

# Physics Colloquium

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## **Title:** The Cryogenic Dark Matter Search

**Abstract:** Observations of galaxies, superclusters, distant supernovae and the cosmic microwave background radiation, tell us that about 85% of the matter in the universe is not made of ordinary atoms. Deciphering the nature of this dark matter is of central importance for cosmology, astrophysics, and high-energy particle physics. A leading hypothesis is that this dark matter is comprised of Weakly Interacting Massive Particles, or WIMPs, that were produced moments after the Big Bang. If WIMPs are the dark matter, then their presence in our Milky Way may be detectable via scattering from atomic nuclei in a terrestrial detector. The lightest supersymmetric particle (LSP) is an excellent WIMP candidate and is within reach for many models of supersymmetry for both the LHC and direct detection experiments over the next five years, providing a deep complementarity.

The Cryogenic Dark Matter Search (CDMS) Collaboration, has pioneered the use of low temperature phonon-mediated detectors to detect the rare scattering of WIMPs on nuclei and distinguish them from backgrounds. We will describe this powerful technology, which is operating deep underground in the Soudan mine in Minnesota, and compare this approach with new noble liquid techniques that have made recent advances. We also describe the new SuperCDMS 25 kg Experiment which is underway and which will provide an additional factor of 15 in sensitivity by the end of 2012.

**Monday October 29, 2007 4:10-6PM - Room 55 Roessler**