



Postdoctoral Associate positions:

Area: Basalt carbonation in Atlantic Canada

Timeframe: 2 years with the possibility of extension, depending on progress and funding

Start date: Fall 2023 (negotiable)

Salary: \$60,000/year plus benefits

Application Deadline: Applications will be evaluated on a rolling basis until the position is filled.

Applications are invited for Postdoctoral Associates to work on coupling a unique, Canadian-made, direct air capture (DAC) technology with accelerated carbon mineralization as a key carbon dioxide removal (CDR) technique under the supervision of Dr. Benjamin Tutolo at the University of Calgary and Dr. Adedapo Awolayo at McMaster University. This project, a joint collaboration between Gaia Refinery Inc., McMaster University, and University of Calgary, is aimed at understanding the processes governing CO₂ mineralization in basalts of Atlantic Canada. Together, this project participants will characterize the rock and in-situ fluid properties to evaluate CO₂ mineralization potential; perform elevated temperature-pressure laboratory experiments to examine the rate of carbon mineralization based on the scheme and scale of injection; utilize numerical models to optimize carbonation rates; and employ and develop data-driven machine learning models to calibrate the modelling efforts and adapt this approach to conduct techno-economic assessment for optimizing site location and cost benefit analysis.

The successful candidate(s) will have the opportunity to work on other active research projects at McMaster University (<https://www.eng.mcmaster.ca/faculty/adedapo-awolayo/>) and the University of Calgary (www.geoscience.ucalgary.ca/reactive-transport/). Successful candidate(s) will have routine access to the [McMaster Research & High-Performance Computing](#), University of Calgary's Advanced Research Computing, and Digital Research Alliance of Canada clusters and hydrogeologic, geochemical, and reactive transport modeling software as well as an extensive suite of experimental and analytical tools for characterizing water-rock-gas interactions.

Candidates should have a PhD in Geoscience, Civil, Environmental, Chemical, or Reservoir Engineering, or a related field. The ideal candidate will have experience characterizing rock mineralogy and/or physical properties or using numerical models to simulate fluid flow and chemical reactions in geologic formations. Knowledge and experience in coding and machine learning are also valuable. The position generally requires excellent communication and interpersonal skills, as well as intellectual independence.

Major Duties/Responsibilities:

- Characterize basalt flow properties and reactivity in the context of carbonate mineralization.
- Experimentally or numerically simulate the fate of injected CO₂ and methods for optimizing carbonation rates.
- Interact with collaborators to optimize injection strategies and cost analysis.
- Present and report research results at conferences, in peer-reviewed journals, and to funding agency in a timely manner
- Maintain a safe, collegial, interactive, and welcoming research environment.

Application details:

Interested applicants should contact please contact Dr. Benjamin Tutolo (benjamin.tutolo@ucalgary.ca) and Dr. Adedapo Awolayo (awolayoa@mcmaster.ca) to apply and/or inquire for more details. **Members of underrepresented groups, particularly women and people of color, are specifically encouraged to apply.**

Attach in **ONE single PDF** document the four documents listed below:

- a CV with a list of publications;
- a 2-page cover letter expressing interest in this position and summarizing previous research experience;
- the contact information of two referees that are familiar your research and academic experience.

The application package should be sent to benjamin.tutolo@ucalgary.ca and awolayoa@mcmaster.ca. The review of applications will begin on June 1, 2023, and continue until the position is filled; however, only those who have been selected for interviews will be contacted further.

About McMaster University:

In keeping with McMaster's institutional vision of fostering the representation of equity-seeking groups at all levels of academic life, we are committed to promoting and maintaining a research ecosystem that fosters inclusive excellence. Recognizing the critical role that diversity plays in harnessing creativity and innovation, as well as the importance of building inclusive and collegial teams within our community.

McMaster is Canada's most research-intensive university and is one of only four Canadian universities ranked among the top 100 in the world by the Times Higher Education World University Rankings for 2022. McMaster has a vision to achieve international distinction (for creativity, innovation, and excellence as a research-intensive, student-centred university) to push our World to a *Brighter World*. McMaster Civil Engineering has a reputation for innovative programs, cutting-edge research, leading faculty, and aspiring students.

About the University of Calgary

The University of Calgary is Canada's leading next-generation university – a living, growing and youthful institution that embraces change and opportunity with a can-do attitude. Located in the nation's most enterprising city, the university is making tremendous progress on its Eyes High journey to be recognized as one of Canada's top five research universities, grounded in innovative learning and teaching and fully integrated with the community it both serves and leads. The University of Calgary inspires and supports discovery, creativity, and innovation across all disciplines. For more information, visit ucalgary.ca.

Additional information

The terms and conditions of employment are covered under the UCalgary and PDAC Collective Agreement. To find out more about postdoctoral scholar program at the University of Calgary visit our Postdocs website.

About Calgary, Alberta

Calgary is one of the world's cleanest cities and has been named one of the world's most livable cities for years. Calgary is a city of leaders – in business, community, philanthropy and volunteerism. Calgarians benefit from the strongest economy in the nation and enjoy more days of sunshine per year than any other major Canadian city. Calgary is less than an hour's drive from the Rocky Mountains and boasts the most extensive urban pathway and bikeway network in North America.

The University of Calgary and our research team recognize that a diverse staff/faculty benefits and enriches the work, learning and research experiences of the entire campus and greater community. We are committed to removing barriers that have been historically encountered by some people in our society. We strive to recruit individuals who will further enhance our diversity and will support their professional success while they are here. We encourage all qualified applicants to apply, however preference may be given to Canadian citizens and permanent residents of Canada.