

Erica Caden – Colloquium Seminar – October 10, 2024  
SNOLAB

Title: SNOLAB: Advancing Neutrino Physics and Equity in Science

Abstract: SNOLAB, an advanced underground research facility located 2 km beneath the surface in Sudbury, Ontario, is at the forefront of exploring fundamental questions in particle physics, astrophysics, and cosmology. One of the key scientific endeavors at SNOLAB is the study of neutrinoless double beta decay ( $0\nu\beta\beta$ ), a rare nuclear process whose detection could shed light on the nature of neutrinos, including whether they are Majorana particles (i.e., their own antiparticles). This discovery would profoundly impact our understanding of the universe, offering insight into the origin of matter and the asymmetry between matter and antimatter. SNOLAB will host two experiments dedicated to this search: SNO+ and nEXO. These experiments leverage cutting-edge detector technologies and operate in SNOLAB's low-background environment to achieve the sensitivity necessary to explore this rare decay. They use different isotopes and different detection methods, to compliment the global search for this reaction. The current status of both projects will be discussed.

The significance of SNOLAB extends beyond its scientific achievements. Like many large-scale international facilities, SNOLAB's community is committed to fostering Equity, Diversity, and Inclusion (EDI) within its teams. These initiatives aim to address historical inequities in science and promote a culture where diverse voices can contribute meaningfully to groundbreaking research. EDI efforts at SNOLAB will be discussed in the context of encouraging scientific collaborations to be more innovative, equitable, and sustainable.