

# Last European cargo ship docks with space station (Update)

August 12 2014, by Mariette Le Roux

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Europe turned a page in its space flight history on Tuesday when it delivered supplies to the International Space Station for the last time.

An automated cargo ship successfully docked with the ISS as scheduled in a precision manoeuvre broadcast live on the web.

The Georges Lemaitre automated transfer vehicle (ATV), named after the father of the Big Bang theory of how the Universe was formed, is the most complex spacecraft ever built in Europe.

It is the fifth and last such robot freighter that Europe had pledged for lifeline deliveries to the ISS, a US-led multi-national collaboration.

The ATV made contact with its target at 1330 GMT as planned at an altitude of 400 kilometres (250 miles) above the Earth and travelling at a speed of 28,800 km (18,000 miles) per hour, the European Space Agency (ESA) said.

A set of hooks then latched on to the orbiting outpost, and data and electrical connections were made to allow the ATV to draw power from the ISS and communicate with it.

"The crew will open the hatch and enter briefly over the next day, installing a fan to freshen the internal air before ATV is made ready for daily use," the ESA said.

## **Bread pudding, coffee, noodles**

Weighing in at more than 20 tonnes, the double decker bus-sized craft brought the biggest-ever payload of more than 6.6 tonnes, including fuel, water, oxygen, food, clothes and scientific experiments for the six ISS crew.

After unloading its cargo, the 10-metre (33-foot) pressurised capsule will provide additional living and working space for the astronauts and use its onboard engines to boost the altitude of the space station, which loses height through atmospheric drag every day.

Included in its payload are 850 litres of drinking water—the most ever—and three tonnes of fuel.

Many of the 1,232 items on board bring home comforts to the astronauts who spend half-a-year at a time in tough, weightless conditions.

They will receive bread pudding, orange and mango juice, cheese noodles, dental floss and crucially, 50 kilogrammes of coffee to "rejuvenate" the crew, said ATV-builder Airbus Defence and Space.

With no washing machine in space, the robot craft also brings clean underwear and socks, as well as scientific experiments.

At the end of its six-month mission, filled with garbage and human waste, the spacecraft will undock and burn up in a controlled re-entry over the South Pacific.

## **Historic demise**

The Georges Lemaitre will make history with its fiery death—for the

first time an ATV will make a shallow reentry into the atmosphere, paving the way for the ISS' own demise scheduled for 2024, said the ESA.

Due to its much larger size, there is a risk that ISS fragments will bounce back into space off the atmosphere if it enters too straight, and so the ATV will provide important data on the optimal angle to be used—filmed by an onboard camera in another first.

The 10-metre (33-foot) pressurised capsule was the heaviest ATV ever launched by an Ariane 5 ES rocket, following on the hi-tech trail of four others sent into space by the ESA since 2008.

Since the US space shuttle was retired in 2011, the ATV had the largest cargo capacity of all vehicles resupplying the orbiting outpost.

Although the Georges Lemaitre will meet an abrupt end, its technology will live on: ATV-derived hardware is to be included in the design for NASA's Orion spacecraft, which will take humans to the Moon and beyond, and is scheduled for a test flight in 2017.

The ISS will in future be resupplied by Russia's Progress freighter and the Dragon and Cygnus craft built by two NASA-contracted private American firms—Space X and Orbital Sciences.

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