

Master Position at MIRARCO / Laurentian University

Description:

MIRARCO / Laurentian University is looking for a master's candidate to join the team on environmental and radioanalytical geochemistry.

Executive summary / context

Small modular reactors (SMRs) are recognized as a major potential source of electricity for off-grid communities and for mining, particularly in Northern regions. SMR deployment requires a set of baseline data for environmental assessments, including the operational phase and decommissioning. The general objective of the project is to provide the research and/or monitoring capacity to measure radioactive contaminants at environmental levels. Because of the remoteness and the anticipated low levels of contaminants, laboratories equipped with modern instrumentation and trained staff might not be constantly present on location.

Our approach is therefore to develop and test small, rugged samplers designed for challenging conditions, that have a low detection limit for radioactive contaminants, and that can be easily shipped to a modern lab for analysis.

Our objectives are:

- (1) to deploy and test the limit of samplers;
- (2) to replace traditional radioactivity-based technology with modern instrumentation (ICP) and improve the detection limit; and
- (3) to improve the quality assurance of the results.

We propose to test lichens (for airborne contaminants) and other types of samplers for airborne contaminants (passive or active samplers) in the lab and in the field for ruggedness, contaminant uptake and detection limit. The outcome is a series of certified methods that could be used for independent verifications by a regulatory agency.

Tasks of the Intern

Together with a post-doctoral intern and in a team-based environment, the Master's intern will:

- Work on testing and deploying field samplers (passive and active), in the lab and the field;
- Adapt and update digestion/analysis/protocols (conventional by ICP), radiation-based systems (gamma, alpha) or other techniques;
- Develop protocols for testing the limits of samplers, e.g., freeze/thaw or wet/dry cycles, etc.;

Suitable background of the Intern

A candidate from chemical sciences, with a strong background in chemical and analytical techniques. Candidates from a related field (e.g., Forensics, Earth Sciences, Environmental sciences, Biological/biochemical sciences) are also welcome to apply.

Funding

Bruce Power/MIRARCO, Mitacs.

To apply

Candidates should send a short résumé with a cover letter describing the motivations for the project and the team. Please apply to both of us before **September 1st, 2021**.

Dr. François Caron, Emeritus Professor, Laurentian University and Bruce Power Chair for Sustainable Energy Solutions MIRARCO Mining Innovation 935 Ramsey Lake Road Sudbury, ON. P3E 2C6 fcaron@mirarco.org	Dr. Graeme Spiers, Emeritus Professor of Environmental Geoscience Harquail School of Earth Sciences, Laurentian University 935 Ramsey Lake Road Sudbury, ON. P3E 2C6 gspiers@laurentian.ca
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Other

The candidate will have to spend approximately 50% of her/his time at MIRARCO, the Partner, as per Mitacs Accelerate guidelines. Admission to the master's program will be processed through the candidate's institution (Laurentian University or other Canadian university).