

Professor Diamond in the University of Toronto Physics Department (<https://www.physics.utoronto.ca/members/diamond-miriam/>, <https://mcdonaldinstitute.ca/miriam-diamond/>) seeks a third- or fourth-year Computer Science undergraduate student with Game Design expertise to join her SuperCDMS group next summer. SuperCDMS (Cryogenic Dark Matter Search) is a world-leading 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 clean, well-shielded detectors are operating deep underground, to avoid interference from cosmic rays. SuperCDMS operated in an underground laboratory in Soudan, Minnesota until 2015. Now, the collaboration is building an even more powerful version of the experiment in SNOLAB, Canada's world-leading astroparticle physics facility located 2 km below the surface in the Vale Creighton Mine near Sudbury. The mission of the SuperCDMS collaboration is not only to detect dark matter, but also to educate and inspire the public about this scientific endeavour which constitutes perhaps the greatest treasure hunt in history. Prof Diamond is looking for a student to create educational game(s), accessible to the public for free through the collaboration website, incorporating the properties of dark matter as well as the workings of the SuperCDMS detectors. The student will be provided with schematics, including 3D renderings, of the detectors and SNOLAB facility, as well as relevant background information in the field of dark matter.

If you are interested, send an unofficial transcript and 1-paragraph expression of interest by ****Nov 13**** to mdiamond@physics.utoronto.ca. Then, be available to meet with the professor in the subsequent two weeks to jointly develop the details of the research proposal, as outlined below in the call for proposals.

Arthur B. McDonald Canadian Astroparticle Physics Research Institute: Cross-Disciplinary Internship Program

The Arthur B. McDonald Canadian Astroparticle Physics Research Institute (McDonald Institute) strives to grow connections and collaborations with new disciplines to create relationships that communicate and mobilize scientific knowledge.

The Cross-Disciplinary Internship Program (<https://mcdonaldinstitute.ca/cdinternship/>) is designed to enhance student experience by providing an opportunity for continuing full-time or part-time post-secondary students registered in non-physics majors to participate in novel research in astroparticle physics (APP).

This program is open to students across Canada to work with leading APP faculty over the course of the summer term (16 weeks between May and August 2021), alternative terms are available with pre-approval.

This program is intended to provide students with meaningful opportunities to engage in discovery-based learning and to develop research and presentation skills.

For the summer of 2021, there will be a maximum of 6 positions available valued at a maximum of \$12,000 CAN. During this time, students will implement a co-developed research project that draws upon their unique expertise and skills with a host supervisor. Supervisors will provide resources required to complete the research project (e.g. office/lab space, equipment, consumables, etc.). In addition, a contribution of \$500 CAN from the supervisor towards student opportunities (e.g. conference participation, training opportunities, etc.) is required. Students and their supervisors will also have access to the McDonald Institute network and professional development training opportunities. Finally, the intern and the supervisor will be invited to participate at the McDonald Institute's Annual National Meeting in late August 2021.

We seek proposals co-developed by students and a supervising APP faculty member that:

1. Focus on discovery-based learning in astroparticle physics (aligned with the McDonald Institute Research Strategy);
2. Bring new skillsets that are relevant to the astroparticle physics community to enhance the capabilities of a research group/lab;
3. Enhance the student's experience in a cross-disciplinary setting and advance future research endeavours, networking, and interdisciplinary activities;
4. Offer unique training/mentorship opportunities for the student;
5. Include considerations for Equity, Diversity, and Inclusion in the training environment;
6. Encourage the participation of students from equity seeking groups who are traditionally underrepresented and underserved in the physics discipline;
7. Engages cross-disciplinary collaboration from a student studying outside of astroparticle physics (i.e., social sciences such as: anthropology, communication studies, economics, education, geography,

history, Indigenous studies, sociology, or other STEM groups such as: biology, chemistry, environmental science, film and media technology, to name a few);

8. Allows students to pursue new opportunities in previously underdeveloped collaboration areas aimed at advancing scientific knowledge and knowledge mobilization in astroparticle physics;

9. Are realistic in their timeline to completion (4 months, pre-approval is required for alternative timeframes);

Following the completion of their research project, successful applicants are required to provide a photo of themselves engaged in the research group or lab and create materials to showcase the outcomes of their research project and the success of their placement. The McDonald Institute encourages a variety of mediums for knowledge mobilization. For example, a student may submit a short article for non-academic audiences describing their experience, a 3-5 minute video, podcast, photo essay, website, etc. focusing on research outcomes and the value of cross-disciplinary collaborations. Submissions will be used for promotional purposes of the McDonald Institute, the supervisor's lab, and the Cross-Disciplinary Internship Program.

Prospective students must have the following qualifications to apply:

- Enrolled in a full- or part-time post-secondary program outside of physics;
- Eligible to work in Canada;
- Returning to studies after the internship is complete;
- Enthusiasm for discovery-based research and intellectual curiosity;
- A strong record of academic achievement;
- Be open to cross-disciplinary knowledge sharing and learning about astroparticle physics.

Application Process:

Student and faculty members are required to jointly develop a research proposal for submission to the program. Together, the student and faculty member co-fill the application form, which must be submitted by 4pm EDT on Friday November 27, 2020. Students will be required to attach an unofficial transcript.