

Department of Civil Engineering JHE-301 1280 Main Street West Hamilton, ON L8S 4L8 (905) 525-9140 x 24172
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Postdoctoral Associate – TRISO Nuclear Fuel Repository Source Term Modeling

Location: McMaster University, Department of Civil Engineering Start Date: Negotiable (Fall 2025 preferred) Duration: 1 year Application Deadline: Open until filled

We are seeking a motivated Postdoctoral Associate to join a government-funded project focused on modeling radionuclide transport from advanced nuclear spent fuels—with particular emphasis on TRISO fuel performance in deep geological repositories. This collaborative project involves leading Canadian institutions including Western University, Ontario Tech, York University, and Canadian Nuclear Laboratories, and supports Canada's efforts toward Small Modular Reactors (SMRs) and long-term nuclear waste management.

Key Responsibilities

- Develop and validate source term models for spent nuclear fuel under repository conditions
- Simulate radionuclide release and transport using tools such as PFLOTRAN, ORIGEN, OpenFOAM, or custom numerical models
- Conduct molecular dynamics simulations (e.g., with LAMMPS, GROMACS) and/or pore-scale flow and transport modeling (e.g., Lattice Boltzmann, OpenFOAM)
- Collaborate on technical reports, peer-reviewed publications, and stakeholder deliverables

Desired Qualifications

- PhD in civil/environmental engineering, nuclear engineering, mechanical engineering, physics, materials science, or a related discipline
- Strong background in computational modeling of transport phenomena
- Experience with any of the following is an asset:
 - Nuclear fuel performance modeling or source term assessment
 - Geochemical or radionuclide transport modeling
 - Programming skills in Python, MATLAB, or C++
 - o Machine learning techniques for scientific modeling

This position offers the opportunity to contribute to the science underpinning Canada's future energy and environmental safety landscape, while working in a highly interdisciplinary and collaborative research environment.

To Apply

Please send the following as a single PDF to robinzhao@mcmaster.ca:

- CV with a list of publications
- Unofficial academic transcripts
- 1–2-page statement of purpose
- Contact information for two academic referees

The review of applications will begin on May 15, 2025, 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



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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-centered 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.