

# Black Hills State University Underground Campus

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## Content

The Black Hills State University Underground Campus (BHUC) is a multidisciplinary facility located at the 4850 foot level of the Sanford Underground Research Facility (SURF) in Lead, SD. The 4300 m.w.e. overburden provides a substantial reduction in cosmic ray muon-related backgrounds in sensitive detectors underground. Located within the BHUC is a 600 sq. ft., class 1,000 cleanroom dedicated to low background counting. Amenities of the cleanroom include vacuum-jacketed piping for liquid nitrogen running along the wall, serving each low background counting station with remotely-controlled solenoid valves and an autonomous LabVIEW fill program. Each counting station is also provided with nitrogen for purging, electrical outlets and data connections. Personnel from Black Hills State University (BHSU) are on-site to provide assistance with the maintenance and operation of detectors for remote users.

Since the completion of the BHUC in August 2015, three high purity germanium (HPGe) low background counting stations have been installed, with five more expected by the end of the year. It is anticipated that the BHUC will house up to twelve HPGe counters and small scale R&D efforts. In addition to HPGe counters, an XIA alpha counter is expected to move underground and one user group is pursuing funding for a beta counter. An Inductively Coupled Plasma Mass Spectrometry (ICP-MS) system rounds out the capabilities, located just 20 miles away at the BHSU above-ground campus. The BHUC is a user facility and open to accepting new counting stations as space allows, including opportunities for R&D testing and small scale experiments in a deep underground clean room.

A collaboration of BHUC low background counter owners is being formed to organize and simplify incoming counting requests and share resources amongst users of the facility. While the collaboration is currently concentrated on particle astrophysics samples, it is open to counting samples for any application. This talk will provide a detailed overview of the facility and the network of counting services that this facility seeks to provide the low background community at large.

## About the Presenter

Dr. Brianna Mount is research faculty at Black Hills State University and the lab director of the BHSU Underground Campus. She also runs an ICP-MS lab at the above-ground BHSU campus, located just 20 miles away from the Sanford Underground Research Facility.

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