



CO-OP Undergraduate STUDENT

SNOLAB Research Division

Summer Term May- August 2022

About Us

SNOLAB is an international facility for world-class underground physics research and has an expanding programme in astroparticle physics and underground science. Located in an air-conditioned clean room 2 km underground in the Vale Creighton Mine near Sudbury Ontario, with a suite of surface facilities and laboratories, SNOLAB is currently preparing for the next generation of experiments focusing on neutrino studies and the search for galactic dark matter.

The Position

Astroparticle physics experiments searching for rare events, such as neutrinoless double beta decay and dark matter particle interactions, have to be shielded from background radiation and have to exhibit a radioactive background as low as reasonably achievable. The material selection for the next generation of low-background experiments is becoming crucial to inform the final design of the shielding scheme and to estimate the ultimate background rate in the energy region of interest of the experiments.

The XIA UltraLo1800 alpha detector allows a non-destructive screening of large surfaces. In fundamental physics experiments, such as neutrino and rare decay measurements, it is critical to minimize the number of background events that arise from alpha particle emitted by the natural radioactivity in the materials used to construct the experiment. The control of the contamination induced ^{222}Rn and its progenies in the environment where detectors are assembled and stored is thus a crucial issue.

The SNOLAB material screening and assay program allows the direct measurement of the experimental background sources. The student will be involved in the data analysis and acquisition of material samples counted in the detector, currently located in a clean room at the SNOLAB surface building.

Improved sensitivity to surface alpha contamination should be achieved bringing the alpha counter 2km underground at the SNOLAB underground laboratory. Sensitivity can reach level better than one order of magnitude than on surface, as demonstrated at YangYang Laboratory. The student will play an active role in studying the sensitivity gain via MonteCarlo simulations and in moving the XIA UltraLo1800 detector underground at the SNOLAB underground laboratory. A first re-commissioning underground is needed to set the sensitivity standard level. The increased sensitivity level in alpha contamination will allow a qualitative material screening to inform for instance the final design of future experiments.



📍 Creighton Mine #9, 1039 Regional Road 24, Lively, ON P3Y1N2

☎ 705.692.7000 🌐 www.snolab.ca

Criteria

Education:

Applications from any undergraduate levels are accepted.

Must be 18 years or older, registered in post-secondary studies at an accredited institution or apprenticeship program, recent graduate (having graduated in the last 3-6 months) or individual returning to full-time or part-time studies in the next academic term.

Experience:

Expertise in data analysis, statistics and modern programming languages is required, ideally in the frame of C++, ROOT and Python. Experience working in a cleanroom laboratory is an advantage.

Salary Range:

Salary will be determined by education and qualifications. These positions are subject to availability of funding. To meet operational needs, shift work may be required.

To Apply:

Applications must be submitted to silvia.scorza@snolab.ca and studentjobs@snolab.ca.

Please do not fax or mail your applications. By applying to the e-mail address, your application becomes available to Research Scientists/Managers immediately. Interested students should include a cover letter and resume in a unique pdf file, named as "StudentName_Project_AcademicYear_HomeInstitution".

For more details on this specific project, please contact Dr. Silvia Scorza via email silvia.scorza@snolab.ca

Closing Date

Deadline to Apply: January 15 to February 1

The posting will remain open until the position is filled, but review of applications will commence on January 15th, 2022. SNOLAB thanks all applicants for their interest, however, only those students considered for an interview will be contacted.

SNOLAB is committed to equity in employment and encourage applications from all qualified applicants, including women, Indigenous persons, members of visible minorities and persons with disabilities. In accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents.

SNOLAB will provide support in its recruitment processes to applicants with disabilities, including accommodation that takes into account an applicant's accessibility needs.

Further information about SNOLAB may be found at www.snolab.ca

Posting Date: January 11, 2022



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