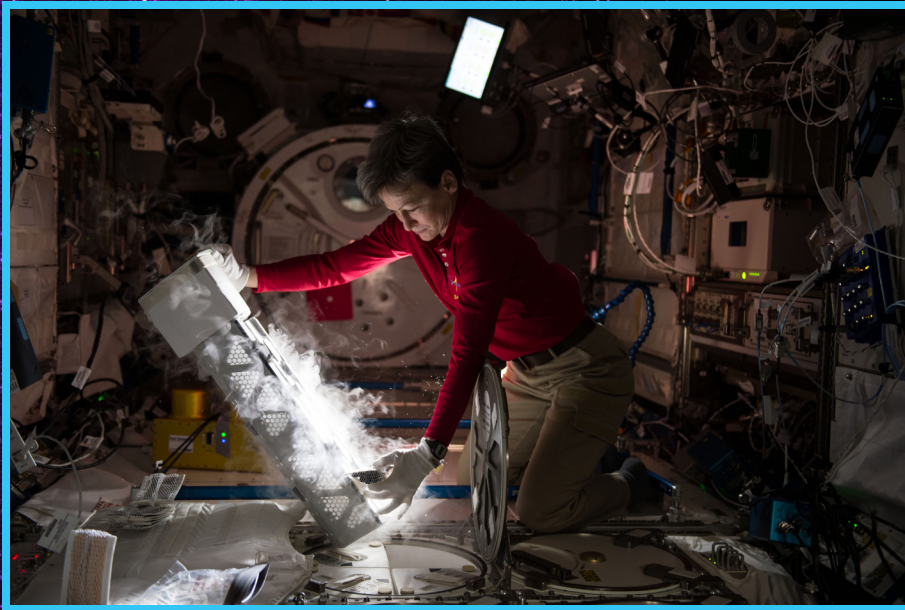


# COLD STOWAGE LAB

The Cold Stowage Lab is located at JSC. Hold tests, fit checks, and thermal tests can be performed by request within the lab. Equipment in the lab allows the Cold Stowage team to test articles at temperatures ranging between -196°C to +200°C. Cold Stowage also utilizes labs at Kennedy Space Center (KSC) and other vehicle processing locations. The labs are used for active hardware processing, passive hardware conditioning, and payload turnover in support of Visiting Vehicle missions.



## REQUESTING COLD STOWAGE

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

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

## CONTACT US

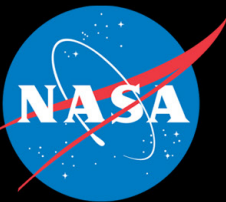
The Cold Stowage team is dynamic and provides integration and support to PDs through launch, on-orbit operations, and landing. In most cases, Cold Stowage assistance doesn't end until the science has been safely handed over to the PD.

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

For more information on Cold Stowage, including existing Cold Stowage forms and to request Cold Stowage testing, visit the following website:

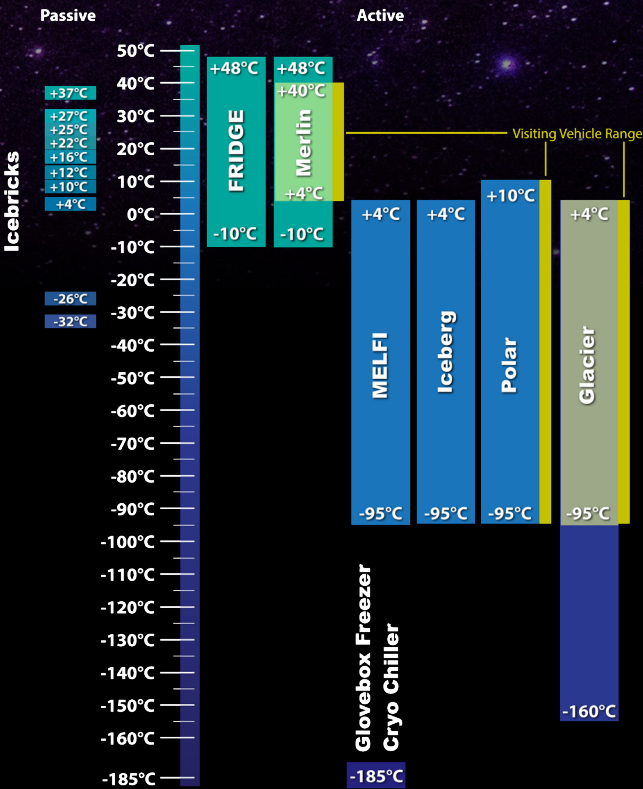
<https://iss.sp.jsc.nasa.gov/Int/OB/CarrierPayload/coldstowage/SitePages/Home.aspx>

E-Mail: [jsc-coldstowage@nasa.gov](mailto:jsc-coldstowage@nasa.gov)



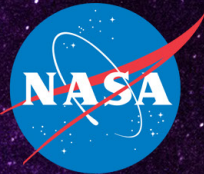
National Aeronautics and Space Administration  
Johnson Space Center  
2101 E. NASA Parkway  
Houston, Texas 77058  
[www.nasa.gov/centers/johnson](http://www.nasa.gov/centers/johnson)

### APPLICABLE TEMPERATURE RANGES BY HARDWARE

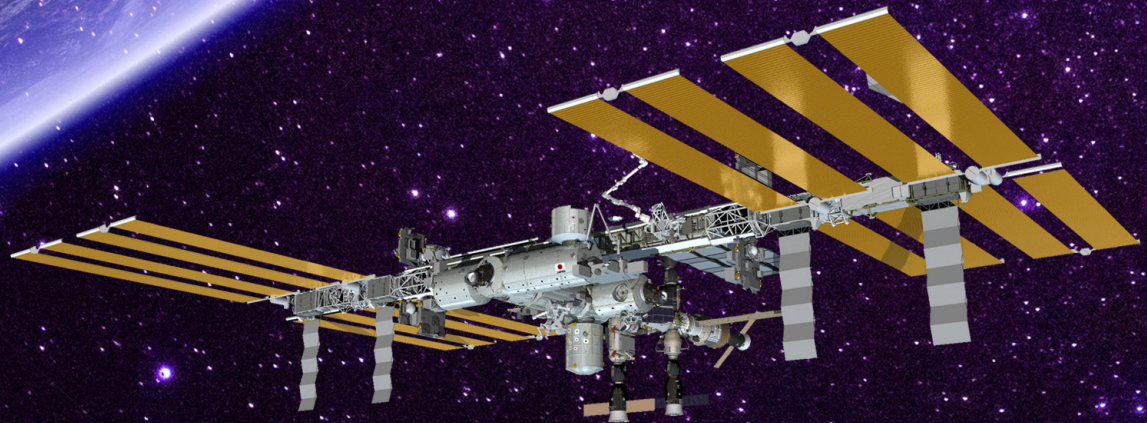


[www.nasa.gov](http://www.nasa.gov)

National Aeronautics and  
Space Administration



# COLD STOWAGE AN ISS PROJECT





# SERVING THE SCIENCE COMMUNITY

## ABOARD THE INTERNATIONAL SPACE STATION

### WHAT IS COLD STOWAGE?

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 to provide conditioned stowage capabilities.

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

### 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.



#### Mini Coldbag

Mini Coldbags (MCBs) are similar to DCBs, but are significantly smaller. The MCB is primarily used on ISS within a Glovebox as a means to immediately begin cooling samples after collection.

#### Ice Bricks

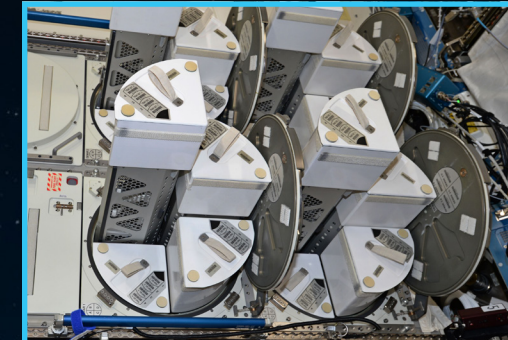
Ice Bricks are designed to provide cooling or incubation to scientific specimens requiring specific temperature ranges during transport to/from the ISS. They are designed to work with other insulated transporters (e.g. DCB) to maintain specific temperatures between -32°C and +37°C. Ice Bricks are reconditioned using active hardware (MELFI, Iceberg, Glacier, Polar, MERLIN).

### 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.



#### Iceberg

The Iceberg is a double middeck locker-sized freezer. The primary function of Iceberg is to provide cryogenic preservation of science samples aboard the ISS. Iceberg is designed to support experiments that require temperatures between -95°C and +4°C on ISS.

#### 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 -10°C to +48°C on ISS.



#### Rapid Freeze

The Glovebox Freezer and Cryo Chiller provide the capability to rapidly freeze science samples at rates approaching those of Liquid Nitrogen on the ground. Samples are frozen via a conduction interface at -185°C. The Glovebox Freezer is designed to be used inside the Microgravity Sciences Glovebox (MSG) and Life Sciences Glovebox (LSG). The Cryo Chiller is a single middeck locker-sized freezer that resides in an EXPRESS rack on orbit.



#### 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 -95°C and +10°C.

