

Department of Physics
University of Toronto
JOB POSTING – POSTDOCTORAL FELLOW

Area of Research: Experimental Astroparticle Physics

Description of duties: A postdoctoral fellowship position is available in the University of Toronto SuperCDMS group.

SuperCDMS is a direct-detection experiment that looks for interactions of dark matter in cryogenic germanium and silicon detectors equipped with sensors for the thermal energy of particle interactions. The SuperCDMS Collaboration has an illustrious history of world-leading dark matter results; the next generation of the experiment, featuring novel detector upgrades, is currently being installed in SNOLAB, Canada's premier astroparticle physics facility located 2 km below the surface in the Vale Creighton Mine near Sudbury. The elite international collaboration aims for world-leading sensitivity to a variety of dark matter candidates and masses over the next decade. The chief advantage of SuperCDMS's cryogenic technology is the extremely low detection thresholds achievable, while SNOLAB provides a low-background environment.

The Toronto SuperCDMS group is led by Prof. Miriam Diamond, Prof. Ziqing Hong, and Prof. Pekka Sinervo, and has active roles in all aspects of the experiment. The joint group collaborates closely with the SuperCDMS group at SNOLAB on a daily basis for the operation of the Cryogenic Underground TEst (CUTE) facility to support detector development and characterization, as well as the commissioning of the SuperCDMS SNOLAB experiment. The group also operates a local cryogenic facility for detector calibration efforts. On the software side, the group participates in data acquisition, data quality monitoring, Monte Carlo detector simulation, and data analysis..

The successful applicant will be based in Toronto, with frequent trips to Sudbury for on-site shifts at SNOLAB. Tasks performed in Toronto will include remotely monitoring data quality in real-time for SuperCDMS SNOLAB and CUTE, leading the offline analysis of the data, leading large-scale production campaigns of simulated detector data, and performing simulations to investigate background sources and detector response. Additional duties for the collaboration will consist of organizing meetings, documenting software, and reviewing and authoring internal reports as well as published papers.

This is an exciting time to join the collaboration: hands-on involvement with various aspects of the experiment right from the start of SNOLAB data-taking. It is also an exciting time for the dark matter search field in general, with discovery potential for a range of models to finally resolve the longstanding questions at the forefront of modern astroparticle physics.

Salary: Determined based on research experience

Required Qualifications:

- Ph.D. in experimental particle physics, experimental astrophysics, or other related research areas, by the time of the appointment.
- Strong record of accomplishments in experimental physics.
- Excellent oral and written communication skills as demonstrated by presentations at conferences and a record of publication(s) in peer-reviewed journals.
- Strong coding skills.
- Ability to descend the SNOLAB mineshaft and traverse the mine tunnels.
- Experience with cryogenic experiments is preferred.
- Experience with large-scale detector simulations and high-performance computing systems is preferred.

Application instructions: All individuals interested in this position must submit a CV, a publication list, and a short statement of research interest to m.diamond@mail.utoronto.ca with the subject line “Postdoctoral Fellow – Experimental Astroparticle Physics” by the closing date. At least three letters of reference should also be sent directly by the referees to this address by the closing date.

Closing date: Review of applications will commence on 1 March 2024, and the opportunity will remain available until filled.

Supervisor: Assistant Prof Miriam Diamond

Expected start date: June 1 2024, flexible

Term: Two (2) years, with the possibility for extension considered on a yearly basis thereafter

FTE: This is a full-time position, and will require flexible scheduling to accommodate evening or overnight shifts for data-taking. The normal hours of work are 40 hours per week for a full-time postdoctoral fellow (pro-rated for those holding a partial appointment) recognizing that the needs of the employee’s research and training and the needs of the supervisor’s research program may require flexibility in the performance of the employee’s duties and hours of work.

Travel: Frequent travel to Sudbury, by automobile or commercial air carrier, will be required. Additional travel to other destinations (domestic and international) for conferences and workshops will be optional.

Employment as a Postdoctoral Fellow at the University of Toronto is covered by the terms of the CUPE 3902 Unit 5 Collective Agreement.

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The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from racialized persons/persons of colour, women, Indigenous / Aboriginal People of North America, persons with disabilities, LGBTQ2S+ persons, and others who may contribute to the further diversification of ideas.