Doctoral student positions:

> **Area**: interest in geo-energy (CO_2 or hydrogen) storage, critical mineral extraction, radionuclide migration, and geothermal energy production.
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> **Timeframe**: Up to 4 years, depending on progress and funding
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> **Start date**: September 2024 (negotiable)
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> **Salary**: within the range typically offered to graduate students at McMaster University
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> **Application Deadline**: Applications will be evaluated on a rolling basis until the position is filled.

The Department of Civil Engineering (https://www.eng.mcmaster.ca/civil) in McMaster University's Faculty of Engineering invites applications for fully funded Ph.D. positions in any of the above research areas beginning in the Fall of 2024. Our research group focuses on advancing fundamental knowledge of important physicochemical processes in environmental and energy subsurface systems and developing sustainable and applied solutions to challenges encountered at the water-energy-society nexus. Our aim is to couple experimental, theoretical, and numerical approaches to enhance the understanding of the fate and transport of fluids, and their geochemical reactions in subsurface environmental and energy systems.

Successful candidates will engage in a range of activities, including: (a) characterizing rock and *in-situ* fluid properties relevant to specific research area (b) performing elevated temperature-pressure laboratory experiments tailored to the injection scheme and scale (c) utilizing numerical models to capture the associated hydrogeologic and reactive transport processes; and (d) employing and developing data-driven machine learning models to calibrate the modelling efforts. Successful candidate(s) will have routine access to state-of-the-art resources, including the Digital Research Alliance of Canada clusters, hydrogeological and geochemical modeling software, and an array of experimental and analytical tools for characterizing water-rock-gas interactions.

Candidates should have a Bachelor's or Master's degree in Petroleum Engineering, Geosciences, Civil Engineering, Environmental Engineering, Chemical Engineering, Reservoir Engineering, or a related field. The ideal candidate(s) will have experience characterizing rock mineralogy and/or physical properties, or using numerical models to simulate fluid flow and chemical reactions. Mastery of any programming language, including Python, MATLAB, R, C++, or Fortran, is required. Knowledge and experience in data science and machine learning is particularly beneficial. Excellent communication and interpersonal skills are essential, along with intellectual independence and a willingness to explore unfamiliar aspects of the subsurface systems.

Interested applicants should contact awolayoa@mcmaster.ca to apply and/or inquire for more details. Attach in **ONE single PDF** document the four documents listed below:

- a CV with a list of publications;
- unofficial academic transcripts;
- a 1–2-page statement of purpose describing your background and motivation for pursuing a PhD;
- the contact information of two referees that are familiar your research and academic experience.

The application package should be sent to awolayoa@mcmaster.ca. The review of applications will continue until the position is filled; however, only those who have been selected for interviews will be contacted further.

In alignment 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 nurtures an inclusive excellence. Recognizing the critical role that diversity plays in harnessing creativity and innovation, and the importance of building inclusive and collegial teams within our community, the University seeks qualified candidates who share our commitment to equity and inclusion, who will contribute to the diversification of ideas and perspectives, and especially welcomes applications from *indigenous (First Nations, Métis or Inuit) peoples, members of racialized communities, persons with disabilities, women, and persons who identify as 2SLGBTQ+*.

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.