
Modular Course

Exploration for Magmatic Ore Deposits

19 – 28 April 2022

Mineral Exploration Research Centre
Harquail School of Earth Sciences
Goodman School of Mines
Laurentian University

Course Description: 10-day intensive course in magmatic **Ni-Cu-(PGE), PGE, Cr, and Ti-V** deposits including 3 days of theoretical material, 5 days of case studies, and 2 days of exploration methods. Topics include: S and Cr solubility and metal partitioning in mafic-ultramafic magmas; generation of fertile magmas; applications of stable and radiogenic isotopes (including mass-independent S isotopes) in identifying S and metal sources; sulfide transport and localization mechanisms; textures and deformation of Fe-Ni-Cu sulfide ores, sulfide recalculation and plotting methods; geology/genesis of and exploration for Ni-Cu-(PGE) deposits in mafic-ultramafic lava channels, feeder sills/dikes, and magma conduits; geology/genesis of and exploration for PGE deposits in mafic-ultramafic layered intrusions; geology/genesis of and exploration for stratiform and podiform Cr deposits and Ti-V deposits in anorthosites and mafic-ultramafic intrusions. Case studies and laboratory exercises will include: Alexo (ON), Duluth (MN), Eagle (MI), Eagle's Nest (ON), Kambalda (WA), Jinchuan and other deposits in China, Noril'sk-Talnakh and Pechenga (RU), Tamarack (MN), Thompson (MB), Raglan (Nunavik), Sudbury (ON), and Voisey's Bay (Labrador) Ni-Cu-PGE; and Bushveld (SA) and Stillwater (MT) PGE and Cr; and 'Ring of Fire' (ON) Cr. Exploration methods include geological/mineralogical/lithochemical/geophysical applications to greenfields/regional/brownfields targeting.

Confirmed Speakers: **Dr Steven Barnes** (CSIRO), **Dr Sarah Dare** (UQAC), **Dr Pedro Jugo** (HES/MERC), **Dr Michel Houlé** (GSC/HES), **Alan King** (Geoscience North), **Prof Michael Lesher** (HES/MERC), **Dr Eduardo Mansur** (NGU), **Dr Louise Schoneveld** (CSIRO)

Prerequisites: Advanced undergraduate-level courses in *Geochemistry, Igneous Petrology, and Ore Deposits*.

Course Format: lectures (theory, applications, and case studies) and laboratory exercises (combination of spreadsheet calculations and modelling, and hands-on sample examination and interpretation)

Delivery Mode: on-campus (COVID-permitting) and live remote (via Zoom)

Course Credit: 3 credits, applicable toward thesis-based or coursework-based MSc and PhD programs; applicable toward continuing education and professional development requirements for Professional Registration.

Grading: Laboratory practicals and problem sets 100%.

Registration: please contact Mme Roxane Mehes rmehes@laurentian.ca

Updated versions of the course Syllabus (this document), Registration Form, Schedule, and Logistical Information will be posted at <http://hes.laurentian.ca/modular-courses>. For other information about this particular course please contact mlesher@laurentian.ca.