

The Department of Geological Sciences and Geological Engineering (GSGE) at Queen's University is looking for a PhD student for fully funded studentships starting in the 2023 academic year with plans of fieldwork in the summer of 2023. Qualified students are encouraged to contact Dr. Chris Spencer (c.spencer@queensu.ca) and visit our [Graduate Studies Information Page](#).



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 endeavours and engaging in science outreach aimed at increasing the diversity and visibility of underrepresented groups in STEM fields.

### **Project: Testing the migmatite-to-granite connection in a transpressional orogen**

The origin and evolution of continental crust is an enduring controversy in geology. There is a broad consensus that the processes responsible for the generation of granitic magma are intimately connected to how continental crust is generated. However, the spatial and temporal evolution of the crustal-scale plumbing systems that might explain how magma congregates and ascends through the crust to form major granite plutons is also controversial. In Brittany, NW France, large plutonic bodies, which include a volumetrically minor mafic component, are well exposed at different crustal levels, and range from migmatite to granite in composition. Previous work has broadly constrained their (Neoproterozoic) age and tectonic setting (emplacement during regional transpression along the Gondwanan margin) but has yielded contrasting interpretations concerning their petrogenesis and crustal level of emplacement, hindering a robust reconstruction of the crustal plumbing system.

To reconstruct the crustal-scale plumbing system, the PhD candidate will map and select strategic samples for laboratory analysis to investigate (i) the age (including those of antecrysts, autocrysts, and xenocrysts) of its felsic and mafic components using U-Pb isotopic geochronology, (ii) geochemistry, including major, trace and rare earth elements, (iii) the source rocks, using Lu-Hf and O isotopes on zircon and other accessory mineral phases, (iv) the depth of emplacement of the various granitoid bodies and (v) the relationship between magma ascent and adjacent shear zones. Using these data, the candidate will determine the petrogenesis of the migmatites and granite plutons in the context of regional orogenesis and Gondwanan geology.

The student will be co-supervised by Chris Spencer (Queen's), Brendan Murphy (StFX), Rob Strachan (U. Portsmouth), and Craig Storey (U. Portsmouth).

Any student interested in this project should send a statement of purpose, CV, and unofficial transcripts to Dr. Spencer (c.spencer@queensu.ca) before completing the application process.