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The Department of Geological Sciences and Geological Engineering at Queen's University invites applications for **three (3) Postdoctoral Fellowships** to support the Department's research mission. The appointments are anticipated to begin in the Fall 2027 semester, with the possibility of an earlier start date as early as May 2027. This posting is for a new position within the University and will contribute to the research program of the Eddie Goldenberg Research Chairs of Canada Program in Slope Geohazard Management for Infrastructure and Mining in a Changing Climate, to be established by Queen's University under the direction of incoming Chairholder Dr. Gabriel Walton.

Slope Geohazard Management for Infrastructure and Mining in a Changing Climate

As a result of climate change, Canada must anticipate and prepare for an increase in both the frequency and severity of slope geohazards, such as landslides, rockfalls, and debris flows. Each year, slope failures across Canada cause direct and indirect losses that total in the hundreds of millions of dollars, with disproportionate impacts on rural, northern, and Indigenous communities. These hazards are increasingly threatening critical infrastructure, resource development, and the property and safety of Canadians, with devastating functional and financial consequences. Climate change is expected to amplify the severity and socioeconomic impact of these hazards due to increased permafrost thaw, extreme precipitation events, and wildfires. To address this growing challenge and mitigate the negative impacts of slope geohazards, innovative solutions will be co-created in partnership with civil infrastructure owners, engineering design experts, mine operators, and local communities to improve geohazard characterization, forecasting, and data-informed risk mitigation.

The Research Chair will establish Canada as a global leader in slope geohazards and foster collaboration with partners internationally, while training the next generation of engineers and geoscientists in hazard management and infrastructure design for climate resilience. The research program will contribute tangible economic and societal benefits to Canada, including: (1) helping to ensure the continued functionality of critical infrastructure relied upon across Canada through the development of new tools for improved hazard identification and management; (2) contributing to Canada's Arctic sovereignty through community-scale hazard studies to support safer infrastructure development and risk-informed planning in northern regions; (3) supporting policymakers in prioritizing investments and strengthening infrastructure resilience under future climate conditions through the development of climate-informed hazard projections; and (4) supporting Canada's critical minerals supply chain and the transition to clean technologies through an improved understanding of slope behaviour to inform engineering design practices that enhance mine safety and efficiency.

Description of the Role

This represents a unique opportunity to participate in engineering research with real-world impact while receiving exceptional training and mentorship. As one of the first members of the Chair's group at Queen's, your contributions will be critical to setting the foundation for the program's culture and future endeavours.

The Research Chair program will be conducted in close partnership with a variety of industry and community stakeholders, giving team members a chance to interact with and learn from potential future employers and collaborators during their research. Dr. Walton's mentees have a strong track record of job placement.

Applicants must obtain clearance to graduate from their Ph.D. program before starting their postdoctoral fellowship.

Postdoctoral Fellows appointed to these positions are expected to reside in Kingston, to be actively involved in the day-to-day life of the Department of Geological Sciences and Geological Engineering, and to collaborate in developing research ideas with faculty and students in the Department.

The annual salary for this appointment is expected to be between **\$51,475 - \$75,000**. Actual Salary will be determined based on qualifications and experience. Actual Salary will be determined based on qualifications and experience.

Qualifications:

A Ph.D. and research or professional experience relevant to geological engineering and/or slope hazards problems are required.

Primary responsibilities will include development, execution, and publication of independent research under the guidance of the Chair. Technical expertise in an area related to the project of interest is required. Mentorship and support of student researchers will represent part of the role, so a willingness to serve as a mentor is required; prior mentorship or teaching experience is considered an asset but not required. Candidates should be self-motivated and have a track record of conducting practically relevant research.

The University invites applications from all qualified individuals. Queen's is strongly committed to employment equity, diversity, and inclusion in the workplace and encourages applications from Black, racialized/visible minority and Indigenous people, women, persons with disabilities, and 2SLGBTQ+ persons. All qualified candidates are encouraged to apply; however, in accordance with Canadian immigration requirements, Canadian citizens and permanent residents of Canada will be given priority.

How to Apply:

To comply with federal laws, the University is obliged to gather statistical information as to how many applicants for each job vacancy are Canadian citizens / permanent residents of Canada. Applicants need not identify their country of origin or citizenship; however, all applications must

include one of the following statements: “I am a Canadian citizen / permanent resident of Canada”; OR, “I am not a Canadian citizen / permanent resident of Canada”. Applications that do not include this information will be deemed incomplete.

A complete application consists of:

- a cover letter (including one of the two statements regarding Canadian citizenship/permanent resident status specified in the previous paragraph);
- a current Curriculum Vitae (including a list of published and unpublished works);
- 1-page statement of current and prospective research interests (including an indication of potential projects of interest from the **list below**);
- a statement of teaching interests and experience (including evaluations if available); and
- the names of three referees, who will send letters of reference separately.

Further information about the Department of Geological Sciences and Geological Engineering may be found at <https://www.queensu.ca/geol/>

The University has policies in place to support its employees with disabilities, including an Accommodation in the Workplace Policy and a policy on the provision of job accommodations that take into account an employee's accessibility needs due to disability. The University will provide support in its recruitment processes to applicants with disabilities, including accommodation that takes into account an applicant's accessibility needs. If you require accommodation during the interview process, please contact the Department of Geological Sciences and Geological Engineering (Sara Bernard; bernards@queensu.ca)

Please submit applications to g.walton@queensu.ca. Applications will be reviewed commencing **November 15, 2026**.

As part of the application process at Queen’s University, our recruitment process uses Artificial Intelligence (AI), as defined under the Ontario Employment Standards Act, to ask job-related questions and assess suitability for hire. All final hiring decisions are made using non-AI related processes.

Example Projects:

Advancing THM Modeling Approaches for Fractured Permafrost Rockmasses (co-supervisor – Dr. Mehdi Pouragha, Carleton University): Existing thermo-hydro-mechanical (THM) models typically capture only a subset of the complex feedbacks among heat transport, groundwater flow, fracture evolution, and rock deformation that govern the long-term behaviour of rockmasses experiencing permafrost degradation. As the postdoctoral researcher assigned to this project, you will lead the development and application of advanced numerical models to investigate the coupled processes governing permafrost degradation, fracture evolution, groundwater flow, and slope deformation, while collaborating closely with graduate students and project partners to integrate field observations with process-based simulations. This position offers an opportunity to make fundamental advances in coupled-process mechanics while contributing to improved understanding and management of climate-driven geohazards in cold regions.

Development of a Canada-Wide Photographic Slope Monitoring Network: The Research Chair will establish an ambitious nationwide network of monitoring sites using photographic, fixed photogrammetric, and periodic lidar monitoring. As the postdoctoral researcher assigned to this project, you will work with the Chair's team and external partners to select sites for monitoring, design site-specific monitoring plans, set up initial monitoring sites, and perform research related to the processing and use of the derived data. This position will serve as a foundation for long-term collaborative research based on the data collected by the monitoring network.

Development of Approaches for Incipient Rockfall Detection Using Remote Sensing: While overall geohazard risk can be assessed at the individual site/asset scale, corridor scale, or network scale, individual hazard event occurrences tend to be somewhat "random" in nature. What this means is that responses to individual hazard events occur on an emergency or urgent need basis, with no ability to proactively identify and prioritize mitigation measures based on real-time data. As the postdoctoral researcher assigned to this project, you will develop approaches to use remote sensing data (e.g. point clouds) to detect regions of incipient slope instability and forecast rockfall occurrence.

Evaluation of Electromagnetic Methods for Permafrost Mapping and Assessment: Future changes in permafrost in northern Canada will have substantial implications for geotechnical stability of infrastructure, yet characterization of permafrost at scale remains challenging. Drone-based geophysics represents a novel method to track changes in permafrost over time across large areas. Through a partnership with Pioneer Exploration (Ottawa, Canada), the postdoctoral research assigned to this project will evaluate the potential of a new time-domain electromagnetic system for permafrost mapping through multi-season tracking of changes in electrical conductivity within the subsurface.