

Graduate Positions Available



The Department of **Geological Sciences and Geological Engineering (GSGE)** at Queen's University is looking for a number of PhD and MSc students for fully funded studentships starting September 2020. Qualified students are encouraged to send an expression of interest to the respective prospective advisors listed below, and to visit our Graduate Studies Information Page. **Applications are due by March 1, 2021.**

The GSGE Department at Queen's University is committed to building **diverse and inclusive** research groups, and students from historically underrepresented groups in Science, Technology, Engineering and Mathematics (STEM) and non-traditional backgrounds are highly encouraged to apply. Students will be supported in pursuing endeavors and engaging in **science outreach** aimed at increasing diversity and visibility of underrepresented groups in STEM fields.

Geodynamics/Geoselenic Research- Dr. Alexander Braun

PhD position available. The research program targets the Himalaya, and examines links between pre-orogenic structures and the overriding orogen over the course of the mountain-building cycle, from early crustal thickening to present-day seismicity

- i) Numerical modelling of fault reactivation in continental interiors and proximal to orogenic fronts: Testing the potential role of Indian basement structures in controlling seismicity along the Himalayan front.
- ii) Tectonic geomorphology of deformed or offset fluvial landforms and deposits, combined with low temperature thermochronology (optically stimulated luminescence, fission track, (U-Th)/He) in intraplate India: Assessing the reactivation history and seismic potential of Indian basement faults.
- iii) Along-strike structural variability of the frontal Sub-Himalayan thrust belt in NW Nepal: Assessing the reactivation history of cross-strike transfer.

Drone Geophysics - Dr. Alexander Braun

PhD position available. This position is funded as part of the NSERC Create program "UTILI: Uninhabited aircraft systems Training, Innovation and Leadership Initiative" - <https://carleton.ca/utili/>

The student will conduct research on using drones to acquire, optimize, or innovate geophysical data acquisition and exploration. Applicants should have a MSc degree or equivalent in geophysics, geomatics engineering, physics, or electrical engineering and demonstrate an interest in unmanned aerial systems. Please also consult the admission requirements for the UTILI program and submit your application package to Prof. Alexander Braun - geoselenic@queensu.ca

Geodesy/Geomatics Engineering - Dr. Georgia Fotopoulos

PhD position available. Students who hold a Master's degree (or equivalent) in Geomatics Engineering, Surveying Engineering or Geodesy are welcome to apply for this fully funded four year position. The successful applicant will join the Geophysics and Geodesy lab. Applicants with strong programming, data processing and scientific visualization skills will be preferred. Please email your application package to Prof. G. Fotopoulos – gf26@queensu.ca

Digital Earth Science/Computational Geophysics - Dr. Hom Nath Gharti

- i) Integrated monitoring and modelling of tailings dams:

A recent devastating failure of the tailings dam in Brazil has shown the importance of the stability analysis and monitoring of tailing dams in Canada. We plan to deploy high-precision geophones and design near-real-time monitoring of microearthquakes caused by potential instabilities. Additionally, we want to integrate stability modelling based on an accurate and efficient numerical analysis method. Such an integrated system can be a valuable tool to ensure the safety of these massive structures.

- ii) Modelling and inversion of gravity perturbation:

Every earthquake perturbs the Earth's gravitational field. Although such gravity perturbations are small, these are frequently measured by, for example, GRACE satellite and network of superconducting gravimeters. We have recently developed an accurate and efficient numerical method to model these perturbations. We plan to apply this new numerical method to model and invert these gravity perturbation data, potentially integrating them with the seismic data.

Continental Tectonics - Dr. Laurent Godin

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Environmental Mobility of Critical Metals – Dr. Heather Jamieson

Critical metals (Co, Li, W, REEs) are those of high economic importance, especially for green energy, but with a risk of supply chain interruption. Multiple projects are available to study the environmental impact of mining or recycling these metals.