

PDAC 2018 Short Course: An assessment of Precambrian gold deposit models from deep to shallow crustal levels

Saturday, March 3, 2018
9:00 AM - 5:00 PM

Organizer: Laurentian University, Mineral Exploration Research Centre

Precambrian greenstone belts are an important source of gold worldwide. With economic deposits becoming more difficult to discover, the challenge is how to focus scarce exploration dollars to the most prospective areas? This course will provide up-to-date information on deposit characteristics, a critical examination of current models, and examine key exploration criteria for a wide variety of gold deposits formed at shallow to deep crustal levels from the Superior Province to the Ashanti belt in Africa.

Research conducted by the MERC has provided a better understanding of the complex interplay of stratigraphy and structure in localizing gold mineralization by integrating regional to deposit scale mapping with geochemical, geochronologic, radiogenic and stable isotopic data in order to determine 'ore system-scale' controls and to identify vectors to economic mineralization. This course will utilize this expertise with topics that offer tools to help focus scarce exploration dollars on better quality targets including:

- Tectonic, lithological, structural and timing controls on world-class gold deposits within the Superior Province
- Structural assessment of gold deposits at higher metamorphic grades compared with deposits at lower metamorphic grades
- Evidence for superposition of ductile deformation on older intrusion-related gold deposits
- Gold deposit models assessed from a fluid chemistry perspective
- Key features of gold-rich VMS deposits
- Integration and interpretation of geological, geophysical, petrophysical and geochemical data sets to refine geological mapping, to determine controls on mineralization, and to develop gold exploration models to highlight current 2D/3D GIS-based techniques in the Abitibi and Ashanti greenstone belts
- More effective targeting criteria and methodologies applicable to exploration for gold deposits worldwide

COURSE FEE:

(includes course material, continental breakfast, three-course lunch and refreshments)

Early rate (until feb. 2, 2018)

Member: \$399

Non-member: \$499

Regular rate

Member: \$599

Non-member: \$699

Student: \$199

Presentations:

9:00-10:00	Comparison of the Setting and Timing of Abitibi Gold Deposits with other Large Camps in the Superior Province; John Ayer
10:20-11:20	An Assessment of Gold Deposit Models from a Fluid Chemistry Perspective; Daniel Kontak
11:20-12:20	Structural Settings of Gold Deposits in Low to High Metamorphic Grade Terranes; Bruno Lafrance
1:20-2:20	2D/3D GIS-based Integration for Gold Exploration in the Abitibi and Ashanti Greenstone Belts; Stéphane Perrouty
2:20-3:20	Key Features of Gold-rich VMS Deposits; Harold Gibson
3:40-4:40	Effective Exploration Targeting; Ross Sherlock
4:40-5:00	Summary and Conclusions

Presenters Bios:

Dr. John Ayer received BSc and MSc degrees from Carleton University and a PhD degree from the University of Ottawa (UO). He worked for 28 years with the Ontario Geological Survey (OGS) mapping Precambrian greenstone belts at detailed to regional scales across Ontario and 10 years for the exploration industry. Leader for the OGS Precambrian mapping group in the Abitibi, OGS representative on Targeted Geoscience Initiative 3 on the Abitibi and coordinator of the Greenstone Architecture project at Laurentian University (LU) under the Discover Abitibi Initiative. Associate Director of MERC since 2013. His academic interests include geochronology, stratigraphy and geodynamics with a focus on the controls of metal deposition in Archean Terranes.

Dr. Harold Gibson received a BSc degree from Queens University, and MSc and PhD degrees from Carleton University. He spent 10 years working with the exploration industry prior to joining the faculty at Laurentian University (LU) in 1990. His research is focused on understanding and documenting interrelationships between magmatism, volcanism, tectonics, and the timing of VMS ore systems during the construction and evolution of submarine volcanoes through time. As a full professor at LU and director of MERC he has guided its expansion from a Sudbury-focused centre in 2004, to a globally recognized, industry and government funded, collaborative mineral exploration and educational research centre, conducting research on Precambrian and younger ore systems. As the director of the newly initiated \$104 million Metal Earth project he is responsible for guiding research on crust to mantle scale metal endowment in the Canadian Shield.

Dr. Daniel J. Kontak has degrees from St. F.X. (BSc, 1976), the University of Alberta (MSc, 1980) and Queen's University (PhD, 1985). He worked for the Nova Scotia Department of Natural Resources for 20 years (1986-2006) before joining the faculty at Laurentian where he is now a Full Professor of Ore Deposit Geology. His work focuses on characterizing a wide variety of ore deposit types (e.g., Sn-W, REEs, rare metals, Zn-Pb, Au) in Canada and abroad (e.g., Peru, Argentina., India, Mongolia, Alaska) by integrating field observations with a variety of micro-analytical methods. His work has been recognized with awards from a variety of societies, including the Atlantic Geoscience Society, Mineralogical Association of Canada, and Mineral Deposits Division of the Geological Association of Canada.

Dr. Bruno Lafrance graduated from the University of New Brunswick with a PhD in structural geology in 1991, served three years as resident geologist in northern Saskatchewan, and joined Laurentian University in 1999, where he is a professor in structural geology, doing research on primary and secondary structural controls on ore deposits, and Associate Director of Metal Earth.

Dr. Ross Sherlock graduated from the University of Waterloo with a PhD on Economic Geology in 1993. Ross' career has spanned, junior and senior exploration companies, government surveys and consulting working nationally and internationally on a variety of deposit types and geologic terranes. Ross joined the faculty of Laurentian University in August 2017, as Chair of Exploration Targeting and Director of the Mineral Exploration Research Center.

Dr. Stéphane Perrouty joined Laurentian University in January 2018 as assistant professor of Precambrian Geology. He is a structural geologist who uses mineralogical, litho-geochemical, and geophysical tools to understand tectonic processes associated with Precambrian ore deposits. Stéphane obtained his PhD in 2012 from the University of Toulouse, in France, working on the structural evolution of the Ashanti Greenstone Belt. He subsequently held a Research Associate position at Western University for five years, working on the Canadian Malartic gold deposit in the Abitibi Greenstone Belt. He is currently involved in the NSERC-CMIC Exploration Footprints project, the AMIRA West African Exploration Initiative and the Metal Earth project.

