Summer Undergraduate STUDENT - Modeling Laboratory Instrumentation to Predict Future Needs

SNOLAB Research Division
Summer Term (May – August 2023)

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

SNOLAB itself generates an immense amount of information through active monitoring of its many systems. Climate, atmosphere, and other data are collected on an ongoing basis. Projects sited in the underground laboratory rely on this monitoring to make informed decisions. For example, oxygen levels must be monitored in certain parts of the laboratory where other gases are used that could leak or vent into the surrounding volume. The energy usage by the laboratory, and its heat output, are critical in planning for the addition of future projects and personnel in the laboratory.

Data are generated by instrumentation and then collected and made available for visualization and analysis using a PI Server. This server has its own tools for further utilization of the data and can be interfaced using a third-party toolkit (e.g., Python libraries). An open research questions is whether there is sufficient information in the available data streams to anticipate future events for the laboratory, such as the imminent failure of critical equipment or the scalability of existing infrastructure.

The successful candidate will engage in a project to utilize data from sensors and instrumentation in SNOLAB to build models that would allow the anticipation of future needs. A key aspect of this project will be to obtain and handle the data (from the PI server architecture), develop approaches to interpret it and construct predictive frameworks from that effort (e.g., using the Python programming language), and then apply those frameworks to past data to validate the predictive power. The goal is to develop useful models of key components or systems by combining data science and physics.

Criteria

Education:

Applications from undergraduates at any level of their education 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:

Experience in basic data analysis, including data formatting, statistics, and computer programming is required. Knowledge of specific programming languages, such as Python, is an asset. Candidates should be comfortable working in a team environment where frequent and open communication are encouraged and expected as part of the culture. Any additional experience working in a laboratory environment, especially a cleanroom environment, is also an asset.

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 stephen.sekula@snolab.ca and to studentjobs@snolab.ca as well: it will be added to a pool seen by the other Research Scientists/Managers and could be selected for other jobs. **Please do not fax or mail your applications.** The application will include a cover letter and resume in a **single** PDF file with the name:
<Name>_<ProjectApplying>_<AcademicYear>_<HomeInstitution>.pdf

Closing Date

Deadline to Apply: January 15 to February 1, 2023

The posting will remain open until the position is filled, but review of applications will commence on February 1, 2023. 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 9, 2023