgravity.

"A spacecraft fire is one of the greatest crew safety concerns for NASA and the international space exploration community," said project manager Gary Ruff, part of the team working on the project known as the Spacecraft Fire Experiment, or Saffire.

Compared to Earth environments—where fire has been studied extensively in everything from mines to submarines to high-rises—little is known about how fire behaves in microgravity.

A fire broke out on the Russian space station Mir in 1997 when an oxygen-generating container erupted in flames, endangering the crew.

Cosmonauts fought the fire with extinguishers and it eventually burned out.

## **'Just light it on fire'**

The Saffire project seeks to find out if an upward spreading flame will continue to grow, or if microgravity will limit the size of the fire.

It also aims to reveal which fabrics and materials will catch fire and how they will burn.

Before any of this could be tried in space, scientists had to find a spaceship on which to stage their experiments.

With astronauts' lives at risk, not to mention expensive spacecraft components, there were no takers until Orbital offered its unmanned Cygnus, which burns up anyway on re-entry. SpaceX's Dragon cargo ship is made to return to Earth intact.

"My initial idea was just to light the trash on fire and see what happens," principal investigator David Urban told AFP.

"But for various reasons—not the least of which was I needed to get the data back—that was not quite the way we went."

Instead, an international team of researchers including the European Space Agency made nine compartments for materials to be set ablaze.

These included "flame retardant fabrics used for astronaut clothing, station Plexiglas window samples with edge variations and structures used for storage containers and silicone composites," NASA said.

Each sample is two by 11 inches (five by 28 centimeters), and is placed in a separate compartment for the fire study.

Two high-definition video cameras are placed inside, collectively filming all the samples, said Urban, chief of the combustion physics and reacting processes branch at NASA's Glenn Research Center in Ohio.

Hot wires were scheduled to ignite the first of the fires Monday afternoon.

Images and data will not arrive back on Earth until Tuesday, Urban said.

Not all of the samples are expected to ignite, said Urban. If they did, it would be "very surprising."

Another Saffire experiment is planned for early 2017.

Cygnus launched from Wallops Island, Virginia and arrived at the ISS on October 23, carrying 5,100 pounds (2,300 kilograms) of food, supplies and science experiments for the team of global astronauts living in orbit.

Orbital ATK and SpaceX have each been awarded NASA contracts worth more than \$1 billion to supply the space station.

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