



MSc or PhD Position in Environmental Nanogeochemistry

Location: Grenfell Campus, Memorial University of Newfoundland, Corner Brook, Newfoundland and Labrador, Canada

Department: School of Science and the Environment, Boreal Ecosystems and Agricultural Science Program

Research Group: Laboratory for Environmental and Analytical Nanogeochemistry (LEAN)

Duration: 2 years (full-time) for MSc or 4 years (full-time) for PhD

Funding: Fully funded

Anticipated Start Date: May, 2026 or September 2026

Project Description

We are seeking a highly motivated MSc/PhD student to join a multidisciplinary research project aimed at building the foundation for environmental nanogeochemistry. This rapidly emerging field investigates relationships between the properties of systems of natural nanoparticles and colloids, and their effectiveness in environmental roles such as controlling the mobility, bioavailability, and environmental fate of trace elements in natural systems. The research will focus on understanding how natural nanoparticle systems influence processes in soils and aquatic environments, conducted in parallel with an ongoing field study evaluating the application of wood ash as a soil amendment. Potential research directions may include investigating how nanoparticle and colloidal populations in soil solutions change following wood ash and lime applications, and how these nanoscale particles influence nutrient availability and trace element mobility in soils. The project may also include monitoring water quality in nearby surface and groundwater systems to evaluate how ash application affects the transport of nutrients, metals, and nanoparticles in the environment, or how the nature of these nanoparticle systems fluctuates seasonally or following extreme weather events. For example, the research could examine how wood ash application interacts with natural soil colloids and nanoparticles, influencing nutrient cycling, contaminant mobility, and overall environmental quality. The project will involve the use of advanced analytical techniques such as asymmetric flow field-flow fractionation coupled with ICP-MS (AF4-ICPMS) and single-particle ICP time-of-flight mass spectrometry (spICP-TOFMS) to characterize nanoparticles and associated trace elements in environmental samples. This research will generate new knowledge needed to better understand the nanoscale processes that regulate nutrient cycling, contaminant transport, and environmental conditions.

Location and Research Environment

Grenfell Campus is in Corner Brook, Newfoundland and Labrador, on the east coast of Canada, surrounded by the natural beauty of the boreal forest and the North Atlantic coastline. The region provides outstanding opportunities for combining outdoor recreation with field-based environmental research. The campus is located near Gros Morne National Park, a UNESCO World Heritage Site known for its dramatic landscapes, fjords, and geological significance. Students have access to a wide range of outdoor activities including hiking, skiing at Marble Mountain, kayaking, and wildlife viewing. The region is also known for seasonal opportunities to observe whales, seabirds, and icebergs along the coast. Grenfell Campus also has a strong research connection with the Bonne Bay Marine Station, which offers affordable room rentals for students and researchers, making it an ideal location for field-based learning and collaborative research retreats.

Responsibilities

The MSc/PhD student will:

- Conduct laboratory and analytical experiments to investigate nanoparticle–trace element interactions in environmental samples



- Assist with environmental sample collection, preparation, and storage
- Apply advanced analytical techniques such as AF4-ICPMS and spICP-TOFMS for nanoparticle and trace element characterization
- Process and analyze large environmental datasets
- Contribute to the development and optimization of sampling and analytical protocols for nanoparticle analysis
- Present research findings at scientific meetings and prepare manuscripts for publication

Training and Research Environment

The student will be based in the LEAN team, which focuses on developing and using advanced analytical approaches for understanding nanoscale processes in environmental systems. The project provides interdisciplinary training in analytical chemistry, agriculture, environmental geochemistry, and environmental data science. Students will also benefit from collaboration with an international research network specializing in nanogeochemistry and environmental analysis, providing opportunities to work with other researchers in Canada and/or Europe.

Qualifications

Applicants should have:

- A bachelor's degree in chemistry, environmental science, agriculture, earth sciences, or a related discipline if applying for an MSc position, and an MSc degree in one of these areas for the PhD position
- Interest in environmental analytical chemistry, geochemistry, or nanoscience
- Strong analytical and problem-solving skills
- Interest in interdisciplinary environmental research
- For international applicants, eligibility to obtain a Canadian study permit and proof of English language proficiency (e.g., IELTS or equivalent) that meets the admission requirements of Memorial University of Newfoundland

How to Apply

Interested candidates should submit the following documents as a single PDF file:

1. Cover letter describing your motivation, relevant experience, and research interests
2. 1- page proposal for your MSc/PhD research
3. Curriculum vitae (CV)
4. Academic transcripts
5. Contact information for two or three academic references

Please send applications or inquiries to: **Dr. Chad Cuss** (Email: ccuss@mun.ca), and **Salani Fernando** (Email: ksufufernand@mun.ca)

The LEAN Team and Memorial University are committed to employment equity and diversity. While all qualified individuals are encouraged to apply, applications are especially welcome from qualified individuals identifying as members of one or more of the following underrepresented groups: first-generation university students; Indigenous peoples; people with disabilities; people of any sexual orientation, gender identity, or gender expression; visible minorities and racialized people; and women. Applicants are invited to identify themselves as a member of any or several of these designated group(s) in their cover letter as appropriate. This information will be treated as strictly confidential, and will be destroyed after the recruitment process is complete. Applicants from a designated group who choose not to specify the group may instead identify themselves as “a member of a nonspecific designated group”.