

Doctoral student position:

Area: Radionuclide transport in porous media with chemical and structural heterogeneities

Timeframe: Up to 4 years, depending on progress and funding

Start date: September 2023 (negotiable)

Salary: within the range typically offered to graduate students at McMaster University

Application Deadline: Evaluation of applications will begin on May 1, 2023

The Department of Civil Engineering (<https://www.eng.mcmaster.ca/civil>) in McMaster University's Faculty of Engineering invites applications for a fully funded Ph.D. in radionuclide migration and nuclear waste disposal beginning in the fall of 2023. The successful candidate will work under the supervision of Drs. **Robin Zhao** and **Adedapo Awolayo** to systematically characterize geological repositories and permafrost for the deployment of SMR in rural and Northern Canada, employ a reactive transport modelling approach to assess radionuclide transport behaviour, and adapt this approach to the evaluation of other prospective sites across Canada. The primary focus will be on modelling the associated hydrogeologic and reactive transport processes, with additional effort going toward developing data-driven machine learning models to calibrate the modelling efforts and screen the suitability of various regional formations across Canada as potential SMR hosts and waste disposal sites, depending on the precise SMR design specifications.

Candidates should have a Bachelor's or Master's degree in Civil Engineering, Environmental Engineering, Chemical Engineering, Reservoir Engineering, Petroleum Engineering, Geosciences, Chemistry, Physics, or a related field. Experience with water-rock interaction or a background or interest in geochemistry will be considered advantageous. Mastery of any programming language, including Python, MATLAB, R, C++, or Fortran, is required, but Python is preferred. Knowledge and experience in data science and machine learning are especially advantageous. The position generally requires excellent communication and interpersonal skills, as well as intellectual independence.

Interested applicants should contact robinzhao@mcmaster.ca and 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 robinzhao@mcmaster.ca and awolayoa@mcmaster.ca. The review of applications will begin on May 1, 2023, and continue until the position is filled; however, only those who have been selected for interviews will be contacted further.

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, ***applicants from all visible minorities are strongly encouraged to apply.***

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.