Contact

Subzero Research Laboratory

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Location: 205 Cobleigh Hall

MONTANA STATE UNIVERSITY
Mountains & Minds

SUBZERO
RESEARCH LABORATORY

A world-class suite of lab facilities for research on cold regions and cold materials

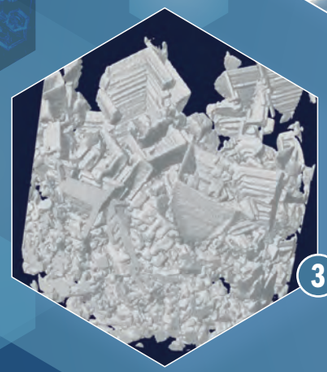
- Snow microstructure and avalanche mechanics
- Antarctic ice and extreme biology
- Road de-icing and transportation infrastructure
- Available for a wide range of cold science

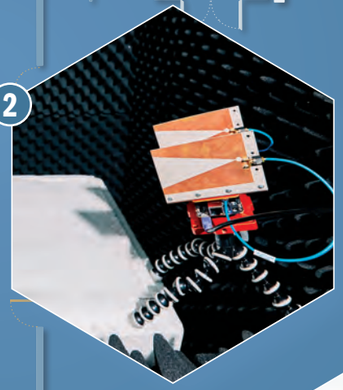
About the lab

The Subzero Research Laboratory is one of only a few specialized facilities in the world dedicated to snow science and other cold research. Occupying 2,700 square feet in MSU's Cobleigh Hall, this state-of-the-art suite of laboratories includes eight cold rooms, three low-temperature biological incubators and a variety of unique tools and capabilities.

Housed in the Department of Civil Engineering in MSU's Norm Asbjornson College of Engineering, the lab is rooted in MSU's long history of snow science. In the early 1970s, MSU engineers and earth scientists partnered to pioneer research on snow structure and avalanche safety. The Subzero lab was established in 2008 with $2 million from the National Science Foundation, the Murdock Charitable Trust and other funders.

The Subzero lab continues to be instrumental in making discoveries about Antarctic microbes, snowpack metamorphism and much more. Paired with Bozeman's cold winters and mountainous surroundings, the Subzero lab positions MSU to remain one of the world's leading institutions for cold research and education.





Facilities and equipment

1 Environmental Chamber 1
Features solar simulation, humidity control and variable radiative temperature in floor and ceiling for a general-purpose chamber supporting experiments in snow metamorphism, avalanche mechanics and more.

2 Environmental Chamber 2
The coldest chamber at Subzero Lab, capable of sustaining temperatures as low as -60C. In-place gloves allow researchers to handle equipment from outside of the chamber.

3 Materials Preparation and Characterization Chamber
Contains a variety of equipment for preparing and analyzing ice and snow samples, including a powerful microCT device.

4 Cold Hydrodynamics Chamber
This chamber allows researchers to study systems with liquid water in a controlled cold environment that includes a programmable solar simulator in the ceiling and a snow-making device.

5 Class 1000 Clean Room
The clean room provides a contaminant-free space for processing pristine ice core samples and conducting microbial experiments.

6 Cold Specimens Storage Room
Cold chamber with redundant refrigeration system provides assured long-term storage for ice cores and other frozen samples.

7 Structural Testing Chamber
Concrete floor with bolt-downs allows for experiments involving applied force to materials under variable cold conditions. Ideal for studying the durability and other characteristics of materials such as concrete in low temperatures.

8 Cryostage Microscope Room
Non-cold room houses multiple specialized, powerful microscopes with localized temperature control.

9 The Bridge
It's not all cold. Work stations, computers and windows into the chambers combine to make for an efficient workspace and staging area.

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