THE UNIVERSITY OF BRITISH COLUMBIA

Department of Earth, Ocean and Atmospheric Sciences
Faculty of Science
2020–2207 Main Mall
Vancouver, BC, Canada V6T 1Z4

PHD POSITION

Listening to metal messengers in magnetite

Start: September 2027 | **Funding:** Fully funded, 4 years | **Apply by:** December 21, 2026

THE PROJECT

Magnetite is ubiquitous in igneous, hydrothermal and ore-forming systems. The onset of magnetite crystallisation may trigger sulfide saturation in arc magmas (the 'magnetite crisis'), and the origins of magnetite layers in mafic–ultramafic intrusions remain debated. Magnetite is also a major source of iron (Fe) and vanadium (V), whose stable isotopes may record magmatic sources and differentiation (Stow et al., 2021, 2024) and experiments show that magnetite–melt V isotope fractionation varies systematically with oxygen fugacity (Sossi et al., 2018). However, Fe and V isotopes have rarely been measured on the same minerals, or at a resolution to link isotopic composition to textures. To do so requires new analytical approaches.

This project will build a coupled Fe–V isotope dataset for magnetite from contrasting tectonic settings: all first texturally characterised and analysed for trace elements by LA-ICP-MS. It will determine if 1) magnetite locks in a distinctive Fe-V isotopic signature, 2) whether Fe–V isotope are driven by kinetic processes and 3) if Fe-V isotopes can disentangle physical parameters crystallisation.

AIMS

- Develop and cross-calibrate Fe-V isotope methods for single crystals (CRC-MC-ICP-MS, MC-MICAP-MS)
- Produce the first coupled Fe–V isotope dataset for magmatic, hydrothermal and ore-related magnetite
- Test Fe–V isotopes as tracers of redox, magma evolution and fluids in fertile vs barren ore systems

SUPERVISION AND TRAINING

The student will be supervised by Prof. Julie Prytulak and will carry out macroscopic sample characterisation in collaboration with UBC's Mineral Deposit Research Unit (MDRU) and receive hands-on training at the Pacific Centre for Isotopic and Geochemical Research (PCIGR) in clean laboratory chemistry, LA-ICP-MS and CRC-MC-ICP-MS. The project is collaborative with Prof. Michael Wieser and Dr. Anika Retzmann at the University of Calgary to develop MC-MICAP-MS approaches.

QUALIFICATIONS

- A master's degree in Earth sciences, geochemistry, chemistry or a related discipline
- Previous experience in clean laboratory work (e.g., sample digestion, column chemistry) and/or isotope geochemistry (e.g., ICP-MS or MC-ICP-MS analysis) is considered an asset
- A strong interest in analytical method development, and good written and oral communication skills

HOW TO APPLY

Email your CV and a one-page statement on your fit to the project, including motivation for doing a PhD, to **jprytulak@eoas.ubc.ca** with the subject line "PhD Application: Magnetite".

Deadline: December 21, 2026. Applications are reviewed as they arrive. Shortlisted candidates will be interviewed online. The successful candidate must then apply formally to UBC, with complete references, by January 15, 2027 (eoas.ubc.ca/grads/apply).

EQUITY, DIVERSITY AND INCLUSION

Equity and diversity are essential to academic excellence. An open and diverse community fosters the inclusion of voices that have been underrepresented or discouraged. We encourage applications from members of groups that have been marginalized on any grounds enumerated under the B.C. Human Rights Code, including sex, sexual orientation, gender identity or expression, racialization, disability, political belief, religion, marital or family status, age, and/or status as a First Nation, Métis, Inuit, or Indigenous person. UBC's Vancouver campus is located on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam) people.