Discovering Ancient to Modern Earth
Découvrir la Terre Ancienne à Moderne

Second Circular

Sudbury 2023 GAC-MAC-SGA Joint Annual Meeting

24-27 May 2023

The geoscience community is invited to attend the **Geological Association of Canada – Mineralogical Association of Canada – Society for Geology Applied to Mineral Deposits Joint Annual Meeting** to be held in Sudbury, Ontario, Canada, **24-27 May 2023**, with pre- and post-meeting workshops and field trips.

Sudbury is one of the world's oldest, largest, and best-exposed meteorite impact sites on Earth, hosts one of the world's premiere Ni-Cu-PGE mining districts, and is surrounded by a wide range of superbly exposed Archean, Proterozoic, Paleozoic, and Quaternary rocks.

The City of Greater Sudbury, the largest city in northeastern Ontario, lies amidst glacially-shaped ridges, green boreal forests, and contains 330 lakes > 10 hectares and 110 lakes > 100 hectares. The success of more than 40 continuous years of environmental reclamation efforts has led to numerous national and international awards, including a Government of Canada, *Environmental Achievement Award*, a United States, *Chevron Conservation Award*, and a United Nations, *Local Government Honours Award*.

Meeting Theme

The theme of the meeting is **Discovering Ancient to Modern Earth**, reflecting the location of Sudbury at the intersection of the Archean Superior Province, Proterozoic Southern and Grenville Provinces, and Paleozoic-Quaternary cover sequences. The conference will include an exceptionally diverse program of **Symposia, Special Sessions, General Sessions, Field trips, Workshops,** and **Short Courses** covering the complete spectrum of geoscience disciplines.

Hosts and Partners

The meeting is being hosted by the *Harquail School of Earth Sciences* and *Mineral Exploration Research Centre* at Laurentian University, and is being sponsored by the *Geological Association of Canada*, the *Mineralogical Association of Canada*, and the *Society for Geology Applied to Mineral Deposits*.

Meeting Venue

The meeting will be held on the Laurentian University campus, which is located on the traditional lands of the Atikameksheng Anishnawbek. The City of Greater Sudbury also includes traditional lands of the Wahnapitae and Whitefish River First Nations.

Technical sessions will be in the **Fraser Auditorium** and **Classroom Buildings**. Posters and exhibit booths will be held in the **Parker Atrium**. Workshops and Short Courses will be held in the Harquail School of Earth Sciences in the **Willet Green Miller Centre**, which is across the road from the Fraser Complex and which also houses the *Ontario Geological Survey*, the *Ontario Geoscience Laboratories*,

and several other mineral and mining research centers. Maps will be posted on the website closer to the meeting and provided in the Registration package.

Meeting Format

Abstracts, talks, and posters can be given in English or French.

Oral Sessions

Oral sessions will include both **live (on-site)** and **pre-recorded (remote)** presentations, both broadcast live to remote participants via Zoom®. *None of the sessions will be recorded.*

Remote talks must be **pre-recorded and uploaded** to the conference website, but **remote presenters will be able to answer questions live via Zoom®**.

On-site talks should also be **pre-recorded and uploaded** to the conference website in case the presenters are unable to give them live.

Poster and Exhibit Sessions

There will be **dedicated poster and Exhibit sessions** on Thursday and Friday afternoons and all posters will be up for the duration of the meeting.

Posters must be **uploaded to the conference website** for viewing by remote participants, and presenters are encouraged to record and upload 5-minute "speed talks" on their posters.

Guidelines for pre-recording and **uploading presentations/posters** will be provided after acceptance.

Meeting Schedule

There will be 3 days of technical sessions, including plenary/keynote/invited/volunteered oral presentations, dedicated times for posters, pre- and post-meeting field trips, several workshops/short courses:

20-24 May 2023	Pre-meeting **field trips** and **workshops/short courses**
Wed 24 May 2023	**Exhibit set-up** and **On-Site Registration** (1100-1600), **GAC President's Reception** (1700-1830), **Icebreaker Reception** (1800-2100)
Thu 25 May 2023	**Oral sessions** (0800-1100, 1330-1630), **Plenary Session** (1100-1200), **GAC Award Luncheon** (1200-1330), **Poster/Exhibit Session** (0800-1100, 1330-1630), **Porketta Bingo** evening (1800-2100)
Fri 26 May 2023	**Oral sessions** (0800-1630), **Plenary Session** (1100-1200), **MAC Award Luncheon** (1200-1330), **Poster/Exhibit Session** (1630-1800), **Dynamic Earth** evening (1800-2100)
Sat 27 May 2023	**Oral sessions** (0800-1100, 1330-1630), **Plenary Session** (1100-1200), **MDD Award Luncheon** (1200-1330), **Closing Reception** (1630-1800), **Transport to downtown dining venues** (1800)
28-31 May 2023	Post-meeting **field trips** and **workshops/short courses** (see below)

Important Dates

01 March 2023	Deadline for **submission** of abstracts
01 April 2023	Deadline for **early registration** Deadline for **field trip, workshop, and short course registrations**
14 April 2023	Go/NoGo decisions for **field trips, workshops, and short courses**
24 April 2023	Deadline for **hotel "block" bookings**
23 May 2023	Deadline for **on-line registration**
24-27 May 2023	**On-site registration**

Meeting Registration

Early registration will be available on line until **01 April** and late registration will be available on line until **23 May**. On-site registration will be available between **24 and 27 May**.

Mode **Location**	**Live** **On Site**			**Virtual** **Remote**
Registration Category	*Before 01 April* **Full**	*After 01 April* **Full**	**Day**	**Full**
Professional* (member)	$500	$600	$250	$250
Professional* (non-member)	$600	$700	$300	$300
Student or Retiree (member)	$150	$200	$75	$75
Student or Retiree (non-member)	$250	$300	$125	$125
K-12 Teacher**	$100	$100	$50	$50
Guest	$50	$50		

plus 13% HST **university/college/government/industry/prospector, etc.* ***does not include Teacher Workshop W01*

Registration for **Award Luncheons**, **Field Trips**, **Workshops**, **Short Courses**, **Social Events**, and **Guest Activities** (rates below) can be done at the same time or separately. Provisions will be made for those with dietary restrictions and allergies.

	Registration Category			
Included	**Full-Meeting** ***On Site***	**Full-Meeting** ***Remote***	**Day** ***On-Site***	**Guest** ***On-Site***
Icebreaker reception (free, but registration mandatory)	✓			
Pocket program Downloadable digital abstract volume	✓ ✓	 ✓		
Access to technical sessions (oral and poster) Zoom® access to technical sessions	✓ ✓	 ✓		
Access to uploaded oral presentations and digital posters	✓	✓	✓	
Lunch(es) Morning/afternoon fluid/snack break(s)	✓ ✓		✓ ✓	✓ ✓
Access to exhibits	✓		✓	✓
Shuttle bus service from/to designated hotels (see below)	✓		✓	✓
Access to Guest Program				✓

Abstracts

Abstracts will be accepted only from authors who register for the conference and present their work in person or virtually in either poster or oral form. Presenters (oral/virtual/poster) can submit more than one abstract, which can be edited on line until the **final abstract deadline on 01 March**.

Abstracts must be less than 400 words, must not contain any references or figures, and must be submitted through the meeting **website**.

Submission of an abstract implies a commitment to attend the meeting and the abstracts of authors who do not subsequently register and attend the meeting will not be included in the abstract volume.

All presenters, including keynote and invited speakers, must pay the abstract fee and register after their abstract has been accepted. Invoices are provided automatically after registration.

GAC requests that all live speakers record their talks and upload them to the conference website. Guidelines for pre-recording presentations will be provided after 01 April.

Technical Program

Association/Division Lectures

A01 – GAC Presidential Address (Alwynne Beaudoin)

A02 – GAC Logan Medalist (TBA)

A03 – GAC-CSRG Middleton Medalist (Brian Pratt)

A04 – GAC-MDD Derry Medalist (Stephen Piercey)

A05 – GAC-MDD Gross Medalist (Christopher Lawley)

A06 – MAC Peacock Medalist (TBA)

A07 – MAC Young Scientist Award (TBA)

Symposia

SY01 – Critical Minerals in Canada: Commodity Overviews, Exploration Tools, and Method Development, Chairs: Evan Hastie (evan.hastie@ontario.ca), Eric Potter (eric.potter@canada.ca), Steve Beneteau (steve.beneteau@ontario.ca), Geneviève Marquis (genevieve.marquis@nrcan-rncan.gc.ca), Robert Cundari (robert.cundari@ontario.ca), Marcus Burnham (marcus.burnham@ontario.ca)

With Canada's exceptional mineral endowment, exploration expertise, and mining innovations, the country is well-positioned to respond to the global demand for critical minerals and materials to support the transition to a low-carbon economy. This two-day symposium will feature invited presentations on Canada's key critical mineral-material commodities, novel exploration tools, method development, and current research trends.

SY02 – Crustal Architecture and Metal Endowment, Chairs: Ross Sherlock (rsherlock@laurentian.ca), Bruno Lafrance (blafrance@laurentian.ca), Stéphane Perrouty (sperrouty@laurentian.ca)

This Symposium will highlight recent research outcomes in mapping crustal architecture in Precambrian shields and how this is related to base and precious metal endowment of the crust. It will draw researchers and industry geologists from Metal Earth and other collaborative research initiatives on Precambrian cratons.

SY03 – Magmatic Ore Deposits Associated with Mafic - Ultramafic Systems: A Tribute to the Career of Prof Sarah-Jane Barnes, Chairs: Michel Houlé (michel.houle@nrcan-rncan.gc.ca), Sarah Dare (sarah1_dare@uqac.ca), Anne-Aurélie Sappin (anne-aurélie.sappin@nrcan-rncan.gc.ca)

The energy transition taking place in Canada and elsewhere in the world is bringing renewed interest in critical elements, many of which (Ni, Cu, Co, PGE, Cr, Ti, V, and P) are recovered from various deposit types related to magmatic mafic-ultramafic mineral systems. This symposium is seeking to address key processes involved in the genesis of economic accumulation of these critical minerals, and advances in exploring for them, within established and emerging mining camps but also in frontier regions in Canada and elsewhere around the world. It is dedicated to the career of UCAC Prof Emerita Sarah-Jane Barnes (FRSC) who made significant contributions in our understanding over the years of these well-endowed mineralized systems worldwide.

SY04 – Orogenic Gold Deposit Metallogeny: A Symposium Honouring Dr Benoît Dubé, Chairs: Jochen Kolb (jochen.kolb@kit.edu), Georges Beaudoin (beaudoin@ggl.ulaval.ca), Iain Pitcairn (iain.pitcairn@geo.su.se), Nicolas Thébaud (nicolas.thebaud@uwa.edu.au)

Orogenic gold deposits are the most important gold source and attract wide recognition both in exploration, mining, and research. This symposium will feature presentations on the geology, fluid history,

P-T-X-t evolution of orogenic gold deposits by leading experts, combined with invited or volunteered contributions from researchers worldwide. It is dedicated to the career of Dr Benoît Dubé (1997 Robinson Lecturer, 2011 Duncan Derry Medalist, 1989-2022 Geological Survey of Canada) who made significant contributions in resource assessment and understanding of orogenic gold mineral systems in Canada, which are broadly applicable elsewhere.

SY05 – Sudbury Impact Structure, Chairs: Gordon Osinski (gosinski@uwo.ca), Michael Lesher (mlesher@laurentian.ca)

The Sudbury Structure is one of the world's oldest, largest, and best-exposed impact sites. This symposium will focus on all aspects relevant to the genesis of the structure, including shock features in the target rocks, the impact melt sheet and offset dikes, overlying fall-back/suevitic/phreatic breccias, and relevant analog experi-ments and numerical models. The nature and genesis of the Ni-Cu-PGE mineralization will be covered in SY03.

Special Sessions

SS01 – Advancements in Canadian Deep-Water Research, Chairs: Lilian Navarro (lilian_navarro@cbu.ca), Vittorio Maselli (vittorio.maselli@dal.ca), Elisabeth Steel (e.steel@queensu.ca)

Continental slopes and deep-sea basins not only host the majority of our energy reserves, but are also the loci of important geohazards such as submarine landslides, which can affect coastal communities. These basins have also become the target for the exploration of minerals that are critical for the energy transition. Numerous high-quality oceanographic, geophysical, and sedimentological studies along the continental slope and deep-water seafloors in Canada and worldwide, and high-resolution observations from outcropping deep-water rock sequences, have resulted in increased knowledge of deep-water processes and related deposits.

SS02 – Advances in Isotope Science: Methods and Applications of Non-Traditional Isotopes, Chairs: James Kidder (james.kidder@nrcan-rncan.gc.ca), Matthew Leybourne (m.leybourne@queensu.ca), Daniel Layton-Matthews (dlayton@queensu.ca)

Non-traditional stable isotopes have been increasingly used to study the fluxes among the Earth's major reservoirs and through the geological record. Our knowledge of isotope fractionation mechanisms and controls during chemical transport and deposition in these emerging stable isotope systems has grown in recent years. In this session we aim to select a diverse series of contributions from analytical method development and analysis through novel applications of non-traditional isotope geochemistry that tracks element migration and cycling between the Earth's geosphere, biosphere, and hydrosphere.

SS03 – Advances in Marine Geology and Geodynamics and their Application to Understanding Ancient Metallogenic Terranes, Chairs: Erin Bethell (ebethel2@uottawa.ca), Chris Galley (gchrist2@uottawa.ca), Alan Baxter (abaxter2@uottawa.ca), Mark Hannington (mark.hannington@uottawa.ca)

The present-day oceans provide a natural laboratory to observe the structural, kinematic and magmatic history of oceanic and arc crust, which comprise a significant proportion of greenstone belts and accreted terranes. This session will highlight studies using modern marine geophysical and acoustic datasets to understand the tectonic evolution of different domains of oceanic and arc crust. We invite contributions that use these datasets to advance our knowledge of marine geological processes and apply what is learned to ancient metallogenic greenstone belts and accreted terranes. This session is a contribution to the CFREF Metal Earth and NSERC iMAGE-CREATE programs.

SS04 – Advances in the Study of Accretionary Tectonics in the Paleozoic: From the Appalachians to Zagros, Chairs: Deanne van Rooyen et al. (deanne.vanrooyen@acadiau.ca)

Accretionary orogens in the Paleozoic span a vast range of orogenic styles and tectonic histories. This session seeks contributions on Paleozoic orogenic belts specifically focused on their evolution through

time, with a particular emphasis on comparative work between different areas, either within a specific orogenic belt or among different orogens. We look forward to welcoming contributions dealing with a wide range of orogenic belts worldwide.

SS05 – Advances in VMS Deposits: Genetic Models and Approaches to Mineral Exploration, Chairs: Frank Santaguida (frank.santaguida@glencore.ca), Harold Gibson (hgibson@laurentian.ca)

Volcanogenic massive sulfide deposits are among an economically important class of mineralization types globally. For example, VMS deposits currently account for over 16% of current world zinc production. The understanding of the genesis of these types of deposits continues to improve, resulting in successful approaches to exploring for new Zn-Pb-Cu-Ag-Au resources. The geodynamic setting of VMS deposits and the new technology that impacts mineral exploration will be discussed as invited keynote talks as well as more focused presentations. Topics will include predictive mapping/data modelling, geochemical signatures to host volcanic rocks, recent discoveries, and emerging terranes.

SS06 – All that Glitters is Cold: Advances in Quaternary Glacial Investigations, Chairs: Jessey Rice (jessey.rice@nrcan-rncan.gc.ca), Tyler Hodder (tyler.hodder@gov.mb.ca), Riley Mulligan (riley.mulligan@ontario.ca)

Our understanding of ice sheet dynamics, evolution, and sedimentary environments remains incomplete, despite its importance in identifying and managing groundwater and aggregate resources, the evaluation of potential geohazards, and facilitating drift prospecting efforts. This session welcomes submissions describing recent or ongoing investigations of modern to ancient glacial systems at regional, local or micro-scales that are guided by detailed fieldwork, lab analyses, geophysical and/or remotely sensed data. Reviews of complex, contentious, or historical issues are also welcome. We anticipate contributions that focus on themes of: subglacial erosional and depositional processes, landform genesis, stratigraphy, geochronology, geochemistry, paleoglaciological reconstructions.

SS07 – Anything but Boring: the Grenville Orogeny a Key into Mesoproterozoic Geodynamics, Chairs: Aphrodite Indares (aindares@mun.ca), Caroline lotout (clotout@mun.ca)

Global tectonic regimes in the Mesoproterozoic are the topic of heated debate, with end members invoking fragmented and active to single-lid and quiet lithosphere(s). The existence of orogens is clearly demonstrated during this time interval despite their tectonic style appearing to differ drastically from modern ones. This session explores distinctive characteristics of Mesoproterozoic orogens by focusing on the Grenville province and its wider context. We hope to bring together new insights on synorogenic magmatism, metamorphic P-T gradients and timescales of metamorphism, that can inform on thickness of orogenic crust, thermal regimes, and tectonothermal evolution. In a broader sense, we encourage contributions to any aspect of Mesoproterozoic plate tectonics. We welcome all types of studies from field-based, magmatic, metamorphic, geochronological, to numerical modeling and geophysical perspectives, and multidisciplinary approaches that integrate across research areas.

SS08 – Archean Craton Assembly, Chairs: Antoine Godet (antoine.godet.1@ulaval.ca), Carl Guilmette (carl.guilmette@ggl.ulaval.ca), Doug Tinkham (dtinkham@laurentian.ca)

A fundamental outstanding question in Earth sciences is what kind of tectonics operated during the Archean, and when and how did plate tectonics initiate and evolve. The global convection regime is argued to have evolved from early tectonic regimes, including plume tectonics, asymmetric subduction, multiple juvenile arc-accretion, and mantle overturn tectonics, into modern global plate tectonics. The occurrence of contrasting plutonic and tectonometamorphic styles during the Neoarchean and Paleoproterozoic Era implies that this period was a pivotal point, but the timing, duration, and geological expression of this transition are still debated. We invite multidisciplinary research that aims to better understand Archean craton assembly worldwide.

SS09 – Canadian Journal of Earth Sciences at 60: Celebrating Canadian Geoscience and Geoscientists, Chairs: Sally Pehrsson (sally.pehrsson@ nrcan-rncan.gc.ca), Brendan Murphy (bmurphy@stfx.ca)

The Canadian Journal of Earth Sciences turns 60 years old in January 2023 and this symposium will celebrate advances in Canadian geosciences that have provided seminal contributions to many subdisciplines of the Earth Sciences, including the development of the plate tectonic paradigm in ancient and modern orogens, the genesis of different types of mineral deposits, precise geochronology (which enables us to measure the pulse of the Earth), the evolution and extinction of various life-forms (from Dinosaurs to Dinoflagellates), oxygenation of the atmosphere over time, geophysics of the Earth's interior, and the forces that create and destroy mountains.

SS10 – Cratons, Kimberlites, and Diamonds, Chairs: Thomas Stachel (tstachel@ualberta.ca), Yana Fedortchouk, (yana@dal.ca), Maya Kopylova (mkopylov@eos.ubc.ca), D. Graham Pearson (gdpearso@ualberta.ca)

This session invites presentations covering advances in the fields of: 1) Origin and evolution of cratonic lithosphere (mantle xenolith/xenocryst studies; geophysical research cratonic mantle roots, etc.), 2) Processes of diamond formation (trace elements and stable isotopes in diamond; Diamond-forming fluids/melts and reactions; Inclusions in diamond; Surface textures), 3) Kimberlite research (from petrogenesis to emplacement), and 4) Advances in diamond exploration techniques (indicator mineral chemistry, geothermobarometry, etc.).

SS11 – Environmental Aspects of Mine Waste, Chairs: Ian Power (ianpower@trentu.ca), Sasha Wilson (sawilson@ualberta.ca), Matthew Lindsay (matt.lindsay@usask.ca)

This session will broadly focus on environmental aspects of mine wastes including geochemistry, mineralogy, geomicrobiology, hydrogeology, and modeling. We invite abstracts on various topics including, but not limited to, acid generation, redox cycling, metal attenuation, carbon mineralization, isotopic tracers, solute transport, and reactive transport modeling. Submissions focused on abandoned or operating mines across various commodities are welcome. We also welcome submissions focused on re-utilization of mine wastes including their potential as critical mineral sources.

SS12 – Environmental Restoration: Lessons from Sudbury's Recovery and Beyond, Chairs: Nadia Mykytczuk (nmykytczuk@mirarco.org), Graeme Spiers (gasp.lulu@gmail.com)

Sudbury's incredible environmental recovery stands on 40 years of diverse research that demonstrate the feasibility of large-scale restoration is possible. This session will feature syntheses of long-term research as well as ongoing project and new initiatives that move from landscape restoration, to carbon sequestration, recovery of mining environments, and land-water linkages, all under the new challenges imposed by climate change. It is designed as a companion to the 2-day workshop W02 - Environmental Remediation: Global Lessons from the Sudbury Story.

SS13 – Geobiology of the Late Archean to Early Paleoproterozoic Surface World and its Impacts on Proterozoic Evolution, Chairs: Michael Babechuk (mbabechuk@mun.ca), Leslie Robbins (leslie.robbins@uregina.ca), Galen Halverson (galen.halverson@mcgill.ca), Kurt Konhauser (kurtk@ualberta.ca)

The late Archean to early Paleoproterozoic was a critical time in the co-evolution of life and Earth's surface environment. It included the formation of large and emergent continents, the relatively rapid oxygenation of the atmosphere, unprecedented acid rock drainage, several global glaciations, periods of high marine primary productivity, the evolution of aerobic metabolisms, and potentially the origins of eukaryotic cells. This session encourages contributions documenting novel approaches and insights that may include chemostratigraphy and detailed sedimentology, non-traditional stable isotope geochemistry, modelling approaches, geomicrobiology, phylogenomics, or the statistical analysis of large

datasets, amongst others. We seek a diverse array of presenters and particularly encourage submissions from early-career researchers and graduate/undergraduate students.

SS14 – Geophysics for Minerals and Mineral Systems, Chairs: Richard Smith (rssmith@laurentian.ca), Callum Walter (11caw13@queensu.ca), Hema Sharma (hsharm3@uwo.ca), Rajesh Vayavur (rvayavur@laurentian.ca)

This session will discuss the latest innovations in geophysics in the exploration for and understanding of mineral deposits and the associated mineral systems. The methods can use active and passive sources and be deployed on airborne vehicles, on the ground, or down boreholes. The studies can be regional, extending to mantle depth, or local to the ore deposit. Physical properties studies are also of interest, as these can help in the understanding of the characteristics of mineral deposits. Papers that discuss methods to process, model, invert and interpret the geophysical data (with geological data) are also welcome in the session.

SS15 – Geoscience Education and Communication, Chairs: Lesley Hymers (lhymers@miningmatters.ca), Deana Schwarz (dschwar3@uwo.ca), Veronica Klassen (veronicaklassen5@gmail.com), Beth McLarty Halfkenny (beth.mclartyhalfkenny@carleton.ca), Courtney Onstad (courtney_onstad@sfu.ca)

The topics that will be explored in this symposium include the theory and practice of formal and informal geoscience education and communication. The audience for this symposium includes geoscience education and communication researchers, and practicing informal and formal educators and communicators, including those from academia (faculty, graduate students and graduate teaching assistants); government; and Industry, across Canada.

SS16 – Impact Processes on Solar System Bodies: A Special Session in Memory of Erin Walton, Chairs: Gordon Osinski (gosinski@uwo.ca), Christy Caudill (ccaudill@uwo.ca)

The impact of asteroids and comets with planetary bodies is one of the most fundamental geological processes in the solar system. This special session will focus on all aspects of the impact cratering process, products, and effects, and on all solar system bodies. Field studies, sample analysis, remote sensing, modelling, and experimental studies will be welcome. This special session will be dedicated to Dr. Erin Walton (MacEwan University, Edmonton), an outstanding early career researcher and expert in shock processes who passed away in August 2022.

SS17 – Integrated Studies in Paleozoic Basins: Life, Environments, Resources, Chairs: Nikole Bingham-Koslowski (nikole.bingham-koslowski@nrcan-rncan.gc.ca), Michelle Coyne (michelle.coyne@nrcan-rncan.gc.ca)

This session aims to highlight research related to sedimentary basins, both onshore and offshore, with a focus on the Paleozoic. We welcome submissions on topics relevant to the study of Paleozoic basins including, but by no means limited to, sedimentology, stratigraphy, paleontology, paleoecology, paleoenvironmental interpretation, petrography, geochemistry, seismic interpretation, tectonic evolution, and resource potential.

SS18 – Iron-rich Au, Ag, Bi, Co, Cu, F, Mo, Nb, P, Pb, REE, U, Zn, PGE Mineralization: Genetic Processes and Feedback Mechanisms between Magmatism and Metasomatism, Chairs: Wyatt Bain (wmbain@lakeheadu.ca), Louise Corriveau (louise.corriveau@nrcan-rncan.gc.ca), Jean-Francois Montreuil (jfmontreuil@macdonaldmines.com)

Extreme iron enrichment is common in a range of distinct but mineralogically similar critical mineral-rich deposits. As the demand for critical minerals grows, so will our need to understand the metasomatic and magmatic processes leading to Fe and critical metal enrichment in IOCG, IOA, metasomatic iron, nelsonite, carbonatite, and magnetite-rich cumulate, and other iron-rich deposits types within the broader context of their host mineral systems. In this symposium, we invite talks on the field geology, metallogeny, petrology, mineralogy, geochemistry, and fluid/melt evolution of Fe-rich critical

mineral systems with the aim of illuminating intersections in genetic mechanisms and feedback between magmatic, metasomatic, and tectonic processes in forming Fe-rich critical mineral-rich deposits.

SS19 – Isotopes in Ore Deposits and their Utilization in Exploration, Chairs: Bertrand Rottier (bertrand.rottier@ggl.ulaval.ca), Crystal Laflamme (crystal.laflamme@ggl.ulaval.ca), Guillaume Barré (guillaume.barre@ggl.ulaval.ca), Georges Beaudoin (georges.beaudoin@ggl.ulaval.ca)

Ore deposits are loci where mass and energy concentrative processes take place, and isotopes are unrivalled indicators of the variety of processes involving these material fluxes. Although not yet regularly employed in mineral exploration programs, isotopes have the potential to be powerful tools to understand metal and volatile sources, depositional ages, and as fertility indicators and vectoring tools. We invite studies pertaining to the advancements in analytical techniques and our understanding of how isotope systems including light and metal stable isotopes, radiogenic isotopes and clumped isotopes can be used in mineral exploration.

SS20 – Lithium in Pegmatites: Mineralogy, Petrogenesis and Classic to Innovative Exploration Techniques, Chairs: Tania Martins (tania.martins@gov.mb.ca), Axel Muller (a.b.muller@nhm.uio.no), Joana Cardoso-Fernandes (joana.fernandes@fc.up.pt), Encarnacion Roda-Robles (encar.roda@ehu.eus), Lee Groat (groat@mail.ubc.ca)

Pegmatites are an important source of many of the elements considered critical, particularly lithium, cesium, tantalum, tin, and beryllium. Lithium is a particularly critical element, as it is a key component in batteries for electric vehicles and is vital to Canada's and the European Union's growing green economy and the decarbonisation transition. We invite presentations that will further our knowledge of these enigmatic rocks, e.g. pegmatite mineralogy, petrogenesis, and classic to innovative exploration techniques.

SS21 – Mineral Exploration Footprints, Chairs: Stéphane Perrouty (sperrouty@laurentian.ca), Kevin Ansdell (kevin.ansdell@usask.ca), Robert Lee (rglee17@gmail.com)

Expanding the size of a target leads to more efficient mineral exploration approaches in greenfield settings and at depth. This session aims to build on the legacy of the NSERC - Canada Mining Innovation Council - Mineral Exploration Footprints Program (2013-2018) to introduce new advances in economic geology that investigate the distal signature of major ore systems, including but not limited to orogenic gold, porphyry copper, uranium, lithium, magmatic and volcanogenic deposits. Presentations on any aspect of the geological, geochemical, isotopic, mineralogical, structural and/or petrophysical components of a footprint are welcomed.

SS22 – New Insights on Cordilleran Magmatism and Tectonics: from Rifted Margin to Continental Arc Systems, Chairs: Rosie Cobbett (rosie.cobbett@yukon.ca), Luke Beranek (lberanek@mun.ca), Justin Strauss (justin.v.strauss@dartmouth.edu), David Moynihan (david.moynihan@yukon.ca)

The western passive margin of Laurentia formed after Neoproterozoic to early Paleozoic extension associated with the breakup of Rodinia. This continental margin was subsequently modified by poorly understood mid-Paleozoic subduction initiation, as well as the eventual development of the Mesozoic-Cenozoic Cordilleran active margin. In this session, we invite multidisciplinary submissions that provide new insights into magmatism, sedimentation, and/or deformation associated with each phase of western Laurentia's Neoproterozoic to Recent development.

SS23 – On the Beam: Advances and Applications in In-Situ Microanalysis and Geochronology, Chair: Kirk Ross (kross@laurentian.ca)

In-situ microanalytical techniques, including EPMA, QSEM, CL, SIMS, and LA-ICPMS, have been used for decades to acquire elemental and isotopic compositional data from targeted micron-scale domains. Technological advances in primary beam characteristics, spectrometry, and data processing

are now enabling a wide range of new analytical techniques and petrological, geochemical, and geochronological research questions to be addressed. This includes increasingly high-resolution (trace) element mapping, measurement of low-mass volatile elements and isotopic systems with polyatomic or isobaric interferences, and innovative data visualization and plotting methods. This session welcomes contributions highlighting methodological advances and novel geoscience applications across the spectrum of in-situ microanalytical techniques.

SS25 – Precambrian Depositional and Environmental Systems, Chairs: Maxwell Lechte (maxwell.lechte@mail.mcgill.ca), Nabil Shawwa (NabilShawwa@cmail.carleton.ca), Mollie Patzke (mpatzke@laurentian.ca)

The sedimentary record offers a unique window into the evolution of surface systems and the biosphere on the early Earth. Sudbury is the location of the Huronian Supergroup, an important Precambrian sedimentary sequence. With this in mind, this session aims to explore the different facets of Precambrian sedimentology and environmental change. Presentations for this session include, but are not limited to, Precambrian depositional environments, the fossil record, paleoclimate, paleoredox constraints, geochemistry, and stratigraphic correlations. We invite researchers with any insightful contributions related to Huronian Supergroup stratigraphy, other Canadian Precambrian basins, or the Precambrian stratigraphic record in general.

SS26 – Rare Metals in Igneous Systems, Chairs: Zsuzsanna Magyarosi (zsuzsannamagyarosi@gov.nl.ca), Nadia Mohammadi (nadia.mohammadi@nrcan-rncan.gc.ca), Zeinab Azadbakht (zeinab.azadbakht@ontario.ca), Tarryn Cawood (tarryn.cawood@nrcan-rncan.gc.ca), Anne-Aurélie Sappin (anne-aurelie.sappin@nrcan-rncan.gc.ca)

Rare critical metals, including REEs, Y, Nb, Li, Cs, and Ta, play an important role in Canada's transition to a low carbon economy. In this session, we welcome contributions that highlight advanced methods of targeting prospective regions for rare metals and address their genesis, geochemistry, geochronology, mineralogy, and metallurgy with special emphasis on their economic aspects within various igneous systems.

SS27 – Spectroscopic Mineral Analysis, Chairs: Philip Lypaczewski (philip.lypaczewski@cna.nl.ca), Derek Wilton (dwilton@esd.mun.ca), Gary Thompson (gary.thompson@cna.nl.ca)

In an exploration context, mineralogical alteration patterns can serve as powerful vectors towards mineralization. Spectroscopic mineral analysis techniques allow for the objective and quantitative identification of mineralogy at a variety of scales and can therefore be an effective exploration tool. This session will focus on studies involving the use of any portable, lab-based, or airborne instrumentation that provide spectroscopic data used for the quantitative analysis of mineralogy, in a mineral exploration context or otherwise. Advances in the fundamental understanding of infrared spectroscopy (including hyperspectral imaging), X-Ray fluorescence (XRF), Laser Induced Breakdown Spectroscopy (LIBS) or other techniques, as well as applied uses are welcomed.

SS28 – Subsurface Energy Storage in Geologic Media: Hydrogen, CAES, and CO2-Sequestration: Preparing for New Energy Economy, Chairs: Frank Brunton (frank.brunton@ontario.ca), James Brydie (james.brydie@nrcan-rncan.gc.ca), Nick Utting (nicholas.utting@nrcan-rncan.gc.ca), Nirmal Gnanapragasam (nirmal.gnanapragasam@cnl.ca)

This special session will outline new and ongoing projects / initiatives lead by NRCan and the Ontario Geological Survey and Canadian Nuclear Laboratories to examine potential for safe subsurface storage of Hydrogen and Compressed Air, and the sequestration of Carbon Dioxide in different geological settings.

General Sessions

GS01 - Economic Geology, Chairs: Daniel Gregory (daniel.gregory@utoronto.ca), Merilie Reynolds (Merilie_Reynolds@gov.nt.ca)
GS02 - Environmental Geology, Chairs: David Pearson (dpearson@laurentian.ca), Alan Lock
GS03 - Geochemistry, Geochronology, Chairs: Steve Piercey (spiercey@mun.ca), Jacob Hanley (jacob.hanley@smu.ca)
GS04 - Geophysics, Chairs: Richard Smith (rssmith@laurentian.ca), Hema Sharma (hsharm3@uwo.ca), Rajesh Vayavur (rvayavur@laurentian.ca), Callum Walter (11caw13@queensu.ca)
GS05 - Geoscience Education, Chair: Tobias Roth (tm_roth@laurentian.ca)
GS06 - Hydrogeology, Chair: Laura Colgrove (laura.colgrove@ontario.ca)
GS07 - Igneous and Metamorphic Geology, Volcanology, Chairs: Doug Tinkham (dtinkham@laurentian.ca), Manuel Duguet (manuel.duget@ontario.ca)
GS09 - Mathematical Geology, Chairs: Cliff Stanley (cliff.stanley@acadiau.ca), Eric Grunsky (egrunsky@gmail.com)
GS10 - Mineralogy, Crystallography, Chairs: Andrew Conly (aconly@lakeheadu.ca), Shannon Zurveniski (shay@lakeheadu.ca)
GS11 - Paleontology, Chairs: Nikole Bingham-Koslowski (nikole.bingham-koslowski@nrcan-rncan.gc.ca), Katie Maloney (katie.maloney@mail.mcgill.ca)
GS12 - Planetary Geology, Chairs: Gordon Osinski (gosinski@uwo.ca), Chris Herd <herd@ualberta.ca>
GS13 - Sedimentology, Stratigraphy, Chairs: Maxwell Lechte (maxwell.lechte@mail.mcgill.ca), Nabil Shawwa (NabilShawwa@cmail.carleton.ca)
GS14 - Structural Geology, Tectonics, Chairs: Deanne van Rooyen (deanne.vanrooyen@acadiau.ca), Nikole Nikole Bingham-Koslowski (nikole.bingham-koslowski@nrcan-rncan.gc.ca)

Field Trips

Field Trips have minimum attendance requirements. If cancelled for any reason, participants will receive a full refund.

The Mineral Deposits Division (MDD) of the Geological Association of Canada and the Mineral Exploration Research Centre (MERC) of Laurentian University will provide $5,000 each to support the economic geology field trips: FT01, FT02, FT03, FT07, FT09, FT10. The first 8 eligible students to register for those field trips will be offered a 25% refund on their registration fee.

FT01 - Base, Critical, and Precious Metals Mineralization in the Metasomatic Iron and Alkali-Calcic Systems of the Southern Province in the Sudbury Area, Leaders: Jean-Francois Montreuil (Jean-François Montreuil montreuil.jean.francois@gmail.com), Louise Corriveau (louise.corriveau@nrcan-rncan.gc.ca), Wyatt Bain (wmbain@lakeheadu.ca), **Sponsor**: MacDonald Mines, **Duration**: 2 days, post-meeting, 28-29 May. **Registration**: $375 + HST, **Maximum**: 19 participants *(snacks and lunches included, accommodation in Sudbury not included).*

Regional metasomatic iron and alkali-calcic (MIAC) systems are a key exploration target for primary critical mineral deposits, including IOCGs and IOAs. The MIAC system of the SPJ property in the Southern Province comprises base, critical and precious metal showings, prospects and historic mines (Ni, Cu-Ag-Au, Au, Co and REE) such as the Scadding deposit, the largest gold mine in the Sudbury area. Outcrops and drill cores surveyed during this trip highlight the progression of albitization, brecciation, overprinting iron-rich to iron-poor alteration facies and mineralization in Huronian sedimentary rocks along fault zones. Metasomatic linkages among mineralization types and alteration facies help to define a deposit classification for MIAC systems and develop predictive models for the prospectivity of MIAC systems based on the distribution of alteration facies. Discussions during the field trip will also cover the genesis of these mineral systems

FT02 - Discovering the Abitibi Gold Belt, Leaders: Stéphane Perrouty (sperrouty@laurentian.ca), Ross Sherlock (rsherlock@laurentian.ca), Jack Simmons (jsimmons@laurentian.ca), **Sponsor**: MERC, **Duration**: 4 days, pre-meeting, 20-21-22-23 May. **Registration**: $1220 + HST, **Maximum**: 29 participants *(meals not included, accommodation included, double occupancy)*

With over 300 Moz Au, the Abitibi is the world's most endowed Precambrian greenstone belt. This 4-day field trip aims to introduce the regional lithostratigraphy, major deformation zones, and key mineral deposits between Timmins (ON) and Val d'Or (QC). Our program includes mine tours and drill core viewing at the world-class metakomatiite-hosted Kerr Addison gold camp (~11 Moz) near Larder Lake, metabasalt-hosted Sigma-Lamaque gold camp (15 Moz) near Val d'Or, and metasediment-hosted Canadian Malartic gold camp (~26 Moz). Day 1 will be in Timmins, Day 2 in Kirkland Lake, Day 3 in Larder Lake and Rouyn-Noranda, and Day 4 in Val d'Or and Malartic.

FT03 - Geological Traverse of the Sudbury Impact Structure and Evolution of the Impact Melt, Leaders: Dustin Peters (dpeters@laurentian.ca), Sandra Baurier-Aymat (sbaurier_aymat@laurentian.ca), Shirley Peloquin (Shirley.Peloquin@ontario.ca), Caroline Gordon (caroline.gordon@ontario.ca), **Sponsor**: MERC, **Duration**: 1 day, pre-meeting, 24 May. **Registration:** $170 + HST, **Maximum:** 30 participants *(snacks and lunch included, accommodation in Sudbury not included)*

This 1-day field trip will take participants on a geological traverse across the Sudbury Structure, one of the world's oldest, largest, and best-preserved impact structures. From shatter cones and pseudotachylite bodies in the target rocks, over impact-melt related breccias and intrusions, to the world class magmatic Ni-Cu-(PGE) sulfide mineralization, participants will be able to examine a variety of geological features that bear witness to the unique origin and complex evolution of the Sudbury Structure.

FT04 - Geology of Manitoulin Island, Leaders: Frank Brunton (frank.brunton@ontario.ca), Catherine Béland Otis (catherine.béland.otis@ontario.ca), Katherine Hahn (katherine.hahn@ontario.ca), Patrick Julig (pjulig@laurentian.ca), **Sponsor**: OGS, **Duration**: 2 days, pre-meeting, 23-24 May. **Registration**: $610 + HST, **Maximum**: 12 participants *(snacks and lunches included, accommodation included, double occupancy)*

This 2-day field trip will introduce participants to one of the few places in the Great Lakes Region where Upper Ordovician and Lower Silurian sedimentary strata form prominent escarpments and cuestas. Manitoulin and surrounding islands have a distinguished paleontological and geological history, where arguably some of the first fossils were formally described in Canada, and where variably rich shelly faunas and extensive patch reef and barrier reef tracts flourished at different times proximal to Proterozoic highlands. Day 1 focuses on Upper Ordovician stratigraphy and includes a newly discovered bentonite(?) horizon, classic rocky shore and hydrocarbon source rock exposures, and concludes with a late lunch at the Sheguiandah Museum and an awesome hike through one of the oldest indigenous stone quarry sites in Canada! Day 2 includes examination of Upper Ordovician and Lower Silurian strata and then a drive back to Sudbury for the icebreaker. The field guide provides an updated lithostratigraphic chart and brief descriptions of select road-side and quarry outcrops along Highway 6 from Birch, Great La Cloche and Goat Islands, and from Little Current to east-central region (Highway 542 & Highway 6 area) of Manitoulin Island.

FT05 - Ice on the Rocks: Quaternary Geology of the Sudbury Region, Leaders: Andrea Marich (andrea.marich@ontario.ca), Riley Mulligan (riley.mulligan@ontario.ca), Abigail Burt (abigail.burt@ontario.ca), Grant Hagedorn (grant.hagedorn@ontario.ca), **Sponsor**: OGS, **Duration**: 1 day, post-meeting, 28 May. **Registration**: $160 + HST, **Maximum**: 21 participants *(snacks and lunches included, accommodation in Sudbury not included)*

The Sudbury area is famed for its unique bedrock geology and mineral endowments, but the region also boasts a stunning record of past glaciations. Bedrock erosional features are ubiquitous with past ice sheets accentuating major geological structures and heterogeneous bedrock lithologies. Guided by

surficial mapping and new Lidar data, this 1-day field trip will take participants to prominent bedrock- and sediment-cored streamlined landforms, moraine systems, shoreline features, as well as anthropogenic developments related to the region's long history of mining. Sudbury's unique geological setting provides a backdrop to discuss glacial processes, paleo-environments and the relationships between ice, rock, sediment, water, vegetation, and humans.

FT06 - Multiscale and Polyphase Deformation Structures in the Grenville Front Tectonic Zone near Sudbury, Leaders: Dazhi Jiang (djiang3@uwo.ca), Changcheng Li (changcheng.li@uwaterloo.ca), **Sponsor**: Western U, **Duration**: 1 day, post-meeting, 28 May. **Registration**: $290 + HST, **Maximum**: 20 participants *(snacks and lunches included, accommodation in Sudbury not included).*

This 1-day field trip will focus on the geology of deformation structures developed in Grenvillian Orogeny. Outcrops (in Sudbury or nearby areas) in the Grenville Front Tectonic Zone and potentially in the Britt domain will be visited to unveil the geometry and the kinematics of the deformation structures. These geological structures record middle/lower crust deformation in the Ottawan phase of the Grenvillian Orogeny, extension during the mountain collapse, and folding and thrusting in the continuing convergence in the Rigolet phase of the Grenvillian Orogeny. A mylonite zone (a textbook example) produced in the thrusting at the Grenville Front may be visited in the trip.

FT07 - Exploring Differential Metal Endowment: A comparison of the Eastern (Rouyn-Noranda) and Western (Swayze) Abitibi Greenstone Belt, Leaders: Harold Gibson (hgibson@laurentian.ca), Thomas Gemmel (thomas.gemmel@ontario.ca), Taus Jørgensen (tjoergensen@laurentian.ca), Evan Hastie (evan.hastie@ontario.ca), Marina Schofield (mschofield@laurentian.ca), Ras Haugaard (rnielsen@*laurentian*.ca. **Sponsor**: MERC, **Duration**: 4 days, post-meeting, 28-29-30-31 May. **Registration**: $1470 + HST, **Maximum**: 20 participants *(all meals included, accommodation included, single occupancy for 2 nights, double occupancy for 2 nights).*

This 4-day field trip explores processes responsible for the differential base and precious metal endowment of Archean greenstone belts. This will be achieved through a comparison of the geology and crustal architecture of the base and precious metal endowed Noranda District of the eastern Abitibi Greenstone Belt, Quebec and the lesser metal endowed Swayze area of the western Abitibi Greenstone Belt, Ontario. Processes affecting metal endowment will be linked to surface geological features and features identified in the crustal architecture of both areas as defined through seismic, MT and gravity surveys.

FT08 - Paleoproterozoic Glacial, Microbially Induced, Tidal, and Seismic Deposits of the Huronian Supergroup, Elliot Lake Region, Canada, Leaders: Patricia Corcoran (pcorcor@uwo.ca), Carolyn M. Hill-Svehla (chill59@uwo.ca), **Sponsor**: Western U, **Duration**: 2 days, pre-meeting, 23-24 May. **Registration**: $520 + HST, **Maximum**: 12 participants *(snacks and lunches included, accommodation included, double occupancy)*.

The rocks of the Paleoproterozoic Huronian Supergroup will be examined at various locations in northwestern Ontario on this 2-day field trip. We will view outstanding examples of ancient glacial deposits (including varves and dropstones), microbially induced sedimentary structures (MISS), tidally influenced deposits (flaser and lenticular beds, herringbone crossbeds) and structures interpreted as seismic-related deposits (slump structures, clastic dykes, soft-sediment deformation structures). The trip will enable visits to most of the formations comprising the Huronian Supergroup.

FT09 - Sudbury Offset Dikes and Associated Ni-Cu-PGE Mineralization, Leaders: Henning Seibel (hseibel@laurentian.ca), Michael Lesher (mlesher@laurentian.ca), **Sponsor**: MERC, **Duration**: 3 days, post-meeting, 28-29-30 May. **Registration**: $375 + HST, **Maximum***: 26 participants (snacks and lunches included, accommodation in Sudbury not included).*

This 3-day trip will highlight the geology and genesis of nested radial and concentric dikes containing inclusion- and sulfide-free impact melts, inclusion- and sulfide-rich impact melts, and anatectic breccias, which provide critical constraints on the genesis of the Ni-Cu-PGE mineralization. Day 1: Transect through the Sudbury Structure (footwall rocks, Main Mass, Onaping Formation, Hess Offset). Day 2: Copper Cliff, Worthington, Vermillion, and Trill offset dikes. Day 3: Parkin and other offset dikes. All outcrops to be visited have been mechanically and hydraulically stripped, and most are glacially polished.

FT10 - Orogenic and Intrusion-Related Gold Deposits of the Michipicoten and Mishibishu Greenstone Belts in the Wawa Region, with an Emphasis on the Structural Framework, Leaders: Chong Ma (cma@laurentian.ca), Lianna Vice (lianna.vice@ontario.ca), Carl Nagy (carl.nagy@alamosgold.com), Zachary Adam (zvadam@uwaterloo.ca), Danielle Shirriff (danielle.shirriff@alamosgold.com), Bruno Lafrance (blafrance@laurentian.ca), Lise Robichaud (lise.robichaud@ontario.ca), **Sponsor**: MERC, **Duration**: 3 days, pre-meeting, 22-23-24 May. **Registration**: $760 + HST, **Maximum**: 24 participants *(snacks and lunches included, accommodation included, double occupancy).*

This 3-day trip will highlight the geologic and structural framework of orogenic and intrusion-related gold deposits in the easternmost Wawa subprovince. Day 1: Renabie mine in the northeastern Michipicoten greenstone belt. Day 2: Shear zone-hosted gold mineralization around the Jubilee stock in the southern Michipicoten greenstone belt in the morning and Eagle River mine of the Mishibishu greenstone belt in the afternoon. Day 3: Island Gold mine in the Goudreau deformation zone of the northern Michipicoten greenstone belt.

Workshops

Workshops have minimum attendance requirements. If cancelled for any reason, participants will receive a full refund.

W01 - Curriculum Connections, Educator Professional Learning (K-12), Leaders: Lesley Hymers (lhymers@miningmatters.ca), Deana Schwarz (dschwar3@uwo.ca), Veronica Klassen (veronicaklassen5@gmail.com), **Sponsors**: Mining Matters/APGO Education Foundation/EdGEO/Canadian Geoscience Education Network, **Duration**: 1 day, post-meeting, 28 May. **Maximum** 25. **Teachers** $25 + HST including lunch, coffee/tea/snack breaks, educational resources for the classroom, including mineral and rock samples, equipment, lesson plans, and publications, and a Field Trip Guide.
In this 1-day workshop, educators will participate in a hands-on Earth sciences instructional development session, held in the Harquail School of Earth Sciences. The workshop will conclude with a local field trip exploring the geology on the Laurentian University Campus. The focus of the workshop will be connecting content themes to the elementary and secondary curricula through geology, biology, environmental science, chemistry, geography, and the arts, and providing teachers and students with an accessible location where they can explore local geology in the field.

W02 - Environmental Remediation: Sudbury's Award-Winning Reclamation and Remediation Story, **Leaders**: Nadia Mykytczuk (nmykytczuk@laurentian.ca), Graeme Spiers (gspiers@laurentian.ca), **Sponsor**: Goodman School of Mines, **Duration**: 2 days (workshop and field trip), pre-meeting, 23-24 May. **Students and Professionals**: $250 + HST, **Maximum**: 25 participants, including lunches, coffee/tea/snack breaks, bus transport to field exposures, and course notes.

Learn how it is possible to restore an industrially damaged landscape and community from Sudbury's award-winning reclamation and remediation story; a successful model on how to restore land, water, and mining environments within a sustainable community. Reviews the application of established and new innovative techniques in remediation, soil rehabilitation, pollutant neutralization and sequestration, biomining, and the creation of novel ecosystems. Features current and ongoing research initiatives and outlines ongoing challenges while making the science and methods transferable to other damaged sites globally. Includes a 1½ day workshop in Environmental Remediation and a 2-3 hour field trip to explore remediated sites around Sudbury.

W03 - Iolite 4: Advances in LA-ICPMS Data Processing and Visualization, Leader: Joe Petrus (japetrus@gmail.com), **Sponsor**: MERC, **Duration**: 1 day, post-meeting, 28 May. **Students** $37 + HST, **Professionals** $74 + HST, **Maximum**: 40 participants, including lunch, coffee/tea/snack breaks, and digital course notes.

LA-ICPMS applications are ever expanding, as technological developments enable increasingly sophisticated analytical techniques and data collection methods. Iolite 4 offers unparalleled ICPMS data processing and visualization capabilities, including newly developed data reduction schemes, database management capabilities, automation, and user-defined development in Python. This workshop will provide hands-on experience with basic to advanced data processing methods in Iolite 4, and an open forum for discussion of specific topics.

W04 - Ore Microscopy, Leaders: Simon Kocher (skocher@mines.edu), Tobias Fusswinkel (tobias.fusswinkel@emr.rwth-aachen.de), **Sponsor**: SGA, **Duration**: 2 days, pre-meeting, 23-24 May. **Students** $100 + HST, Professionals $350 + HST, **Maximum**: 25 participants, including lunches, coffee/tea/snack breaks, and digital course notes.

Reflected light microscopy and detailed ore petrography can shed light on ore deposit formation and often yield crucial information for mineral processing. This 2-day workshop is aimed at economic geologists and mineral processing engineers seeking to refresh and improve their ore microscopy skills. Participants will learn to identify key minerals and textural relationships by examining a series of samples representative of various deposit types.

W05 - Orogenic Gold Deposits, Leaders: Jochen Kolb (jochen.kolb@kit.edu), Georges Beaudoin (beaudoin@ggl.ulaval.ca), Iain Pitcairn (iain.pitcairn@geo.su.se), Nicolas Thébaud (nicolas.thebaud@uwa.edu.au), **Sponsor**: SGA, **Duration**: 1 day, pre-meeting, 23-24 May. **Students** $75 + HST, **Professionals** $345 + HST, **Maximum**: 40 participants, including lunch, coffee/tea/snack breaks, and printed course notes.

This 1-day workshop will feature up-to-date geology, structure, and geochemistry of orogenic gold deposits. It will delve into the origin of hydrothermal fluids from source rock P-T-X-t conditions to gold deposition mechanisms in localized mineralized zones. It will review leading genetic models in relation to important provinces hosting orogenic gold deposits and address atypical and controversial examples.

W06 - Reflectance Spectroscopy for Mineral Exploration, Leaders: Philip Lypaczewski (philip.lypaczewski@cna.nl.ca), Derek Wilton (dwilton@esd.mun.ca), Gary Thompson (gary.thompson@cna.nl.ca), **Sponsor**: CNA, **Duration**: 1 day, post-meeting, 28 May. **Students** $70 + HST, **Professionals** $100 + HST, **Maximum**: 40 participants, including lunch, coffee/tea/snack breaks, and digital course notes.

Reflectance spectroscopy (or hyperspectral imaging) is increasingly being used by exploration companies to understand mineralogical alteration patterns surrounding potential deposits. Fast data acquisition rates and the capability to objectively identify even fine-grained hydrothermal alteration make of these instruments powerful tools for vectoring towards mineralization. This workshop will provide a theoretical introduction to reflectance spectroscopy, case-studies in mineral exploration, and an introduction to the practical use of point instruments (e.g., ASD Terraspec, Halo, or Spectral Evolutions oreXpress) that will be available for the analysis of samples.

Short Course

Short Courses have minimum attendance requirements. If a cancelled for any reason, participants will receive a full refund.

SC01 - Mineral Prospectivity Mapping, **Leader**: Jeff Harris (603jharris@gmail.com), **Sponsor**: MERC, **Duration**: 1 day, post-meeting, 28 May. **Students** $25 + HST, **Professionals** $100 + HST, **Maximum** 40 participants, including lunch, coffee/tea/snack breaks, and printed course notes.

This 1-day course will focus on an introduction to MPM by way of a series of lectures given by experts in the field. Topics covered will include a MPM overview, mineral deposit models, analysis of geochemical data, preparation of predictor maps, machine learning algorithms, uncertainty issues as well as a number of case studies relevant to the Metal Earth Project. The course is ideal for professionals as well as students.

Special Events

SP01 - Listening, Learning, and Respecting Builds Better Relationships with Indigenous Nations, Chair: David Pearson (dpearson@laurentian.ca)**, Open to GAC-MAC-SGA 2023 delegates and the general public. Time/Location**: 1700-1900 Fri 26 May, Indigenous Learning Centre. **Maximum**: 96 participants (registration required).

The well-being of far-north Indigenous communities has not kept pace with southern regions for many reasons, including the inequities of colonization. Some have found themselves located where the geological history favours mineral occurrences that have attracted and are increasingly attracting industrial interest. Listening, learning, and respecting cultural differences and "Two-Eyed Seeing" are essential for the relationships that lead to mutual benefits. This session will share insights into Indigenous perspectives, examples of successful relationship building and what sustainability means beyond the balance sheet. It will be of special value to students and new geological professionals.

SP02 - Women in the Geosciences, Chair: Ken Witherly (ken@condorconsult.com). **Open to GAC-MAC-SGA 2023 delegates and the general public. Time/Location**: 1330-1630 Fri 26 May, WGMC. **Maximum**: 40 participants (registration required).

The Women Geoscientists of Canada organization undertook in late 2021 a survey of their core membership, early career women geoscientists in order to better understand the issues women face in building a career in the field of geoscience. The results of this survey will be reviewed followed by a panel discussion to explore further the major outcomes.

SP03 – Arctic - A Nexus of Resource Development, Climate Change, and Indigenous Wellbeing - Multiple Perspectives, Chairs: Anna Bidgood (anna.bidgood@icrag-centre.org), Brendan Dyck (brendan.dyck@ubc.ca), Philip Rieger (philip.rieger@icrag-centre.org), John Thompson (jfhthompson@gmail.com). **Time/Location**: 1510-1630 Thur 26 May, TBD.

The Arctic is increasingly vulnerable to both changing global climate as well as local disturbances. It also has a long history of mining and considerable potential for further resource development to meet new demand for critical metals. At this special event, we will examine the relationship between mineral systems, specific deposit types, and the amenability of responsible mining in the Arctic. We will discuss the resource potential of the Arctic, particularly in Canada, the characteristics of mineral systems and associated deposits, the likely mining, processing, and waste storage methods of different deposit types, and the resulting positive or negative factors that will influence the environmental and social performance. The discussion will feature Indigenous perspectives and the contribution of Indigenous knowledge. The event will feature some framing talks and a panel discussion.

Social Events

Some of Social Events have minimum attendance requirements. If cancelled for any reason, participants will receive a full refund.

SE01 - Icebreaker Reception at Science North, Wednesday, May 24, 1800-2100. Science North is a multiple award-winning interactive science museum, on the southwestern shore of Ramsey Lake, consisting of an IMAX 3D laser theatre, a digital planetarium, a butterfly gallery, and a wide range of innovative state-of-the-art exhibits. The two stainless steel snowflake-shaped buildings are built on

quartzite of the Mississagi formation, and are connected by a rock tunnel to the Vale Cavern. **Registration**: FREE, **Maximum**: 12 participants, including bus transport from and back to hotels, food stations, first drink (then cash bar), and access to all exhibit floors.
SE02 - Geological Association of Canada Award Luncheon, Thursday, May 25, 1200-1330. GAC members annual luncheon and ceremony for the Logan, Hutchison, Neale and Ambrose medals. **Registration**: $45 + HST, **Maximum**: 100 participants.
SE03 - Mineralogical Association of Canada Award Luncheon, Friday, May 26, 1200-1330. MAC members annual luncheon and ceremony for the Peacock, Hawley, Young Scientist, and Berry medals. Registration: $45 + HST, **Maximum**: 100 participants.
SE04 - GAC Mineral Deposits Division Award Luncheon, Saturday, May 27, 1200-1330. MDD members annual luncheon and ceremony for the Derry, Gross, and Robinson medals. Registration: $45 + HST, **Maximum**: 100 participants.
SE05 - Porketta Bingo, Thursday, May 25, 1800-2100, a Sudbury tradition, at the Beef & Bird Restaurant and Bar. Bingo winners (called every few minutes) win 1 lb of hot, marinated, slow-cooked pork shoulder with warm pagnuttini bread, which is normally shared with those at your table. Pub food available for purchase (see menu). **Registration**: $40 + HST, **Maximum**: 140 participants, including bus transport from LU and back to hotels, entrance fee, one 3-card laminated (reusable) bingo strip (second is $5 more, etc), and first beer ($6 thereafter).
SE06 - Dynamic Earth, Friday, May 26, 1800-2100. Dynamic Earth is an immersive, hands-on science centre featuring Earth science and mining experiences. It includes on-site guided underground tours, multimedia theatres, engaging exhibits, an outdoor science park, and the 9m-diameter "Big Nickel" (the world's largest coin). **Registration**: $75 + HST, **Maximum**: 200 participants, including bus transport from LU, entrance fee to all facilities, food stations, and first drink (then cash bar).
SE07 - Transport to Downtown Dining Venues, Saturday, May 27, 1800. Downtown Sudbury has a range of restaurants and pubs, which are very busy on Saturday nights (as the Stompin' Tom Connors song goes). A list of establishments and road maps will be included in all registration kits. **Registration**: $10 + HST, including bus transport to downtown, one way only, meals and drinks not included.

Accompanying Guest Program

All Guest Events have minimum attendance requirements. If cancelled for any reason, participants will receive a full refund.

Depending on weather and interest, the following activities are planned for accompanying guests. Transportation costs will be nominal; lunches in restaurants are not included. Other activities in Sudbury are listed on Trip Advisor.

G01 - Ramsey Lake Waterfront (winner of a 1992 International *Excellence on the Waterfront* award) separates downtown Sudbury from Laurentian University. Options include a visit to the Sudbury Art Gallery (~1 hr), a walk along the waterfront through Bell Park and along the Bell Park Pathway/Jim Gordon Boardwalk (~45 mins), a visit to the multiple award-winning Science North museum (~1-2 hrs), and possibly a tour of Ramsey Lake on a 70-passenger Cruise Boat (~1 hr). **Duration**: ½ day (afternoon). **Maximum** 12. **Cost**: $15 + HST, including pickup/drop-off at hotel and entrance fee to Art Gallery.

G02 - Killarney Provincial Park is ~1.5 hrs southwest of Sudbury and contains numerous crystal-clear (deep blue on clear days) lakes set amongst white quartzite ridges and glacially-sculpted pink granites and syenites. It is widely regarded as one of the most beautiful parks in Canada and was the subject of several paintings by the *Group of Seven* Canadian landscape artists in the 1920s. There are several options for hikes ranging from short (1 hour) and easy (requiring only sturdy walking shoes) to long (3-4 hours) and moderately strenuous (steep and rocky, requiring sturdy hiking boots), but none are technically difficult. The hike will be followed by afternoon fish and chips in the fishing village of

Killarney. **Duration**: ¾ to 1 day. **Maximum** 12. **Cost**: $50 + HST, including pickup/drop-off at hotel and transport to/from Killarney. Meal in Killarney not included.

G03 - AY Jackson Lookout: Hiking and lunch (*brown bag*) at AY Jackson Lookout in Onaping Falls, 45 km WNW of Sudbury on the rugged North Range of the Sudbury Basin. The 50 m water cascade facing the lookout is the site of the painting "*Spring on the Onaping River*" by Jackson, who was a member of the *Group of Seven*. There are several hiking trails of various lengths and difficulty, an information center, and a self-guided geological tour through a collection of very large samples of Sudbury rocks and ores. **Duration**: ¾ day (mid-morning to mid-afternoon). **Maximum** 12. **Cost**: $25 + HST, including pickup/drop-off at hotel and a box lunch.

G04 - Lake Laurentian Conservation Area: There are many hiking trails in the 950-hectare Lake Laurentian Conservation Area, which surrounds Laurentian University and extends around the south of Lake Ramsey, ranging from short to long, and flat to rugged. Wonderful views of Bennet Lake and Lake Laurentian. **Duration**: ½ day. **Maximum** 9. **Cost**: $5 + HST, including pickup/drop-off at hotel.

G05 - Kivi Park south of Long Lake contains a 55 km network of hiking/biking/ski trails. **Duration**: ½ day (afternoon). **Maximum** 12. **Cost**: $20 + HST, including pickup/drop-off at hotel and park entrance fee.

Transport

Sudbury is ~400 km north of Toronto and ~450 km NW of Ottawa. Depending on your budget and the amount of time you have, there are four travel options:

1) **Air** via Air Canada, Bearskin, Porter, or private plane. Sudbury Airport (YSB) is 30-45 mins NW of town.
2) **Train** via VIArail to/from "Sudbury Junction" on the far east side of New Sudbury (limited services, but functional). At the time of writing, the schedule is limited to:

   Toronto to Sudbury Junction, Sundays and Wednesdays only, departs at 09:55 and arrives at 16:57
   Sudbury Junction to Toronto, Tuesdays and Fridays only, departs at 04:49 and arrives at 14:29
3) **Bus** via Ontario Northland with daily service to/from the bus terminal in New Sudbury.
4) **Private Vehicle** (~4.5 hrs from downtown Toronto, ~5.5 hrs from downtown Ottawa or London, ~6 hrs from downtown Kingston).

A **Shuttle Bus Service** will be operated between some of the South End hotels (Hampton Inn/Homewood Suites, Quality Inn, Super 8, Holiday Inn, Travelodge, Travelway Inn), some of the downtown hotels (Radisson, Northbury), and the Laurentian University campus during the meeting.

Parking

Registered participants may park at no cost in Parking Lot 1 (P1) in front of the Fraser Auditorium Building during the meeting (24-27 May).

Downtown Sudbury and all Pay-and-Display lots on the LU campus use the HotSpot parking app.

Accommodation

Laurentian University is located ~4 km southeast of downtown Sudbury. Blocks of rooms have been reserved at several local hotels, some of which are located fairly near the university, some of which are a bit further but closer to the "Four Corners" commercial area, and some of which are located in downtown Sudbury. All of the hotels listed on the website and registration page have private bathrooms, most serve continental or hot breakfasts and/or have adjacent coffee shops/restaurants, and some have indoor swimming pools. The block booking rates will honoured until **24 April 2023**.

100 spaces have been reserved in campus Residences. The cost will be of the order of $40 + HST per person for double occupancy with shared bathrooms. *Registration will be available on the* meeting website *in April.*

NOTE: Sudbury hosts many large sporting events during the summer, so participants should make sure that they book their accommodation as early as possible.

Internet and E-Mail Access

Free wireless access to the internet is available in all buildings on the LU campus. Most hotels also provide wired and/or wireless access to the internet, but visitors should verify this with their hotel before booking.

Medical

Health Sciences North is a major regional teaching-medical hospital with an emergency room within 5 minutes of Laurentian University. Visitors should assume that they will have to pay all medical costs immediately and should be properly insured. Temporary medical insurance can normally be arranged through your airline company at a reasonable cost. Most pharmacies are open 7 days a week, but only between 09:00 am and 11:00 pm.

COVID-19 and other Respiratory Diseases

Laurentian University presently has no requirement for COVID-19 vaccination but encourages face coverings when distances ≥2m cannot be maintained. This policy is subject to revision if there are changes in recommendations from Ontario Health and/or LU policy.
If you are sick, stay home to prevent transmission to others, perform a self-assessment, and seek testing or medical care if required. Remain home until all of the following apply to you:

- Your symptoms have been improving for at least 24 hours (or 48 hours if you had nausea, vomiting and/or diarrhea)
- You do not have a fever
- You do not develop any additional symptoms

When your symptoms are improving and you are no longer isolating at home, doing the following can provide extra protection against the spread of COVID-19 and other respiratory viruses. For 10 days after your symptoms started:

- Wear a well-fitted mask in all public settings
- Avoid non-essential activities where you need to take off your mask (e.g., dining out)
- Avoid non-essential visits to anyone who is immunocompromised or may be at higher risk of illness (e.g., seniors)
- Avoid non-essential visits to highest risk settings in the community such as hospitals and long-term care homes

Weather

The days in Northern Ontario in late May are moderately long with the sun rising at ~05:40 am and setting at ~09:00 pm. Temperatures range between 9°C and 18°C and are rarely below 3°C or above 25°C. Sudbury is one of the sunniest cities in Canada, but afternoon thunderstorms are common in the summer. A rain jacket and hat are recommended for those attending field trips or hikes, and a light umbrella is recommended for those staying on campus or in town. Attendees should also bring sunscreen (SPF 30 or greater) and reapply it often if they plan to spend more than very short periods outdoors.

Travel Visas

Citizens from some countries and territories require visas in order to enter Canada as visitors. and additional information regarding visas can be found on http://www.cic.gc.ca/english/visit/index.asp. Visitors are required to make their own visa arrangements. We can provide a Letter of Invitation for Presenters if required.

Electrical System

Canada operates on the same 120V 60 Hz AC electrical system as the United States. Grounded outlets require a plug with two parallel flat blades and a cylindrical pin; ungrounded outlets require a plug with two parallel flat blades. Many laptop computers and some phone chargers operate with only an adapter, some hotels provide dual-voltage outlets for shavers, and some hotels provide hair dryers, but visitors should check with their hotels before arrival to determine which appliances will need adapters and/or transformers.

Please contact us at Sudbury2023@laurentian.ca if you have any questions about anything.

We are looking forward to seeing you in Sudbury,

Sudbury 2023 GAC-MAC-SGA Local Organizing Committee

The Laurentian University Campus with Lake Ramsey and Bethel Lake in the background, the Idlewylde Golf Club and Lake Nephawin in the left foreground, Bennett Lake and part of the Lake Laurentian Conservation Area to the right.

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