

MSc Project: Petrogenesis of the UG2 chromitite, Bushveld Complex (South Africa)

The Newmont Chair in economic geology at the University of Ottawa is sponsoring an MSc project. The ~1 m thick UG2 chromitite of the ~2 Ga Bushveld Complex is one of the largest platinum-group metal deposits in the world. However, the mechanism(s) by which it crystallised and accumulated remain(s) controversial, and several distinct models for this exist in the literature. These models span a range of magma chamber processes, including in situ crystallisation, crystal settling and emplacement of crystal slurries. This project will investigate the origin of the UG2 chromitite via a detailed mineralogical, microstructural and geochemical study of a continuous core section through the ore body, sampled from the western lobe of the Bushveld Complex. Specific techniques to be applied include separation and analyses of platinum-group minerals in the chromitite, and the construction of an Os isotope stratigraphy through the thickness of the unit. The main project goal is to resolve whether the chromitite was formed as a product of one crystallisation event, or if it preserves evidence for incremental assembly. It is anticipated that the data produced in this project will provide valuable new insights into magmatic ore deposit formation, as well as processes operating in open system magma chambers more generally.

This project will suit students with strong interests in magmatic petrology, mineralogy and radiogenic isotope geochemistry. Please direct requests for more information and/or formally express interest by contacting Professor Brian O'Driscoll at bodrisco@uottawa.ca. The project will be based at the Department of Earth and Environmental Sciences at the University of Ottawa (<https://www2.uottawa.ca/faculty-science/earth-environmental-sciences>). This project is fully funded and has a start date of September 2022 or January 2023. Formal expressions of interest should be accompanied by a current CV, an (unofficial) academic transcript, and the contact details of two referees.