



Memorial University of Newfoundland

Department of Process Engineering

230 Elizabeth Avenue

St. John's, NL, Canada A1C 5S7

www.mun.ca/engineering/process/

<https://www.mun.ca/engineering/research/eor/>



PhD Opportunity for May 2025

scCO₂-Brine Drainage and Imbibition Capillary Pressure Measurements at Storage Conditions

The Hibernia Research Group, in the Department of Process Engineering, Memorial University of Newfoundland is seeking a strong PhD candidate for research related to geological carbon storage beginning May 2025. The position is in person at Memorial University, St. John's, NL, Canada.

Project Description

Objective: Develop methodologies to measure drainage and imbibition capillary pressure (P_c) of scCO₂/brine systems under in-situ high-pressure, high-temperature conditions that would be similar to reservoir conditions.

Activities:

- Develop methodology, best practices and capability to measure drainage P_c of scCO₂/brine system at in-situ high pressure, high temperature (HPHT) storage conditions as well as at laboratory conditions with model fluids;
- Compare drainage P_c measurements of scCO₂/brine system at in-situ HPHT storage conditions with drainage P_c measurements with model fluids at lab conditions;
- Compare scCO₂-brine drainage capillary pressure vs. mercury intrusion capillary pressure and test the literature correlation developed based on incorporation of IFT/contact angle;
- Identify changes to wettability due to elevated temperature/pressure condition as well as mineral dissolution/re-precipitation for a non-equilibrated fluid system;
- Develop methodology/capability to measure imbibition P_c of scCO₂/brine system at in-situ HPHT storage conditions.

Applications should be sent as a single pdf file containing Curriculum Vitae including publication list, a statement of interest, copies of degrees certificates and transcripts, English language proficiency certificate (if applicable), a copy of thesis/publications (may send a list to a link of downloadable

documents), and names and contact information of three referees to: hiberniaadmin@mun.ca and nhyndman@mun.ca.

For more information about the Hibernia Research Group, please visit <https://www.mun.ca/engineering/research/eor/>

Information on Memorial University tuition fees can be found at the following link <https://www.mun.ca/become/graduate/tuition-fees-and-funding/>.

The PhD stipend will be \$40,000/year for four years. Additional support (SGS fellowship, graduate assistantship) may also be available.

Deadline to receive applications is December 6, 2024. Maximum attachment file size is 8 MB. If larger, please send a link.

Required Selection Criteria

You must possess a professionally relevant background (BSc and MSc) in Engineering (Petroleum, Chemical, Geological) or Science (Geochemistry, Geology, Chemistry, Surface Chemistry) with specialty in experimental or modelling and simulation approaches. Exceptional other backgrounds will be considered.

You must be able to travel to the USA.

For candidates with degrees from schools where English is not the primary teaching/research language, a recent English language proficiency certificate with strong scores in writing and speaking modules is necessary.

All the degrees certificates and transcripts should be in English language.

You must meet the admission requirements set forward by the School of Graduate Studies, Memorial University of Newfoundland: <https://www.mun.ca/become/graduate/>

Preferred Selection Criteria

We are seeking qualified candidates with relevant background in engineering and science, and strong knowledge in fundamentals and applications.

Industry experience is an asset.

We are particularly interested in interviewing candidates with working experience and knowledge in chemistry of minerals, high-pressure high-temperature lab environment, and capable of operating rock and fluid characterization equipment (coreflooding, IFT/wettability, porosimetry and permeametry with He and Hg, capillary centrifuge, PVT, SEM-MLA, rheometer, XRD, XRF, and AFM, among other equipment).

Familiarity with engineering software applications, simulation packages and programming language(s) is an asset (OPM, OpenFOAM, pore scale modelling, Python, MATLAB, ChemStation, ECLIPSE, PETREL, CMG, COMSOL Multiphysics, OLG Dynamic Multiphase Flow Simulator, among other software packages).

Personal Characteristics

- Ability to work independently as well as in teams

- Good communication/networking skills and strong writing capabilities
- Motivated and able to engage in theoretical and practical research and interdisciplinary collaboration

Equity, Diversity and Inclusion (EDI) Statement

Memorial University is committed to employment equity, diversity, inclusion and anti-racism, and encourages applications from all qualified candidates, including: women; people of any sexual orientation, gender identity, or gender expression; Indigenous Peoples; visible minorities, and racialized people; and people with disabilities. Memorial is committed to providing an inclusive learning and work environment. If there is anything we can do to ensure your full participation during the application process, please contact equity@mun.ca directly and we will work with you to make appropriate arrangements.

About the Faculty of Engineering and Applied Science

The Faculty of Engineering and Applied Science offers accredited undergraduate programs in civil engineering, computer engineering, electrical engineering, mechanical engineering, ocean and naval architectural engineering and process engineering, following a fully integrated co-operative education model. At the graduate level, the department of process engineering offers thesis-based master's and doctoral programs in oil and gas engineering, and process engineering, as well as course-based master's programs in oil and gas engineering and safety and risk engineering. For more information, please visit <https://www.mun.ca/engineering/>.

About Memorial

Perched on Canada's North Atlantic coast, Memorial University of Newfoundland is a destination for discovery. A beacon for the 21st-century explorer, Newfoundland and Labrador's university is a unique learning community founded in 1925 as a living memorial to those who lost their lives in the First World War – "that in freedom of learning their cause and sacrifice might not be forgotten." Today more than 18,000 students from nearly 110 countries come together to discover. From the classics to advanced technology, the comprehensive university offers certificate, diploma, undergraduate, graduate and postgraduate programs across five campuses, numerous locations and online. A global network of almost 95,000 accomplished alumni throughout the world strengthens Memorial University's capacity and reputation for leadership in world-class research, teaching and public engagement. To take a closer look, visit www.mun.ca.

Land Acknowledgement

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.