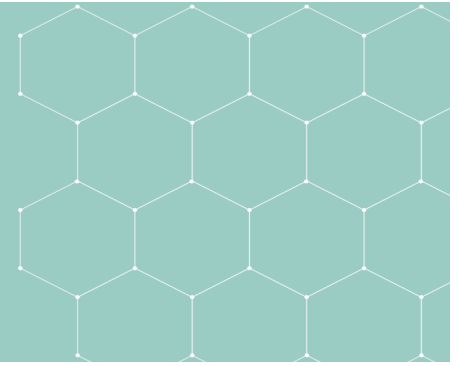




# PHYSICS

## COLORADO STATE UNIVERSITY



### **CSU PHYSICS COLLOQUIUM**

**The Super Cryogenic Dark Matter Search detectors:  
pushing to lower thresholds in search of an answer**

**Dr. Amy Roberts**

**University of Colorado—Denver**

Monday, April 23rd at 4:00p.m.  
120 Engineering (Hammond Auditorium)

#### **Abstract**

A wealth of cosmological measurements suggest that non-luminous "dark matter" makes up approximately 80% of all matter. So far, the effects of dark matter have only been observed gravitationally. But direct-detection experiments like the Super Cryogenic Dark Matter Search (SuperCDMS) are designed to be sensitive to a hypothesized - but not yet observed - dark matter particle.

This talk will give an overview of the SuperCDMS direct-detection dark matter search, which uses cryogenic semiconductor detectors instrumented with phonon sensors, with an emphasis on designing detectors customized for low-mass dark matter reach. As detector sensitivity steadily improves but yields no confirmed dark matter signal, interest has increased in looking for lighter-mass dark matter candidates. Searching for lighter-mass particles means lowering detector thresholds, sometimes to the eV scale, and I will discuss how the SuperCDMS detectors operate in a low-threshold mode and some of the challenges and possible solutions in the low-energy regime.

