



## **Metal Earth Graduate Student Research Opportunities, May 2021**

With CAD \$104 million in funding provided by the Canada First Research Excellence Fund (CFREF), the Northern Ontario Heritage Fund and through strategic partnerships with universities, government geological surveys and international research centres, Laurentian University has initiated Metal Earth - the largest ever mineral exploration research project undertaken in Canada. Metal Earth seeks to identify and understand the processes responsible for Earth's differential metal endowment during the Precambrian. This research initiative aims to transform our understanding of Earth's early evolution and how we explore for metals.

Metal Earth is led by the Mineral Exploration Research Centre (MERC) at Laurentian University in Sudbury, Canada. MERC was established in 1997 and comprises an internationally recognized group of researchers from academia, industry and government.

### **Metal Earth Postdoctoral Fellowship**

#### **PDF Project 1 (2021 01): Westward extension of Larder Lake Cadillac Deformation Zone (LLCDZ) and the Porcupine Destor Deformation Zone (PDDZ) across the Kapuskasing uplift**

The goal of the project is to determine the expression and the extent of major crustal breaks across different rock types and metamorphic facies, and to identify processes controlling the distribution of orogenic gold systems at the subprovince scale. These goals will be achieved through: (1) GIS compilation and airborne magnetic data interpretation, (2) Structural kinematic analysis, (3) Geochemistry and geochronology of intrusions/sedimentary successions, (5) Petrography of hydrothermal alteration and mineralization. The project is one of two complementary studies that will trace the extent of the LLCDZ and PDDZ west across the Swayze greenstone belt and Kapuskasing uplift into the Wawa terrane. The project will focus on the LLCDZ, characterize its deformation history and that of associated sedimentary basins, and provide the required knowledge base for correlation with the well-studied LLCDZ and PDDZ of the Abitibi greenstone belt.

The position is funded for two years beginning in April or May 2021. The project will be supervised by Drs. Bruno Lafrance and Stéphane Perrouty at Laurentian University. Top applicants will have mapping experience in greenstone belts, structural geology, orogenic gold deposits, and geochronology. Salary range is \$65-\$80k/yr plus benefits.

### **Metal Earth PhD and MSc Graduate Opportunities**

Metal Earth MSc and PhD projects are fully funded for two years and four years, respectively (\$30K/yr which includes a Laurentian Graduate Assistantship) and include complete field and analytical support.



### **PhD Project 1 (Project ID 2021 02) and MSc Project 1 (Project ID 2021 03): Testing the diapirism-sagduction vertical tectonic model**

The projects propose to address the emplacement mechanisms of batholiths in Archean greenstone belts. The main questions are: (1) Were batholiths emplaced as near-horizontal tabular sheet intrusions or laccoliths that were deformed during subprovince accretion?; (2) Were they emplaced as diapirs during sagduction of the denser greenstones and partial convective overturn of the crust? Or were they emplaced during regional extension, exhumation and gravitational collapse of greenstone belts?; (3) Are there differences in batholith emplacement mechanisms in Mesoarchean and Neoproterozoic greenstone belts?; and (4) If present, do these changes reflect parallel changes in the geodynamic evolution of these greenstone belts? To address these questions, detailed structural, petrological, and geophysical studies will be done on batholiths in the Wabigoon and Abitibi subprovinces of the Archean Superior Province.

One **PhD student** is sought with interests in structural geology, igneous petrology, geochemistry, geochronology, and one **MSc student** are sought with interest in Geophysics. The two projects will be supervised by Drs. Bruno Lafrance and Stéphane Perrouty from Laurentian University and Dr. Lucie Mathieu from the Université du Québec à Chicoutimi.

### **MSc Project 2 (Project ID 2021 04): Exploration Maturity**

This project will compile databases of metal prospects and active and historic mines in the Abitibi and the Wabigoon. Using different analytical methods, the data will be analysed to determine the exploration maturity of different areas in greenstone belts. This will include compiling the number of diamond drill holes, exploration expenditures, and deposit distribution using creaming curves and Zipf analysis. As these analyses vary with the areas selected, the validity of these methods will be tested at different scales, ranging from deposits to camp to belt scale.

One **MSc student** is sought with interest in mineral exploration. The project will be supervised by Dr. Ross Sherlock at Laurentian University.

### **Application Process:**

To apply, please forward your application and cover letter to [merc@laurentian.ca](mailto:merc@laurentian.ca) and reference the Project Identification Number and position you are applying. The application should include: a CV including a list of publications and conference presentations, academic transcripts, contact details and the names of three referees. Review of applications will begin in February 2021, but applications will be accepted until May 2021.

*Laurentian University is a bilingual (French-English), tri-cultural institution. Laurentian University especially welcomes and encourages applications from members of visible minorities, women, Aboriginal persons, members of sexual minorities and persons with disabilities. Applicants may self-identify as a member of an employment equity group. All qualified candidates are encouraged to apply. However, Canadians and permanent residents will be considered first for these positions.*