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# The SuperCDMS SNOLAB Experiment

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Various forms of astrophysical evidence indicate the existence of Dark Matter (DM) which is predicted to account for about 85% of the matter in the universe. Our solar system moves through the hypothesized DM halo in our galaxy and many experiments pursuing different detection approaches are trying to observe the resulting DM particle flux.

Among them, SuperCDMS is a direct detection DM experiment presently being constructed at the SNOLAB underground facility in Sudbury, Canada. It will make use of cryogenically cooled Germanium and Silicon crystals equipped with sensors in different designs, which are interleaved Z-dependent Ionization and Phonon (iZIP) detectors and High Voltage (HV) detectors. The iZIP detectors can measure both ionization and phonon signals, allowing the distinction between electron recoils and nuclear recoils. While the former is typically induced by background events, the latter can be caused by DM particles, in particular so called WIMPs. With that recoil discrimination ability, a separation between background and signal is possible which helps to improve sensitivity for WIMPs. HV detectors operate with a larger voltage bias in order to accelerate charge carriers created by ionization, and only measure the resulting amplified phonon signal. Despite not having recoil discrimination ability, it empowers a much better resolution and a comparatively low energy threshold that opens the DM search to lower mass regions.

Ultimately, the complementary approach of the different crystal materials and detector designs enables a broadband DM search for particles with masses $\leq 10$ GeV/c$^2$, scanning the parameter space down to unprecedented cross sections.

This talk will cover the current status of the SuperCDMS experiment, explain the detector designs and their working principles, and present discovery prospects at SuperCDMS SNOLAB.

## Keyword-1

Dark Matter

## Keyword-2

Cryogenic detectors

## Keyword-3

**Primary authors:** ZATSCHLER, Birgit (University of Toronto); SUPERCDMS COLLABORATION

**Presenter:** ZATSCHLER, Birgit (University of Toronto)

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