

# PhD position in Experimental Particle Physics

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The [Pirolab](#) at the University of Alberta invites application for a PhD position in experimental particle physics supported by the McDonald (MI). We are seeking highly motivated and talented graduate students to conduct research and development on new cutting-edge technologies for dark matter searches. The purpose of this position will be to address the most common source of impurity for all rare event searches: the radon and to develop new purification techniques.

This project will involve theory calculations and crucial parameters to be determined from the experimental setup in order to build a universal model for constructing distillation and stripping columns to mitigate radon contamination. The final objective will be to build a column prototype and test it on a scintillating bubble chamber. The research will also include data analysis for experiments searching for dark matter and simulations of the detector expected sensitivity based on Monte Carlo and Geant4 predictions.

Student will have the opportunity to gain hands-on experience in the Pirolab by testing, developing, and assessing different techniques for radon mitigation in dark matter search experiments. Facilities such as [The Shack](#) and Physics machine shop access are available to carry out the research project. It is a unique opportunity for students who want to gain independent thinking, detailed knowledge of both technical aspects of data analysis and of detector design.

Candidates with relevant experimental skills and interest in experience with cryogenic system, high purity gas techniques, data acquisition and data analysis will be given strongest consideration. Experience with detector development and design (SolidWorks, CAD), construction, or operation is desirable and proficiency with computing programming languages (C++, ROOT, Python) and simulation (Geant4, COMSOL) is valuable. Some knowledge in chemistry about gas separation is an asset.

The position will remain open until May 2021.

Applicants of any nationality are welcome and encouraged to apply. Interested applicants are invited to send their transcripts, a brief statement of research interests, a resume and arrange for three letters of reference to be sent to:

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Assistant professor, Department of Physics, McDonald Institute  
University of Alberta, Edmonton.

*Acknowledgement of the land:*

*We respectfully acknowledge that we live, study, and work on Treaty 6 territory, a traditional gathering place for diverse Indigenous peoples including the Cree, Blackfoot, Metis, Nakota Sioux, Iroquois, Dene, Ojibway/Saulteaux/Anishinaabe, Inuit, and many others whose histories, languages, and cultures continue to influence our vibrant community.*