First additively-manufacture thermal protection shield is going to space

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Northrop Grumman's Cygnus spacecraft atop the company's Antares rocket lifts off Feb. 20, 2021, to deliver important science and cargo to the International Space Station on the company's 15th commercial resupply services mission for NASA. Credits: NASA

A research team at Oak Ridge National Laboratory have 3D printed a thermal protection shield, or TPS, for a capsule that will launch with the

Cygnus cargo spacecraft as part of the supply mission to the International Space Station. The launch will mark the first time an additively manufactured TPS has been sent to space.

Scientists worked with NASA to develop materials designed to withstand extreme temperatures encountered when objects reenter the atmosphere. The TPS protects a basketball-sized capsule that was developed by the University of Kentucky as a testbed for entry system technologies.

"This is an opportunity to gain flight experience on new materials," ORNL's Greg Larsen said. "Additive manufacturing enables automated, rapid production and opens up new design opportunities for using lightweight materials in spacecraft."

Equipped with sensors that record and transmit data to monitor performance, the capsule is anticipated to return to earth before the end of 2021.

More information: Launch announcement: www.nasa.gov/press-release/nas … launch-from-virginia

Provided by Oak Ridge National Laboratory

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