



THE UNIVERSITY OF BRITISH COLUMBIA

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MASTERS RESEARCH OPPORTUNITY

Start date: Sept. 2025 or Jan. 2026

Supervisors: Julie Prytulak and Shaun Barker

A novel combined lead-thallium isotopic approach to detect deep porphyry copper deposits

The department of Earth, Ocean and Atmospheric Sciences at the University of British Columbia (<https://www.eoas.ubc.ca/>) invites applications for a two-year Masters (MSc) position funded by the Targeted Geoscience Initiative (Government of Canada). The objective is to develop, test and refine a novel combined Pb-Tl isotopic vectoring technique for buried copper porphyry systems.

Premise: Hydrothermal fluids are essential to the formation of copper porphyry deposits. The extent of hydrothermal circulation during porphyry formation and its chemical fingerprint can be an effective vector towards undiscovered deposits – particularly for deeper, buried systems. The elements lead (Pb) and thallium (Tl) are neighbours on the periodic table and have similar elemental behaviour, including efficient mobilisation in hydrothermal fluids. However, stable thallium and radiogenic lead isotopic compositions will have different responses to hydrothermal processes and styles of alteration. **Objective:** This project uses the Pb-Tl isotopic compositions of well-characterised samples encompassing the breadth of porphyry hydrothermal alteration to assess if combined Pb-Tl isotopes can vector towards buried deposits, and/or provide a measure of their fertility.

Methods and Training: The student will 1) conduct textural, mineralogical, and geochemical characterisation of porphyry samples to assess which mineral phases host Pb and Tl, 2) analyse trace elements and Pb-Tl isotopic compositions of selected samples, and 3) build a framework for understanding Pb-Tl behaviour during hydrothermal circulation that is applicable to both barren and fertile systems. Requirements include a strong interest in isotope geochemistry, mineralogy and economic geology. The student will be supervised by Julie Prytulak and Shaun Barker and be embedded in both the Pacific Center for Isotope and Geochemistry research (PCIGR) and the Mineral Deposit Research Unit (MDRU) at UBC and receive training in geochemical techniques, data interpretation, and ore body knowledge.

Application and Eligibility: The position is open to domestic and international applicants (provided they are legally able to study in Canada at the time of appointment). Interested candidates should first contact Julie Prytulak (jprytulak@eoas.ubc.ca) with a cv, short explanation of their interest, and their suitability for the position. Formal applications are made through UBC's graduate school.

The Department of Earth, Ocean and Atmospheric Sciences is one of the most academically-diverse and productive of its kind in Canada, encompassing a wide range of disciplines from geochemistry, geology and geological engineering to oceanography and atmospheric science. UBC consistently ranks among the top 10-15 universities globally in the field of Earth and marine sciences.