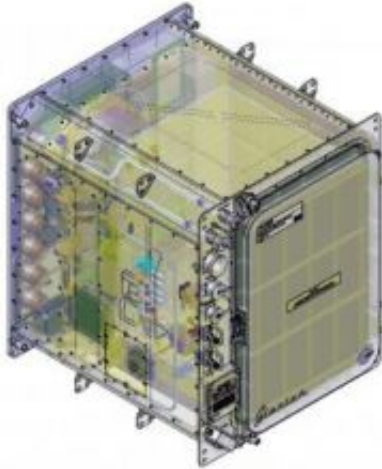


# Compact research freezers to debut in space

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Space-bound cryogenic freezers. Credit: UAB CBSE

When the space shuttle Endeavour lifts off this month, its flight crew will be taking new research equipment designed and built by the University of Alabama at Birmingham (UAB).

Aboard the flight is a pair of cryogenic freezers from the UAB Center for Biophysical Sciences and Engineering (CBSE) that will boost the biological research capacity of the shuttle and the International Space Station (ISS).

Capable of minus 160 degrees Celsius, the small, portable freezers can hold laboratory trays, test tubes and various research containers used in biology, chemistry, physics, medicine and other space-based

experiments, CBSE engineers said.

The freezer design is called GLACIER, for General Laboratory Active Cryogenic ISS Experiment Refrigerator. This Endeavour flight is the first space travel for the GLACIER project, part of a National Aeronautics and Space Administration contract awarded to the UAB CBSE in 2005.

"We've worked a long time and with many talented people to incorporate miniaturized freezer components to make this project work," said David Ray, the CBSE project manager for GLACIER. "It was a challenge to get the electrical, cooling and other factors in place, and still have a freezer that carries 10 kilograms of sample mass inside."

The compact, low-power cryogenic freezers are approved for transport and storing biological research samples on shuttle flights and the ISS. Of these first two GLACIERs to enter orbit, one freezer is bound for the ISS and the second will remain aboard Endeavour to take biological research samples back to Earth.

New cryogenic transport and efficient storage comes at a crucial time when the volume and complexity of space-based bioresearch has outpaced older lab equipment, said Dan Connor, a CBSE project manager.

"Today the United States, Japan and the Europe all have labs on the space station, and they're all doing groundbreaking science. There is a huge demand to store all this biomaterial until you can examine it, process it or carry it back to Earth, and that's where GLACIER fits in," Connor said.

The freezers have gone through rigorous quality review, including repeated vibration, acoustic, electrical and toxicity testing at Marshal

Space Flight Center in Huntsville.

UAB first became involved in space-bound freezers in the 1990s when Lawrence DeLucas, Ph.D., CBSE director and former NASA astronaut, began flying protein crystal growth experiments aboard space shuttles. Today, the CBSE is a leading life sciences and engineering lab that offers a range of discovery, design and manufacturing services.

Source: University of Alabama at Birmingham

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