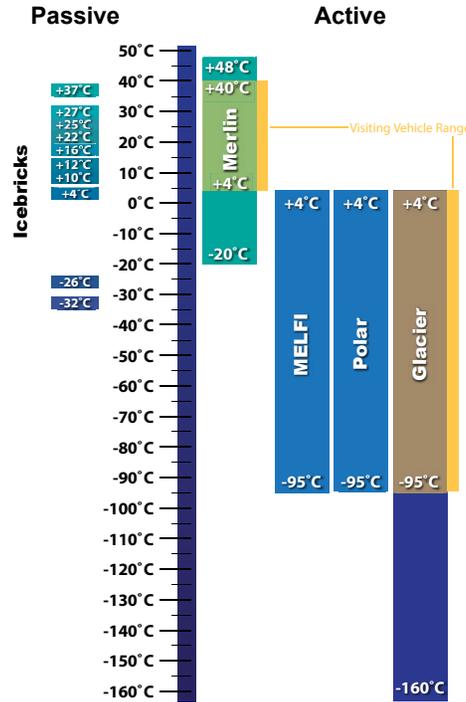


WHY ARE WE HERE?



NASA's vision for humans pursuing deep space flight involves the collection of science in low earth orbit aboard the International Space Station (ISS). As a service to the science community, Johnson Space Center (JSC) has developed hardware and processes to preserve collected science on the ISS and transfer it safely back to the Principle Investigators. This hardware includes an array of freezers, refrigerators, and incubators.

APPLICABLE TEMPERATURE RANGES BY HARDWARE



National Aeronautics and Space Administration



COLD STORAGE

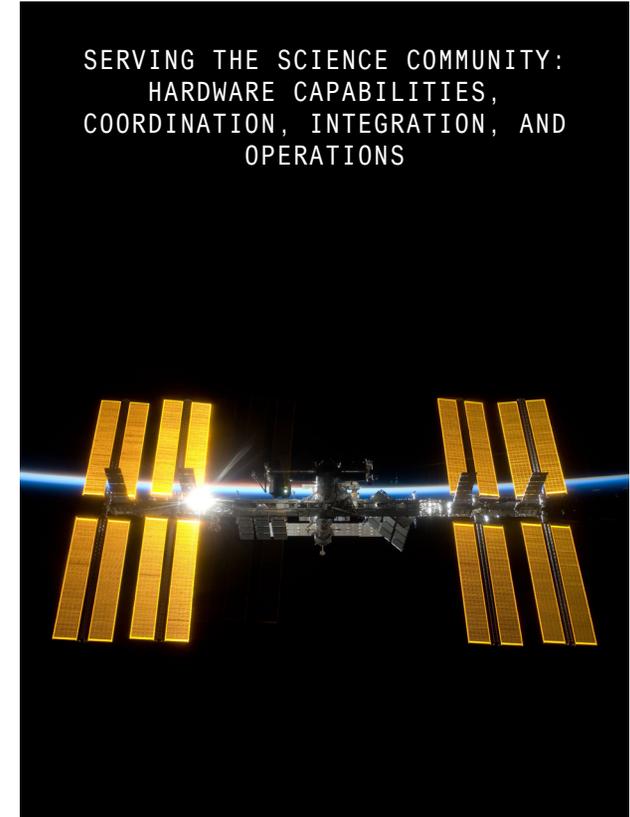
AN INTERNATIONAL SPACE STATION PROJECT



WHAT IS COLD STORAGE?

The Cold Storage team is part of the International Space Station (ISS) program. JSC manages the operation, support and integration tasks provided by Jacobs Technology and the University of Alabama Birmingham (UAB).

Cold Storage provides controlled environments to meet temperature requirements during ascent, on-orbit operations and return in relation to International Space Station Payload Science.



HOW DO I REQUEST COLD STORAGE?

Payload Developers (PD's) use an ISS Program tool, OZ (Payload Office) Requirements Baseline and Integration Tool (ORBIT), to request Cold Storage support by filling out a Cold Storage Form. ORBIT can be accessed at the following website:



<https://orbit.iss.nasa.gov/>



CONTACT US

Email:



jsc-coldstorage@nasa.gov

For more information on Cold Storage, including existing Cold Storage Forms, a current Cold Storage Plan, and to request Cold Storage Testing, visit the following website:



<https://isswww.jsc.nasa.gov/nwo/payload/oz2/web/ColdStow.shtml>

National Aeronautics and Space Administration

Johnson Space Center
2101 E. NASA Parkway
Houston, TX 77058
www.nasa.gov/centers/johnson

www.nasa.gov

The Cold Storage team is dynamic, and provides integration/support to PDs through launch, on-orbit operations, and landing.

In most cases, Cold Storage assistance doesn't end until the science has been safely handed over to the PD.

Please contact us and find out how Cold Storage can help make your experiment even cooler.



ACTIVE HARDWARE

MELFI

The Minus Eighty degree Laboratory Freezer for the International Space Station (MELFI) is a refrigerator/freezer used to preserve science samples on the ISS. MELFI has four insulated dewars which can be set independently to +2°C, -35°, or 95°C.

There are currently 3 units on the ISS.



GLACIER

The Glacier is a double middeck locker-sized cryogenic freezer. The primary function of Glacier is to provide cryogenic preservation of science samples aboard the ISS and thermal control in visiting vehicles.

Glacier is designed to support experiments that require temperatures between -95°C and +4°C for launch/return and -160°C to +4°C on ISS.



POLAR

Polar is a single middeck locker-sized cryogenic freezer. The primary function of Polar is to provide cryogenic preservation of science samples aboard the ISS

and thermal control in visiting vehicles. Polar is designed to support experiments that require temperatures between +4°C and -95°C.



MERLIN

MERLIN is a single middeck locker-sized incubator/fridge/freezer. The primary functions of MERLIN are to provide temperature-specific environments for samples aboard ISS and thermal control in visiting vehicles. MERLIN is designed to support experiments requiring temperatures between +4°C and +40°C for launch/return, and -20°C to +48°C on ISS.



PASSIVE HARDWARE

DOUBLE COLDBAG



Double Coldbags (DCBs) have highly insulated walls, and are designed to carry payload science at controlled temperatures by utilizing Phase Change Material (PCM) to maintain specific temperatures for a prolonged period of time. The DCB is rectangular and fits in a single mid-deck locker. It is commonly used to transport science to and from the ISS on visiting vehicles.



Flying experiments on the International Space Station is a unique opportunity to eliminate gravity as a variable and provide exposure to vacuum and radiation

MINI COLDBAG

Mini Coldbags (MCBs) are similar to DCBs, but are significantly smaller.

This coldbag has been optimized for return on a Soyuz vehicle. The MCB can also be used within the Microgravity Science Glovebox (MSG) as a means to immediately begin cooling samples after collection.



ICE BRICKS

Ice Bricks are designed to provide cooling or incubation to scientific specimens requiring specific temperature ranges during transport to/from the ISS. They are designed to work with other insulated transporters (e.g. DCB, MCB)



to maintain specific temperatures between -32°C and +37°C. Ice Bricks are reconditioned using active hardware (MELFI, Glacier, Polar, MERLIN).

COLD STORAGE LAB

The Cold Storage Lab is located at JSC in Building 7, Room 2004. Hold tests, fit checks, and thermal tests can be performed by request within the lab. Equipment



in the lab allows the Cold Storage team to test articles at temperatures ranging between -152°C to +200°C. Cold Storage also utilizes a lab at Kennedy Space Center (KSC). The lab at KSC is used for active hardware processing, passive hardware conditioning, and payload turnover in support of Visiting Vehicle missions.