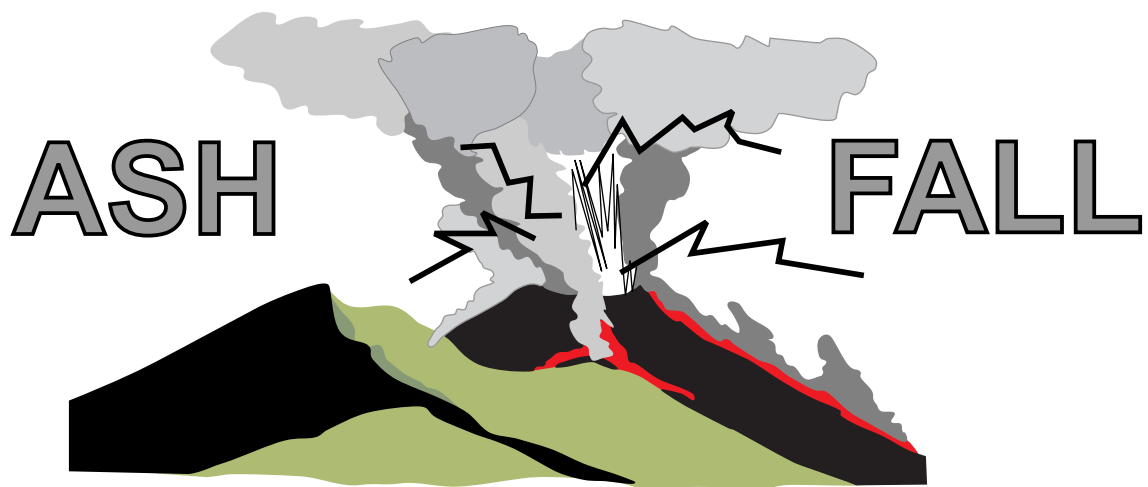




*Newsletter of the Volcanology and Igneous Petrology Division
Geological Association of Canada*

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**2025-2026 VIP
Executive**

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A message from the VIP Chair

A Happy New Year to you all!

Following my appointment to the role of President of the Volcanology and Igneous Petrology (VIP) division of the Geological Association of Canada at our June 2025 annual general meeting, this first year has flown on by. Just after my appointment, I was appointed an Associate Dean, and between these demanding roles my efforts for VIP have been greatly assisted through the diligent work of our VIP board, whom receive my deepest appreciation. I sincerely thank the tireless efforts for VIP performed by our Secretary/Treasurer Zsuzsanna Magyarosi. I would also like to thank attendees at our AGM, and all of you who have helped to support our efforts, be this in field trips, offering sessions at various meetings, contributions to our excellent newsletter-Ashfall-and more. Thanks are given to our outgoing chair, Donnelly Archibald, outreach coordinator, Zeinab Azadbakht, and incoming vice-president, Marie-Claude Williamson, and indeed all members of the VIP board (Eric Yang, Pierre-Simon Ross, Fazilat Yousefi, Kiersty Malay and Pete Hollings). I much appreciate the time and efforts of our regional councillors and others with award adjudication, and also to Dave Lentz who continues to advocate for and promote VIP activities across Canada and beyond. Before I forget, the VIP is looking for a volunteer to fill the position of outreach coordinator, please get in touch if this is something of interest.

This past year saw VIP sponsoring a session at the successful GAC MAC IAH-CNC meeting in 11-14th May 2025, entitled “Geoscience Beyond Boundaries” at the University of Ottawa, where Fazilat Yousefi and I co-chaired a full program of presentations in honour of the seminal contributions of Joseph Whalen to the petrogenesis of anorogenic magmatism and related mineralisation. There were also many wonderful sessions at this meeting that highlight the importance of our field to understanding the Earth and our planetary neighbours, as well as igneous activities responsible for the generation

of economic mineralisation, not just those “critical minerals” that make the daily news! As was provided by us in promotional support to other sessions of the GAC MAC meeting, if you have a volcanology or igneous petrology/petrogenesis related session you would like us to share or promote please get in touch.

This year's GAC MAC meeting “From shore to core” (<https://gac.ca/events/gac-mac-annual-meeting/>) will be returning to St. John's, Newfoundland and Labrador. There are many sessions that I believe will be of interest to VIP members.

Later in this issue VIP shares information on our 2025 award-winners, and we invite you to submit nominations for consideration of these awards in 2026: the Career Achievement Award, and the Gold, Silver and Bronze Gélinas medals.

In closing, I welcome new and continuing members of our volcanology and igneous petrology division and indeed GAC. I invite you to contribute to future Ashfall and GAC newsletters and to help spread the word about this GAC division. Hope to see you in St John's, or at our virtual AGM in May/June.

All the best for 2026.

Ian Coulson (2025-27 VIP President)



Career Achievement Award

The Volcanology and Igneous Petrology Division of the Geological Association of Canada in recognition of career achievements in the field of volcanology and/or igneous petrology present the Career Achievement Award.

Dr. Robert F. Martin for his lifetime scientific contribution to the fields of Volcanology and Igneous Petrology



Nomination Letter

It is with both great pleasure and immense honour that we nominate a long time mentor and friend of the nominees, Professor Robert (Bob) F. Martin, emeritus at McGill University, for the 2025 Career Achievement Award from the Volcanology and Igneous Petrology (VIP) Division of the Geological Association of Canada (GAC). Highlights of Bob's long career include outstanding contributions to the field of mineralogy (particularly feldspar, amphibole, and apatite), crystallography, and the geochemistry and petrogenesis of granitic pegmatites and various alkaline systems. He is well known both in Canada and abroad for his very innovative ideas that span a wide spectrum of fields in Igneous Petrology, particularly alkaline rocks and pegmatites. Among these important contributions include his appreciation that elemental

nuances and enrichment in felsic pegmatites can be intimately associated with their tectonic setting, and his understanding of a wide variety of minerals relevant not only to petrology per se but also to ore deposit studies and the environment. However, Professor Martin is perhaps most synonymous with pegmatites and unravelling their petrological evolution based on numerous and varied studies detailing their settings, petrology, textures and chemistry. All of this and more was evident in his keynote address in the GAC-VIP Special Session in honour of the career of Dr. Joseph Whalen at the GAC-MAC Ottawa 2025 meeting.

In addition to his many research contributions, Professor Martin is also very well known amongst the international scientific committee for his 23 years as Editor of The Canadian Mineralogist, particularly for his meticulous edits (or 'Martinizing'), which dramatically improved most manuscripts, and for his life-long efforts mentoring young scientists and fostering international collaborations.

Professor Martin holds a Ph.D. in Geology from Stanford University, a M.Sc. in Geochemistry from The Pennsylvania State University, and a B.Sc. (Hons.) in Geology from the University of Ottawa. He has been at the Department of Earth and Planetary Sciences, McGill University, since 1970, where he is currently an Emeritus Professor. During his time at McGill, he supervised 20 M.Sc. and nine Ph.D. students.

Professor Martin has and continues to be a prolific producer of high-quality science that is summarized in 186 papers published in the most respected and impactful scientific journals, including Journal of Petrology, American Mineralogist, Ore Geology Reviews, Mineralogical Magazine, The Canadian Journal of Mineralogy and Petrology (formerly known as The Canadian Mineralogist), Lithos, Mineralogy and Petrology, European Journal of Mineralogy, Precambrian Research, and Geochimica et Cosmochimica Acta. These papers have over 4,000 citations and are a reflection of the collective impact of his work. Professor Martin is probably best known for his dedication to the Mineralogical Association of Canada (MAC) and his many societal contributions such as his role in the Special Publications series of the MAC, for which he edited 10, authored 4, and solicited and organized even more. All volumes are beautifully

illustrated and are highly sought after references for mineralogy and geoscience research in Canada and internationally. Professor Martin was also responsible for editing 28 Thematic Issues of The Canadian Mineralogist, seminal collections summarizing landmark contributions in the geosciences.

Professor Martin was awarded the J. Willard Ambrose Medal from the GAC in 2007, the Berry Medal of the MAC in 2001, and the Distinguished Public Service Medal of Mineralogical Society of America in 2004 for recognition of his distinguished public service. Additionally, the new mineral species 'martinite', a complex chloro-borosilicate of calcium, was named after Professor Martin. The latest honour in recognition of his work into the understanding of granitic pegmatites, was dedicating the 10th International Symposium on Granitic Pegmatites (PEG2024) to his career alongside a forthcoming Thematic Volume in The Canadian Journal of Mineralogy and Petrology from contributions of PEG2024.

Mineralogy, crystallography, and the geochemistry and petrogenesis of granitic pegmatites and alkaline systems have been shaped and advanced in no small part by Professor Martin's contributions, not only through fundamental research, but also through his extensive service to our academic community. We believe, without reservation, that Professor Martin's career is worthy of recognition with the 2025 Career Achievement Award from the Volcanology and Igneous Petrology Division of the Geological Association of Canada. Furthermore, the enthusiastic and heartfelt support letters we obtained for this nomination speak loudly of the impact Professor Martin had in so many careers and how very widely respected and admired he is for his generosity with time, support, editing and mentorship.

On a personal note, and alluded to above, we all have very fond memories of interacting with Professor Martin, but the fondest ones are his encouraging notes of pursuing our research. He is also remembered by his radical cutting-edge research communications, as he always had an appreciation of the long history of earth sciences and the breadth and depth of the controversies.

Your sincerely,

Tania Martins (Manitoba Geological Survey)

Daniel Kontak (Laurentian University)

Lee Groat (University of British Columbia)

David Lentz (University of New Brunswick)

Acceptance Letter

It is with a sense of awe, deep humility and gratitude that I accept the Career Achievement award of the Geological Association of Canada in the fields of Volcanology and Igneous Petrology. I thank Tânia Martins, Daniel Kontak, Lee Groat and David Lentz for their kind words in nominating me, and Caterina de Vito, Ferdinando Bosi and Abdel-Fattah M. Abdel-Rahman for their flattering words in support of my candidacy.

It is appropriate to review the contributions of my mentors who prepared me for a career-long involvement in Volcanology and Igneous Petrology. My involvement in the Earth Sciences began at the University of Ottawa. I graduated in 1963, one of four in the second graduating class of the fledgling department. I wrote an undergraduate thesis on the mineralized Nigadoo porphyry near Bathurst, New Brunswick under the joint guidance of Robert W. Boyle of the Geological Survey of Canada and Myron G. Best, recently graduated (1961) from the University of California at Berkeley. Dr. Best taught me igneous and metamorphic petrology, and later in his career published a main-line textbook in those fields. My mineralogy professor, Donald D. Hogarth, also a recent graduate (1959, McGill University), exerted a lasting influence on my professional interests. He introduced me to carbonatites, their fenitic aureoles, and to euhedral crystals of diopside and fluorapatite found in orange calcite in the Gatineau Hills north of Ottawa that have become a focus of my current research.

My interest in the mineralogy and petrology of felsic igneous rocks led me to "shoot for the top". I was accepted to attend the Pennsylvania State University, my number one choice. My advisors there were Mackenzie L. Keith, who had worked on the Blue Mountain (Ontario) nepheline syenite and at the Geophysical Laboratory in Washington with fellow Canadian Norman L. Bowen, and Orville Frank Tuttle, whose association with Bowen and insight into granitic systems were already legendary. At Penn State, I dealt with other superstars, like Wayne Burnham (hydrothermal geochemistry), Rustum Roy (crystal chemistry), Peter Wyllie (igneous and metamorphic petrology) and Joseph Greig, of greigite fame. Little did I realize that the course work in phase equilibria was preparing me for the next stage of my career. My M.Sc. thesis on the granitic batholiths of New Brunswick (1966) provided the context of my early ruminations on magmatism and tectonic setting.

I chose to move to Stanford University when Frank Tuttle accepted a position there. I tackled a thesis in experimental mineralogy, on the controls of the Al-Si

ordering reaction in sodic and potassic feldspars. It was a wonderful topic, very satisfying with albite, but frustrating with K-feldspar owing to the extreme sluggishness of the ordering reaction. As Dr. Tuttle's health deteriorated, Richard H. Jahns stepped in as my main advisor and taught me all about granitic pegmatites. Wayne Burnham happened to be in town the day of my Ph.D. defense, and was invited to join the fray to grill me. After a successful defense in 1968, I remained at Stanford to map the alkali feldspar solvus with peralkaline bulk compositions and to investigate element mobility along a thermal gradient at crustal pressures. My budding expertise in phase equilibria in silicate systems led to an offer of a position with Corning Glass at their headquarters in Corning, New York. I chose McGill University and a much lower salary for the opportunity to remain firmly focused on the Earth Sciences and in Canada. I never regretted my decision to join the faculty of an excellent research-oriented university in 1970.

I met another significant influence in my career when I arrived at McGill. Gabrielle Donnay also joined the staff in the Fall of 1970. She was a superstar in the field of structural crystallography and had amazing insight in the crystal chemistry of minerals. I also interacted with her husband, Jose D.H. Donnay, "fellow by matrimony" and editor of editors. He helped me with difficult cases in my early days as editor of *The Canadian Mineralogist* (from 1978 on). In my role as editor, I helped authors publish results of cutting-edge research in volcanology and igneous petrology, among a host of other subdisciplines in the Earth Sciences.

At the end of my career, I am very grateful for the generosity of my superstar mentors along the way, and for the patience and understanding of colleagues and students at McGill. One would think that I would want to stop thinking creatively about the next topics of inquiry, now that many of the stresses associated with a career in teaching and research have dissipated. I am still having lots of fun writing articles and collaborating with others, in particular Dirk Schumann and Andrei Barkov. Believe it or not, there are still pots that need to be stirred! In the area of editing, I will soon prepare the second edition of "Mont Saint-Hilaire: History, Geology, Mineralogy" by László Horváth, Robert Gault, Elsa Pfenninger-Horváth and Glenn Poirier. After that one is out, I will tidy up a project that has long been on the back burner: "Minerals with a Canadian Connection". I thank Vicki Loschiavo for her unwavering support in everything I do.

I am very grateful to the Geological Association of Canada for the VIP medal.

Robert F. Martin (McGill University)

Ph.D. Award, Dr. Corin Jorgenson
Université de Genève



Nomination Letter

I am writing to strongly recommend Dr. Corin Jorgenson for the Léopold Gélinas Medal in my quality of supervisor of her doctoral studies. I know Miss Jorgenson since 2018 when after completing her bachelor studies (with honours) at Dalhousie University in Canada she moved to Geneva to complete her master studies at the Ecole lémanique des sciences de la Terre, a joint master program of the University of Geneva and the University of Lausanne (Switzerland). After teaching Corin, I was also supervising her master thesis.

After a couple of months that Dr Corin Jorgenson had started her master studies, it was already clear that with her motivation, intuition, and solid background knowledge of the Earth Sciences, she would be a perfect candidate to start a doctorate. Thus, when I was awarded the Swiss National Science Foundation grant "Quantifying the thermo-chemical evolution of magma reservoirs using mineral chemistry: a combined experimental and statistical approach", I immediately offered her a PhD position. This was several months before the end of her master studies. Before starting her doctoral studies she was awarded the best master

student oral presentation award at the Swiss Geoscience meeting in Fribourg (2019) and she received the best master thesis award of the Swiss Geological Society in 2020, after having completed her master with the maximum mark of 6.

The research program developed within the framework of the doctoral studies of Dr. Corin Jorgenson targeted the understanding of the processes responsible for the explosivity of the mafic and alkaline magmas erupted at Colli Albani. Such low viscosity magmas are more typically erupted effusively, however, at Colli Albani, 7 documented caldera forming eruptions were responsible for the emplacement of mafic alkaline ignimbrites. Therefore, this volcano is an emblematic example to define the sequence of events responsible for explosive eruption of mafic magmas. The research developed by Dr. Jorgenson generated innovative approaches, improved our understanding of the processes responsible for the last caldera forming eruption produced by this volcano (Villa Senni ignimbrite), and provided insights to generalise the findings obtained for Colli Albani to other explosive eruptions of mafic magmas. Dr. Jorgenson combined machine learning approaches, mineral chemistry, and synchrotron based experiments to gather insights into the processes responsible for the explosive activity at Colli Albani. All methods however, can be applied to a wide variety of volcanic systems, which significantly increases the value of the research presented in the thesis.

The thesis is structured in 7 chapters of which 4 contain the main results, which are framed by an initial introduction and a general discussion and conclusions chapter where all results of the thesis are discussed together to provide a coherent picture of the broader implications of the research carried out by Dr. Corin Jorgenson. One appendix at the end of the thesis provides details on specific aspects of the supervised machine learning approach developed during the doctoral studies (Chapter 2), additional information on thermobarometry and geochemical modelling presented in Chapter 3, 3D renderings of the data collected at the DESY synchrotron (Chapter 4), additional data on melt inclusions (presented in Chapter 5), data collected on the H content of clinopyroxene, which are now being prepared for publication in a scientific article format, were not included in the thesis as a chapter. Finally, the thesis contains an article co-authored by Dr. Jorgenson which

is now published in *Computer and Geosciences* (Agreda Lopez et al., 2024).

A key publication that should be highlighted is Jorgenson et al. (2024) published in *Contribution to Mineralogy and Petrology*. In this publication Dr. Jorgenson not only led the research and the acquisition of data collected using a wide variety of techniques, but demonstrated her capacity to link datasets into a coherent model unveiling the main mechanisms responsible for the highly explosive eruptions of low viscosity magma, generally feeding low intensity effusive eruptions. This article is the central chapter of the thesis and it was shaped during Corin's doctoral studies with lots of creativity and independent thinking. It was extremely rewarding to see Corin connecting fieldwork, volcanology, petrography, and geochemistry to come up with a solid interpretation and providing an alternative model for the processes leading to large explosive eruptions of this active volcano located in the near vicinity of the city of Rome (Italy). The proximity to Rome also stimulated Dr. Corin Jorgenson to think about the implications of her work to the assessment of volcanic hazard. To this end, she identified the quantification of the duration of magma ascent and accumulation at shallow depth, which the Jorgenson et al. (2024) paper suggested could be as short as years, as a key element to further develop. She established a collaboration with the University of Bern to measure hydrogen in clinopyroxene crystals and use the resulting profiles to quantify these timescales. The results are extremely interesting and are being prepared for publication.

Another part of the thesis that is worth mentioning is the Chapter presenting the 2022 article in *Journal of Geophysical Research* (Jorgenson et al., 2022), presenting a thorough analyses of the performance and hyperparameter tuning of the machine learning thermobarometry model we have been working on in the last few years. This article has been already cited 70 times and for me is the perfect reward for the hard work of Corin that spearheaded this research investing a significant amount of time to truly understand the functioning of the machine learning algorithms we use. In my opinion the thesis of Dr. Corin Jorgenson fulfils all criteria for the prestigious Léopold Gélinais Medals as it

addresses with originality the issue of highly explosive eruptions of low viscosity magmas, something that has been discussed for over 30 years, using carefully collected data and applying innovative synchrotron-based techniques and machine learning approaches. The thesis is extremely well organised and all datasets are well introduced and nicely linked by a general discussion chapter that demonstrated the scientific maturity of Dr Jorgenson.

I cannot think of a more deserving candidate for the Léopold Gélinas Medal. Dr. Corin Jorgenson is an extremely talented young scientists with exceptional creativity and motivation that is capable of elevating research well beyond the state of the art, while being engaged with the community and transmitting her passion to students with teaching and outreach activities. I was extremely lucky that Dr. Corin Jorgenson chose the ELSTE program for her studies and me as a PhD supervisor. She left an indelible mark in the research group I lead because of her excellence and capacity to work in a group for the good of science and knowledge.

I hope you will be able to consider Dr. Corin Jorgenson for this prestigious award.

Your sincerely,
Luca Caricchi

Acceptance letter

I'm honoured and exceptionally happy to be the 2025 recipient of the Léopold Gélinas Gold Medal for my Ph.D. research. I would like to give a heartfelt thank you to the Volcanology and Igneous Petrology Division of the Geological Association of Canada for selecting my thesis for this award.

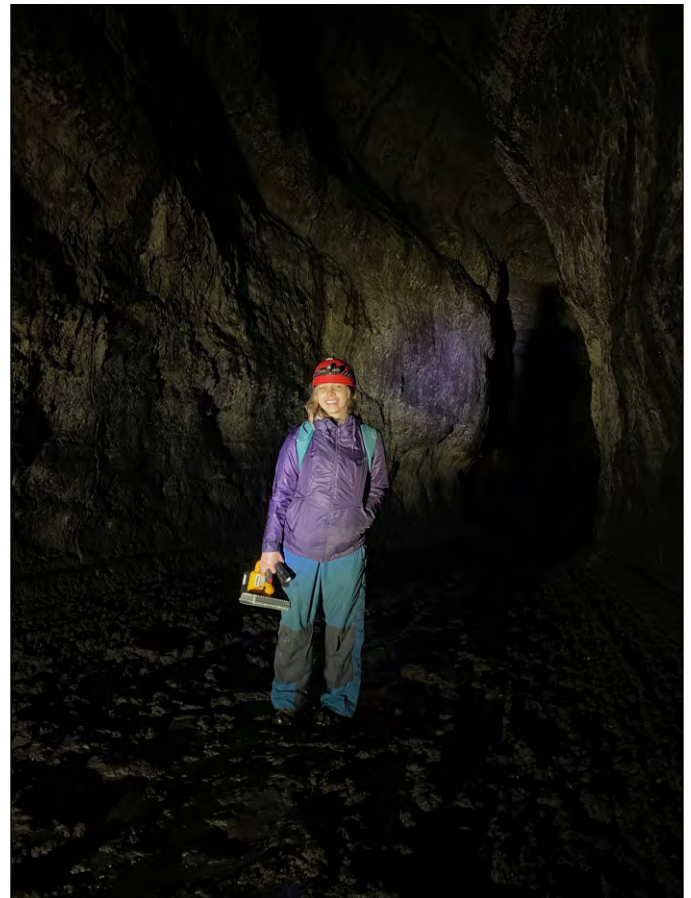
I would like to especially thank Prof. Luca Caricchi, who has been my mentor and guide during the Ph.D. (and M.Sc). Luca's steady enthusiasm for volcanoes and research is inspiring. I'm lucky and grateful to have been his student. Thank you to all my scientific collaborators, especially to Guido Giordano, the MAGE group at UNIGE (past and present), the folks at DESY, Maurizio and Monica (UniPG), Anne-Sophie (SwissSIMS), and Nils (UNIBE). I would also like to give my thanks to the Swiss National Science Foundation for funding this research and these four beautiful years of my life. I'm also exceptionally grateful and thankful to all my friends and family who supported me throughout this

journey. And finally, thank you to this beautiful and mysterious earth, I'm ever thankful to bear witness to the majesty of volcanoes.

Thank you again to GAC-VIP for this distinction,

Dr. Corin Jorgenson

M.Sc. Award
Sarai Montañez Muñoz
Simon Fraser University



Nomination Letter

I would like to nominate my former M.Sc. student, Sarai Montañez Muñoz, for the 2025 Léopold Gélinas Silver Medal. Sarai's thesis (completed in just over two years in Apr 2024) is entitled "Gravity modeling of Lunar lava tubes: Insights from Ape Cave as a terrestrial analogue" and blended geomorphological analysis and geophysics to explore techniques for lunar exploration. With a very strong background in Geological engineering and a passion for planetary geology and volcanology, Sarai jumped at the opportunity to apply geophysics to the characterisation of lunar lava tubes. Specifically, as part of a larger Canadian Space Agency project, she collaborated with a multi-institutional team of engineers and seismologists (SFU, Manitoba, McGill, Polytechnique) in the development and testing

of novel miniature gravimeters and seismometers for eventual deployment on the Moon. Her M.Sc. project focused on characterising the required instrumental sensitivity and likely gravity anomalies expected for the detection of lunar lava tubes as ideal sites for eventual lunar habitation (e.g., protection from meteorite impacts and cosmic radiation).

Over the course of two field campaigns on the Ape Cave lava tube (Basalt Flow, Mt. St. Helens, WA, USA), Sarai integrated detailed high-resolution 3D LiDAR imaging (6 mm over 3.4 km) with gravity field surveys and forward modelling to fully characterise the lava tube – to the best of our knowledge this is the most extensive high resolution survey of any lava tube globally. With this data in hand, her first manuscript "Morphometric analysis of Ape Cave lava tube: A realistic and complex terrestrial analogue for lunar exploration" (In review with Geomorphology) applied statistical clustering algorithms to ~1400 cross-sections in order to quantitatively characterise the important geometric variation and complexity in terrestrial lava tubes, which in the planetary geology literature are commonly modelled as simple pipes. Her second manuscript "Gravity modeling of lunar lava tubes: Insights from a terrestrial analogue" (recently submitted to Journal of Geophysical Research – Planets) built on this work by constructing and validating forward gravity models that incorporated realistic density and geometric parameters of terrestrial and lunar conditions. This work shows that even with low-sensitivity sensors, relatively small lunar lava tubes which are typically substantially larger than terrestrial analogues, would be readily detectable on the Moon.

Sarai is following a professional career path which continues to straddle disciplines, and most recently started with Ideon Technologies in support of Muon imaging for the mineral exploration and mining sector. She is a humble yet enthusiastic young geoscientist with the breadth of interests, abilities, and passion to contribute significantly to our field. It is thus without any reservation that I most strongly recommend Sarai for the GAC-VIP Léopold Gélinas Silver Medal.

Sincerely,
Glyn Williams-Jones

Acceptance letter

I am truly honoured and grateful to receive the Gélinas Silver Medal for my master's thesis — this recognition means so much to me.

I would like to sincerely thank my supervisor, Dr. Glyn Williams-Jones, and my committee member, Dr.

Nathan Hayward, for their invaluable guidance and support throughout my research journey. I am also thankful for the financial support provided through the Canadian Space Agency LEAP Planetary Science Investigation Grant to Dr. B. Bahreyni and Dr. G. Williams, which made this work possible.

I'm deeply grateful to my friends in the Physical Volcanology Research Group at Simon Fraser University for creating such a supportive and inspiring environment. I want to thank my mom, who has been a constant source of strength, love, and encouragement every step of the way.

Thank you once again to GAC-VIP for this incredible privilege. I am excited to carry this recognition with me as I continue my work in geoscience.

Warm regards,
Sarai Montañez Muñoz

B.Sc. Award
Maria O'Neill
Memorial University of
Newfoundland



Nomination Letter

I am honoured to nominate Maria O'Neill's BSc Honours thesis for the Volcanology and Igneous

Petrology bronze medal for the best BSc thesis in 2024-2025. She was supervised by me (Dr. Donnelly Archibald and Dr. Greg Dunning (Memorial University Newfoundland). The title of her thesis is "Age, petrogenesis, and tectonic significance of the Top Pond pluton, southern Newfoundland". Maria's research focused on an unstudied diorite to tonalite pluton in southern Newfoundland named the Top Pond pluton. The pluton resides in an important location in that it is proximal to a major shear zone, undated granitic plutons, and recently discovered lithium and cesium mineralization. However, at the beginning of her project, we knew very little about the overall significance of the intrusion. Maria collected her own field, petrographic and mineral chemistry data. Her whole-rock geochemistry and geochronological data were provided but she worked hard to understand the methodologies of these provided data. Maria spent a lot of time learning the different data collection methods and interpreting her data. For an undergraduate thesis, Maria should be commended for the volume and diversity of data that she incorporated into her thesis. The important outcomes of her thesis were the identification of magmatic epidote and paragonitic amphibole that indicate the Top Pond pluton was emplaced at high pressure. In addition, the geochronological data showed that the pluton is the oldest in this part of southern Newfoundland and that it could represent basement to the overlying Dolman Cove formation, the metasedimentary and metavolcanic unit that hosts the lithium- and cesium-bearing rocks. Her data and interpretations also enhanced geological correlations between southern Newfoundland and Cape Breton Island in Nova Scotia. Her work will be written up for publication over the next few months.

Maria was very enthusiastic about her research. She presented her results at the Atlantic Universities Geoscience Conference (AUGC) hosted at Dalhousie in October, the Atlantic Geoscience Society Colloquium in Dartmouth in February, and the GAC-NL meeting in St. John's in February. Maria recently accepted an offer to begin M.Sc. thesis research to understand the isotopic and P-T conditions of pegmatite emplacement in the Canadian Appalachians.

Kind regards,
Donnelly Archibald

Acceptance letter

I am extremely honoured to be awarded the Leopold Gélinas Bronze Medal for my B.Sc. thesis and would like to extend my sincere thanks to the GAC Volcanology and Igneous Petrology Division for selecting my work for this award. This project was made possible through the direct support of my supervisors, Dr. Gregory Dunning at Memorial University of Newfoundland and Dr. Donnelly Archibald at St. Francis Xavier University. I would also like to thank Dr. Steve Denyszyn, as well as all of the faculty and staff in the MUN Department of Earth Sciences and the CREAT Network, who played a role in making this project happen. I am endlessly grateful for the opportunity to have worked with such knowledgeable, skilled, and supportive people throughout the completion of this thesis.

Maria O'Neill

Here is a photo of the winner of our B.Sc. Award Winner form 2024, Mia Morson, with her medal:



The IAVCEI 2025 Scientific Assembly Geneva, Switzerland



The IAVCEI 2025 Scientific Assembly was held in Geneva, Switzerland, from June 29 to July 4, 2025. IAVCEI stands for the International Association of Volcanology and Chemistry of the Earth's Interior. The IAVCEI mission statement is:

1. To advance volcano-related research and tackle community and global challenges through inclusivity across different cultures, disciplines, identities, and perspectives
2. To promote the study of volcanic and magmatic processes, disseminate research findings, and facilitate discussions through dedicated events
3. To stimulate inclusive cooperation, support volcano surveillance, reduce volcanic risk, and be the international reference body for science policies
4. To foster collaboration, respect, and equity of practices contributing to a sustainable and resilient future for all

The Bulletin of Volcanology is the official journal of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI).

Compared with previous meetings, the 2025 IAVCEI Scientific Assembly embraced a broader scope on '**The Energies of Magma: From Volcanic Eruptions and Mineral Resources to Geothermal Production and Sustainability**'. Themes 1, 4 and 5, for example, were included in the scientific program as a result of the

global focus on renewable energy and critical minerals.

Theme 1: Production of magma and assembly of volcanic plumbing systems

Theme 2: Pre- and syn-eruptive monitoring

Theme 3: Volcanic processes

Theme 4: Minerals for the energy transition

Theme 5: Geothermal systems and carbon storage

Theme 6: Hazard, Risk and Impact

Theme 7: Communication in Volcanology

Theme 8: The future of volcanology, a bundle of sessions organized by the ECRs (Early Career Researchers) of IAVCEI

The next IAVCEI Scientific Assembly will be held July 1-6, 2029, in San José, Costa Rica.

Check out the IAVCEI website for future meetings and workshops, and please reach out if you have any questions!

Marie-Claude Williamson (GSC Ottawa, marie-claude.williamson@nrcan-rncan.gc.ca) – **Yannick Le Moigne** (GSC Vancouver, yannick.lemoigne@nrcan-rncan.gc.ca)



The booth set up by Italy's National Institute of Geophysics and Volcanology (INGV).

2025 EMP Conference Field Trip: Geological and Critical Mineral Insights from the Pokiok Plutonic Suite, New Brunswick

As part of the 2025 Exploration and Mining Professionals (EMP) Conference, the Geological Survey of New Brunswick (GSNB) organized a one-day field trip to the Pokiok area of west-central New Brunswick on October 26, 2025. The excursion was led by Dr. Ayalew Gebru, Dr. Amirabbas Karbalaeiramezanali, and Mr. William Gilmore from the GSNB. The trip, attended by 41 participants, highlighted recent work from the project Evaluation and Characterization of the Mineralizing Systems within the Western and Northern Pokiok Plutonic Suite, which focuses on understanding the geological evolution and critical mineral potential of this important magmatic system. Participants included geology enthusiasts, GSNB staff, university researchers, industry geologists, and students.

The field trip provided a comprehensive overview of the Pokiok Plutonic Suite—an Early Devonian composite batholith that hosts a variety of critical metal mineralization styles, including Sb–(W–Mo–Be) and Cu–Zn–Pb–Ag–(Au). The group departed from Fredericton early in the morning and visited several key geological sites between Lake George and Zealand Station before returning in the late afternoon (Figure 1).

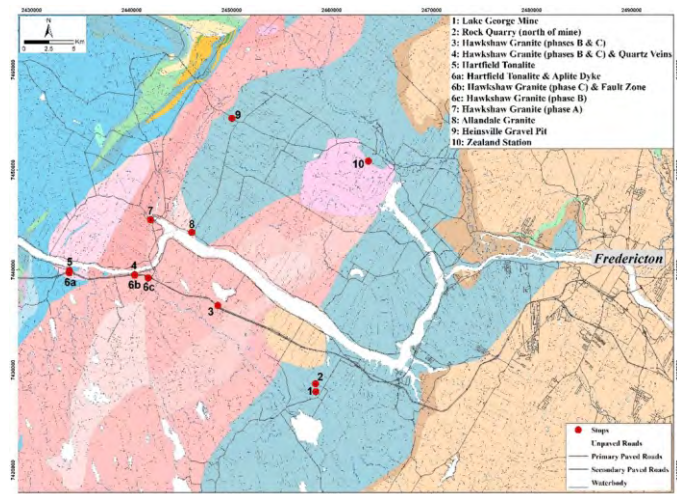


Figure 1: Map showing the locations of Stops 1 through 10 on the Pokiok Plutonic Suite field trip.

The first stop was the historic Lake George antimony mine (Figure 2), one of New Brunswick's most significant former producers of antimony, with associated tungsten, molybdenum, and gold mineralization. Participants examined stibnite- and

molybdenite-mineralized quartz–(carbonate) veins, diamond drill core from hornfelsed metasedimentary rocks of the Burtt's Corner Formation, and the intrusive Lake George Granodiorite, which is interpreted as the causative intrusion. The mine provided an excellent example of a reduced intrusion-related polymetallic system, where Sb is the dominant commodity and W and Mo represent important secondary targets. At this location, Niyayesh Khorshidi, a Ph.D. student at the University of New Brunswick, gave a short presentation outlining her research on the geochemical, environmental, mineralogical, and reprocessing potential characteristics of the Lake George deposit.



Figure 2: At the Lake George Historic Mine, Dr. Ayalew Gebru is describing the geology of the Pokiok region and the recently recognized phases on the geophysical map to the attendees.

The next stop was a nearby gravel quarry at Lake George, where participants examined molybdenite- and scheelite-bearing quartz veins hosted in diopside-bearing skarn developed within the hornfelsed Burtt's Corner Formation. The mineral assemblage and structural features suggest a close genetic relationship with the Lake George intrusion, highlighting the broader W–Mo potential of the area.

Continuing north toward Highway 2, the group examined several outcrops of the Hawkshaw Granite, one of the principal components of the Pokiok Plutonic Suite. Two distinct textural and compositional phases were observed: a grey megacrystic variety and a coarse-grained pink granite (Figure 3), both crosscut by pegmatitic and aplitic dykes. Quartz veining and chlorite–epidote alteration were noted along fault-controlled zones. These stops

illustrated the multiphase nature of the Hawkshaw Granite, and the late-stage fluid activity associated with faulting.



Figure 3: Hawkshaw Granite phases B (gray) and C (pink) at Stop 3.

At Temple Road, participants examined a fault-controlled alteration zone within tonalitic to granodioritic rocks. The strongly hematitized zone returned values of 9 g/t Ag and 86 ppb Au from previous sampling, emphasizing the structural control on fluid flow and mineralization in this part of the batholith. Farther west along the highway, additional stops showcased leucocratic aplitic dykes cutting the Hartfield Tonalite and clay- and chlorite-altered fault zones in the Hawkshaw Granite, possibly related to the Magaguadavic Fault system (stops 6a and 6b respectively). Station 4, which was skipped due to time constraints, represents the northward extension of this fault and hosts a quartz vein containing chalcopyrite and malachite, assaying 1400 ppm Cu.

After a lunch break near the World's Largest Axe in Nackawic, the group continued north toward the more evolved phases of the batholith. At Campbell Settlement Road, fine-grained pink granite of the early Hawkshaw phase was examined, followed by a visit to Upper Queensbury, where the Allandale Granite is exposed. This granite is light-colored, coarse-grained, and contains abundant quartz, alkali feldspar, and muscovite, reflecting its highly evolved, peraluminous nature. Its geochemical composition suggests potential fertility for Be–Sn–Nb–Ta mineralization.

The next stop at Hainesville Quarry provided a striking example of greisenized Fe–Mn-bearing sandstones of the Burtts Corner Formation, crosscut by granitic apophyses dated to approximately 400 Ma. This site

demonstrated clear evidence of fluid–rock interaction and late-stage hydrothermal alteration associated with the Pokiok intrusions. The greisen alteration and elevated Fe–Mn content mark this zone as a potential indicator for concealed W–Mo–Be systems.

The final stop was at the Zealand Station beryl occurrence, where participants observed greisen zones developed within the Hawkshaw Granite, hosting coarse-grained beryl crystals and numerous quartz veinlets (Figure 4). Several granitic and aplitic lithologies were exposed, including light pink granite, white granite and a northwest-trending aplitic dyke. The site provided an excellent opportunity to discuss the evolution of Be mineralization in reduced peraluminous granites and the relationship between magmatic differentiation, volatile enrichment, and greisenization. The Zealand Station occurrence represents the northern extension of critical metal fertility within the Pokiok Plutonic Suite.



Figure 4: Beryl mineralization at Zealand Station.

Throughout the day, the field trip emphasized the close association between magmatic evolution, deformation, and hydrothermal activity in controlling mineralization across the Pokiok region. The combination of field observations, geochemical data, and geochronological evidence indicates that the Hartfield–Hawkshaw–Allandale sequence records progressive magmatic differentiation from metaluminous tonalite to highly evolved peraluminous granite between 407 and 400 Ma. Late-stage aplitic and leucogranitic intrusions, accompanied by hydrothermal fluid circulation, generated diverse mineralization styles ranging from Sb–W veins to Be-bearing greisens.

This excursion successfully illustrated how recent mapping and analytical work by the Geological Survey of New Brunswick continues to refine the

understanding of critical mineral systems in the Appalachian domain of western New Brunswick. The Pokiok area remains an important focus for ongoing geological and geochemical investigations aimed at evaluating its potential for intrusion-related mineralization.

Acknowledgment

Special thanks to Mr. Serge Allard, Ms. Erin Smith and Dr. Katheline Thorne from the Geological Survey of New Brunswick (GSNB) for their invaluable support and assistance in organizing and conducting this field trip.

Submitted by:

Ayalew Gebru (Geological Survey of New Brunswick)

Geochronology and Petrogenesis of Granitoids Associated with the Porphyry–Low-Sulfidation Epithermal System in the Woodstock Area

The Geological Survey of New Brunswick (GSNB) is conducting a project to evaluate the potential for porphyry and low-sulfidation epithermal mineral systems in the Woodstock area of west-central New Brunswick. The project consists of two main components: the first, initiated in 2024, focuses on mineral prospectivity mapping to identify areas favorable for porphyry–low-sulfidation epithermal systems; the second, which began in the summer of 2025, aims to understand the magmatic and hydrothermal evolution of Silurian–Devonian intrusive complexes and their role in the formation of base- and precious-metal mineralization. The objectives of the second component are to re-evaluate the geochronology of key intrusions in the Woodstock area including the Connell Mountain Tonalite, Gibson Granodiorite, Benton Granite, and smaller stocks at Churchill, Bulls Creek, and Grafton to better constrain the regional magmatic history and its relationship to mineralization. Petrological, lithogeochemical, and isotopic analyses (U–Pb zircon dating, Sr–Nd and oxygen isotopes, and whole-rock geochemistry) will be conducted to characterize magma sources, evolution, and fertility. Thin-section and SEM–EDS studies will further document mineralogy and alteration assemblages. Integration of these datasets will enhance metallogenic models and improve

understanding of the exploration potential for porphyry–low-sulfidation epithermal mineral systems in western New Brunswick.

The Woodstock area lies in the southwestern Miramichi Zone that is dominated by Cambro-Ordovician sedimentary and volcanic rocks, intruded by several Ordovician granitic bodies. These include the Connell Mountain tonalite (474 ± 1 – 4 Ma), Gibson granodiorite (473 ± 1 Ma), and Benton granite (467 ± 2 Ma), along with three granitoids of uncertain age: Churchill, Bulls Creek, and Grafton (Figure1).

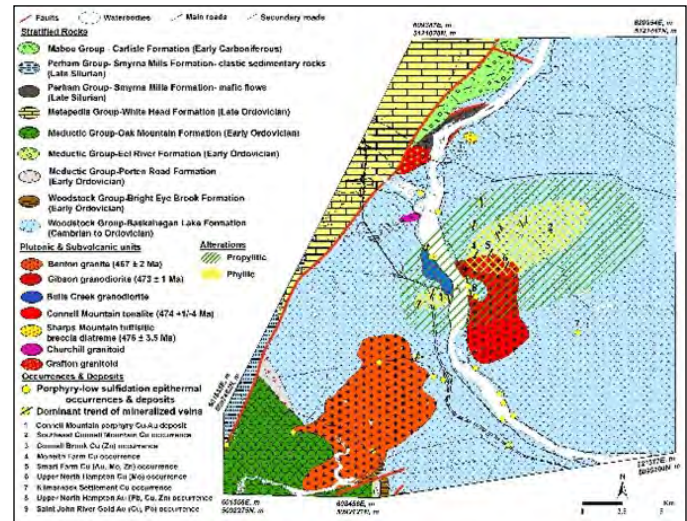


Figure 1. Bedrock geology map of the Woodstock area and its porphyry-low sulfidation occurrences and deposits.

The Sharps Mountain tuffisitic breccia diatreme (Figure 2) is a fine grained, intermediate tuffisitic breccia with abundant fragments, reflecting explosive subvolcanic activity. Minor manganese mineralization has been observed, and its spatial and compositional association with the Gibson intrusive suite and Connell Mountain porphyry system indicates potential for porphyry-style $\text{Cu} \pm \text{Au}$ mineralization. Geochemically, its composition is similar to the Gibson intrusion, though somewhat altered, and it is expected to display low high-field-strength element contents and adakitic affinities. The Connell Mountain Stock is a high-level, hornblende–plagioclase porphyritic tonalite cupola located approximately 1.5 km north of the main Gibson Pluton and hosts low-grade porphyry copper mineralization, estimated at 23 Mt grading 0.18% Cu. The stock is predominantly porphyritic tonalite with minor porphyritic granodiorite, containing 50–60% phenocrysts in tonalite and 20–25% in granodiorite. Phenocrysts include plagioclase, quartz, and hornblende, and the unit exhibits weak propylitic

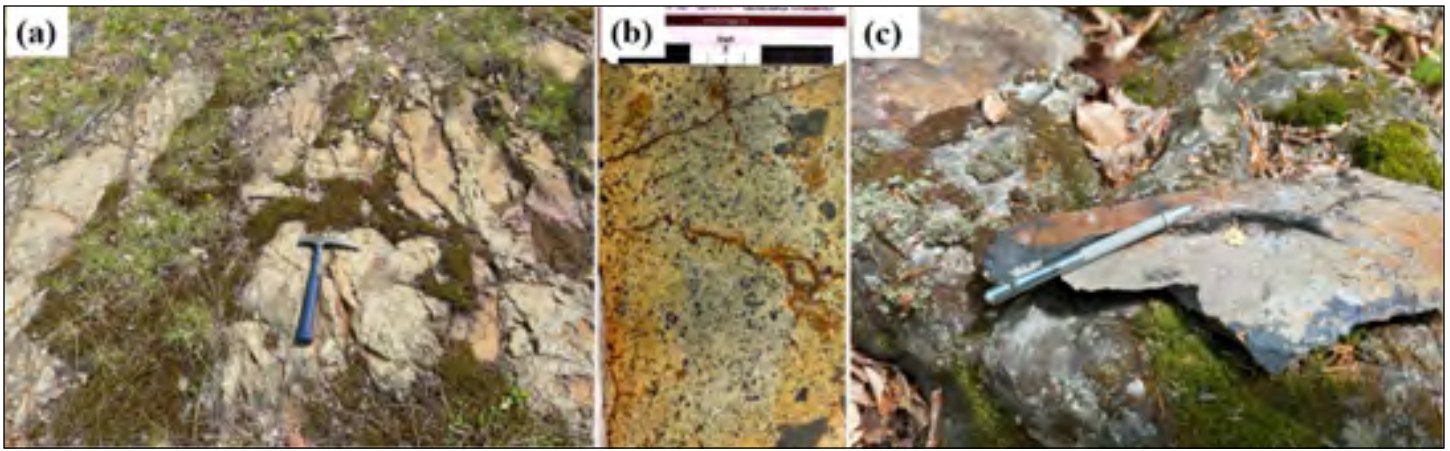


Figure 2: a) Outcrop of the Sharps Mountain tuffisitic breccia diatreme, b) polished slab of a representative sample from the diatreme, c) Mn mineralization within the Sharps Mountain diatreme

alteration. Texturally, the tonalite is medium- to coarse-grained with a groundmass of 0.08–0.10 mm, while granodiorite has a finer groundmass of <0.04 mm. Geochemically, the tonalite contains MgO 3.9 wt.%, total Fe₂O₃ 5.8 wt.%, CaO 5.1 wt.%, Na₂O 2.75 wt.%, and K₂O 0.93 wt.%, is metaluminous (A/CNK 0.73–0.97), calcic, and magnesian. High-field-strength elements are low (TiO₂ 0.16–0.38 wt.%, Zr 67–92 ppm, Nb ~5 ppm), with Zr/Y of 7–11 and Nb/Y of 0.6–0.9, indicating I-type, magnesian, calc-alkaline, slab-failure adakitic affinities.

The Gibson Pluton is predominantly tonalitic with local granodioritic compositions. It is medium-grained, equigranular, and consists of approximately 40–45% plagioclase, 30–35% quartz, 15–20% hornblende, minor K-feldspar, and trace sulphides. Mineralization is primarily porphyry-style Cu ± Au, notably associated with the Connell Mountain stock. Geochemically, the pluton exhibits MgO contents of 1.9–3.9%, total Fe₂O₃ of 4.4–6.4%, and low high-field-strength elements (TiO₂ 0.16–0.38 wt.%, Zr 67–92 ppm, Nb ~5 ppm), with Zr/Y ratios of 7–11 and Nb/Y ratios of 0.6–0.9, reflecting I-type, magnesian, calc-alkaline, and adakitic signatures.

The Benton Pluton comprises two coeval intrusive components. The Caldwell Brook quartz monzonite is medium-grained, equigranular, and typically grey to mottled light pink and greyish green, while the Dugan Road monzogranite is generally pink, medium-grained, and equigranular, with locally fine-grained and porphyritic varieties featuring partially saussuritized plagioclase phenocrysts. Hydrothermal alteration is widespread throughout the pluton, including chloritization and epidotization, accompanied by abundant quartz–epidote veins. Mineralization includes pyrite associated with silica veins and minor manganese minerals. Geochemical data are currently

being collected.

The Grafton Stock is composed of fine-grained quartz monzonite and displays notable iron-oxide and hydrothermal alteration (Figure 3). Mineralization within the stock includes pyrite associated with silica veins, along with minor occurrences of manganese minerals. Geochemical data are presently being collected and analyzed to further characterize its composition and potential economic significance.

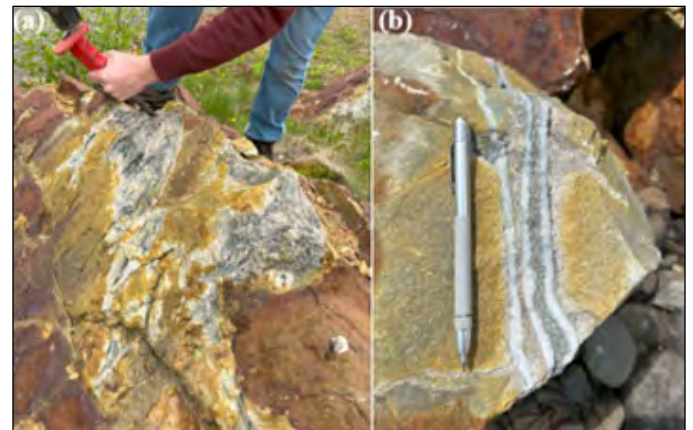


Figure 3. (a) Altered fine-grained quartz monzonite from the Grafton Stock showing iron-oxide and hydrothermal alteration, and (b) pyrite associated with silica veins.

The Bulls Creek Stock, characterized by a medium-grained, equigranular to seriate texture. Its mineral composition includes approximately 40% plagioclase, 35% quartz, 15% hornblende, and 10% K-feldspar, closely resembling the porphyritic granodiorite of Connell Mountain in both mineral assemblage and chemical trends. Mineralization appears in sulphide–quartz–carbonate veins and breccias, hosting copper and gold, exemplified by a copper-rich chip sample containing 1200 ppb Au, and is accompanied by an As–W–Bi association indicative of hydrothermal activity. Geochemical analyses are currently in progress

to further assess its characteristics.

Together, the granitoid intrusions of the Woodstock area, from the larger plutons to the smaller satellite stocks, reveal a dynamic magmatic and hydrothermal system that has played a key role in local base- and precious-metal mineralization. Continued geochronological, petrological, and geochemical studies, along with ongoing characterization of alteration and mineralization, will provide a more complete understanding of the magmatic evolution and metallogenic potential of the region. These integrated datasets not only illuminate the geological history of the Woodstock area but also serve as a valuable foundation for guiding future exploration efforts.

Acknowledgment

The authors thank David R. Lentz (UNB) and Ayalew Gebru (GSNB) for their valuable comments and guidance, and Kathleen G. Thorne (GSNB) and Serge Allard (GSNB) for their ongoing support throughout this project. We also acknowledge Alex M. Welles (UNB) for assistance during fieldwork, which greatly contributed to the success of this study.

Submitted by:

Amirabbas Karbalaieiramezanali (Geological Survey of New Brunswick); Fazilat Yousefi (University of New Brunswick)

Late tectonic rare-metal pegmatitic magmatism in the Bancroft area, SW Grenville Province



Figure 1: Group picture of the team visiting the Bancroft area.

On May 15–16, we participated in a field trip to the Bancroft area of southwestern Ontario as part of the GAC–MAC conference held in Ottawa. The trip was organized and led by David Lentz (University of New Brunswick). Its objective was to provide researchers and pegmatite enthusiasts with an opportunity to examine the complexity of late Grenvillian pegmatite magmatism in the Bancroft region (Figure 1), a locality long regarded as a paradise for mineral collectors.

Geological Setting

The Bancroft pegmatites are spatially associated with late-tectonic granite, syenite and nepheline syenite intrusions enriched in Mo, U–Th, and REE–Y (REY) (Lentz, 1991a, 1991b, 1996). Historically, these pegmatites were mined for ceramics (K-feldspar and quartz), abrasives (corundum), uranium (Madawaska and Greyhawk uranium mines; Lentz, 1991a, 1991b, 1996), and molybdenum (Moss Molybdenite mine; Lentz & Creaser, 2005). Although formerly described as abyssal-type pegmatites, they are now classified as NYF (Niobium–Yttrium–Fluorine) pegmatites. Most bodies exhibit features transitional between the abyssal and muscovite classes, whereas only a minority display the attributes characteristic of rare-metal pegmatites.

Within the Grenville Province uraniferous pegmatites occur throughout the Grenville of Canada and New York state (Figure 2), including eastern Ontario and western Quebec (Figure 3). The pegmatites are variably mineralized, undeformed uraniferous pegmatites (granitic, syenitic, and nepheline syenitic) intruding post-Ottawan compressional structures (Gauthier and Chartrand, 2005), constraining the youngest deformation to approximately 1060–1000 Ma (Figure 2). Pegmatite emplacement coincided with orogenic collapse, exploiting structural pathways within a cooling orogen, particularly along brittle metagabbro intrusions.

Dating uraniferous pegmatites is challenging due to the metamictization of many phases, including zircon. Lentz and McFarlane (2025) applied U–Pb titanite geochronology to a pegmatite from a large endoskarn at the MacDonald Feldspar mine, yielding an age of 1022 ± 4 Ma. Fowler and Doig (1983) obtained considerably younger whole-rock Rb–Sr errorchrons; more detailed Rb–Sr dating may provide improved age constraints. Re–Os dating of molybdenite has produced ages of 1069 ± 11 Ma for the Hunt Mo pegmatitic granite-skarn (Lentz & Suzuki, 2000) and 1053 ± 4 Ma for the Moss Molybdenite pegmatite (Lentz & Creaser, 2005).

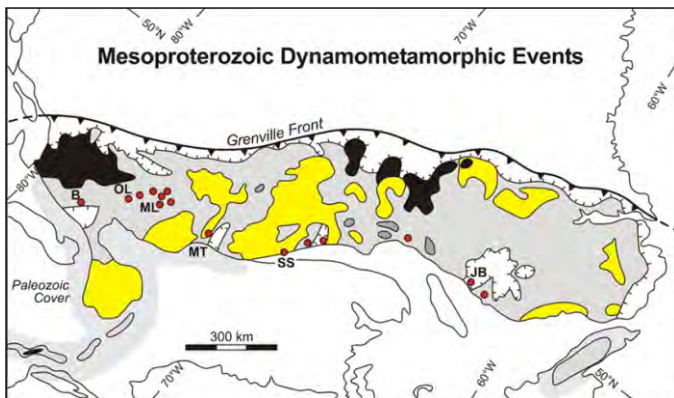


Figure 2: Geological map of the Grenville Province showing the various metamorphic facies; greenschist–lower amphibolite (ticked areas), amphibolite (medium gray), upper amphibolite–granulite (yellow), eclogitic (black) with key radioactive pegmatite fields (red dots) in the Bancroft (B), Otter Lake (OL), Mont Laurier (ML), Mont Tremblant (MT), St. Siméon (SS), and Johan Beetz (JB) areas (see Gauthier and Chartrand, 2005).

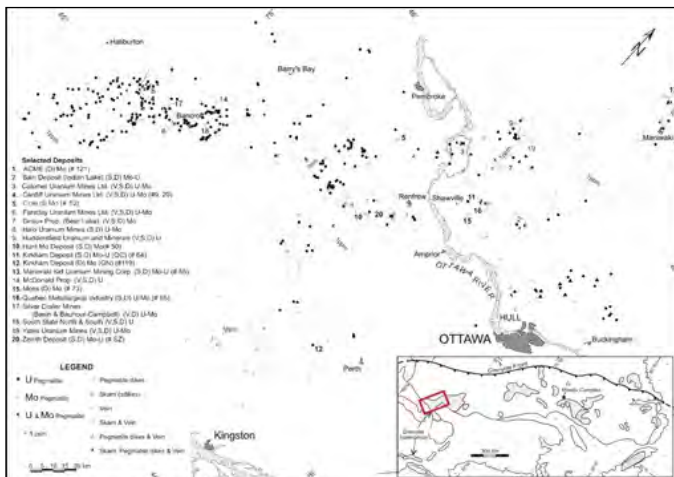


Figure 3: Location of selected Mo-bearing and (or) U-bearing pegmatites, skarns, and vein-dykes (numbered) in the southwestern Grenville Province of Ontario and Quebec (modified after Lentz, 1991a, b). Note the 1 ppm airborne equivalent Uranium contour compiled from the Geological Survey of Canada database.

To better constrain the source of the pegmatites, Lentz (2007) recalculated initial $^{87}\text{Sr}/^{86}\text{Sr}$ values using Easton's (1986) compilation for Grenvillian gneissic systems between 1050 and 950 Ma, prompted by the low $^{87}\text{Sr}/^{86}\text{Sr}$ ratios obtained from the pegmatites. This work aimed to demonstrate that the pegmatite sources were derived from Grenvillian crust rather than from the mantle. Using whole rock Rb–Sr analysis, Fowler and Doig (1983) similarly reported several initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratios near 0.705. Three calcite samples from pegmatites yielded comparably low $^{87}\text{Sr}/^{86}\text{Sr}$ ratios (0.7041–0.7055), with the exception of a single

anomalous sample (0.7202; Lentz, 1996). Anhydrite from the Madawaska Mine pegmatite also produced a low ratio of 0.704 (Rimsaite, 1982).

Gamma-ray spectrometry indicates that pegmatites, skarns, and vein–dykes in each area have similar eU and eTh contents, suggesting a genetic link among them (Lentz, 1991a, 1991b, 1992a, 1992b, 1998). Lentz (1996) proposed that selective decompression partial melting at upper-amphibolite to granulite facies conditions occurred within crust dominated by orthogneissic lithologies and impoverished in supracrustal components. Melt ascent was facilitated by structurally controlled pathways associated with late extensional deformation, transporting magma to higher crustal levels where lower temperatures promoted progressive crystal fractionation and the development of multiple emplacement sites.

The largest dyke swarms occur within metagabbroic rocks, which tend to deform brittly; for example, the Faraday pegmatites (Madawaska U mine) intrude the Faraday metagabbro (Bedell, 1982). Figure 4 illustrates the relationship among post-Ottawan compressional deformation, slow exhumation, uplift and cooling, and the timing of melt generation and injection into the upper crust. Within this framework, the youngest pegmatites intruded rocks that were significantly cooler than their high-grade metamorphic assemblages would imply. Lentz (1996) suggested that selective partial melting, combined with variable degrees of crystal fractionation during magma ascent through cooler crust, promoted the enrichment of rare metals in these highly evolved pegmatitic magmas.

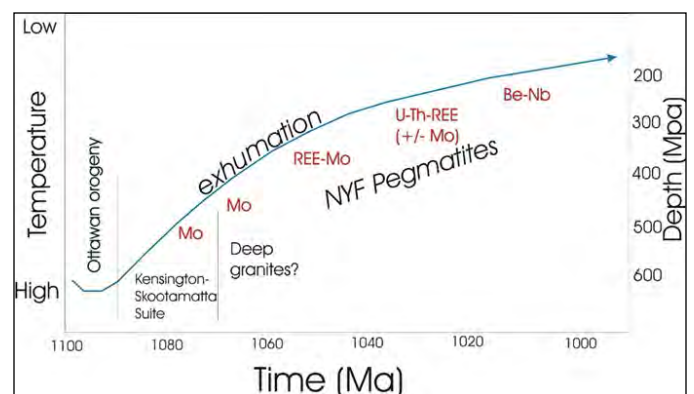


Figure 4: Pressure–Temperature diagram showing exhumation of Grenville rocks with fertile granitic pegmatites emplaced over time during orogenic collapse after the Ottawa Orogeny. Ages and depths of emplacement are simply estimates.

Field trip

On the first day of the field trip, we visited the Quadeville pegmatites (Figure 5), which host beryl and

rose quartz, followed by stops at the Craigmont corundum pegmatite and the MacDonald REE–Y–Nb–U pegmatite.



Figure 5: Quadeville Be pit sites

The second day focused on several classic roadside outcrops along Highway 28, west of the Madawaska uranium mine area (north) and the Greyhawk uranium mine (south). Stops included the southern Saranac Zr–REE pegmatite, the Goulding–Keene nepheline pegmatite (with associated corundum-bearing nepheline gneisses), and the Princess sodalite pegmatite (Rock Shop), but the Moss Molybdenite mine was missed due to timing (Figure 6). Unfortunately, the type perthite locality south of Perth

is no longer easily accessible. Although these iconic sites are historically significant for mineral collecting and past mining, access has become increasingly limited in recent decades due to changes in land ownership.

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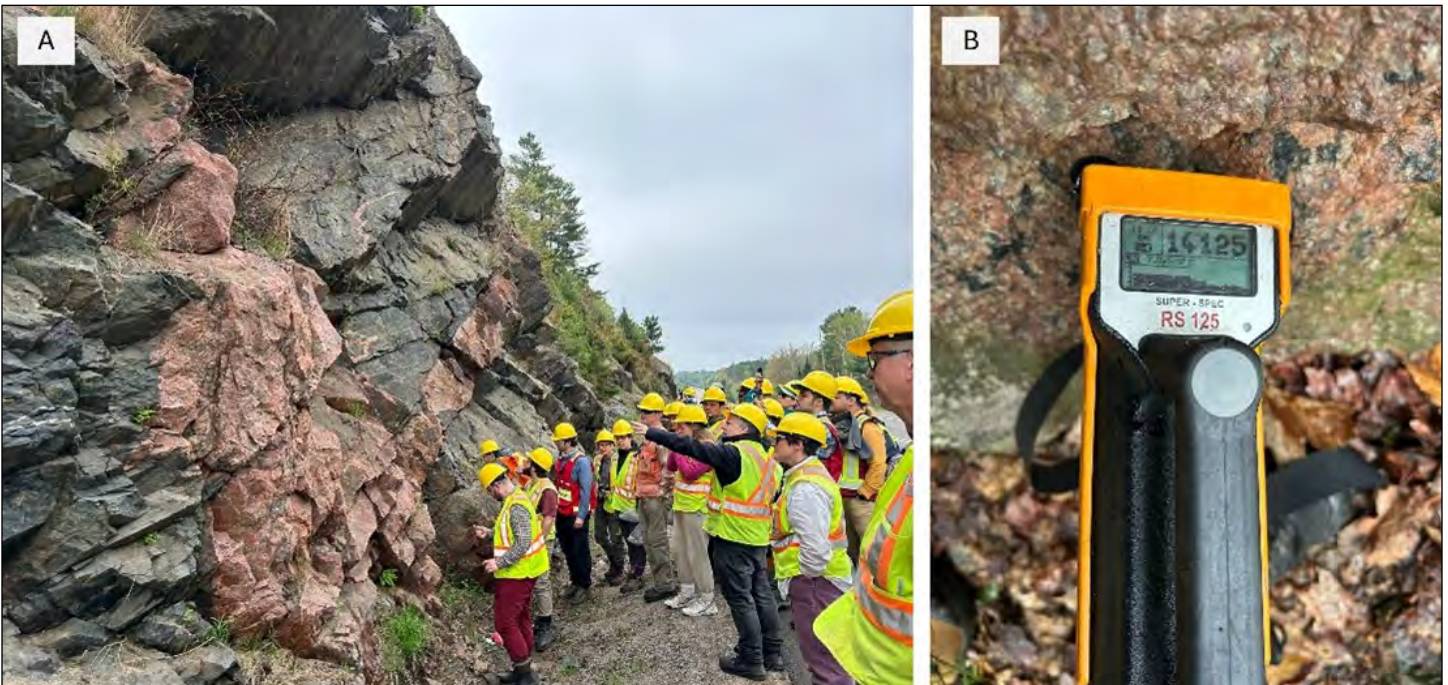


Figure 6: A) Uraniferous pegmatite dyke swarm within the variably deformed Faraday metagabbro, which Bedell (1982) noted was deformed more brittle during the emplacement of the pegmatites. B) High gamma-ray values (e.g., >14000 cps) correspond to elevated concentrations of radioactive elements (e.g., K, eU, eTh) in the Saranac pegmatite.

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Submitted by:

Fazilat Yousefi and David Lentz (University of New Brunswick)

GAC-VIP session, Ottawa, 2025

The GAC-MAC-IAH-CNC 2025 (May 11-14th) conference convened in Ottawa in 2025, featuring a notable special session (GAC-VIP Session) titled "Petrogenesis of Anorogenic Magmatism and Related Mineralization: Decoding Magmatic to Geodynamic Processes." This session honored the significant impact of Joe Whalen's research in advancing our understanding of granitoid magmatism complexities, including anorogenic processes. Whalen's pioneering investigations into granitoid geochemistry and the tectonic contexts of magmatic systems have profoundly enriched our knowledge of compositional evolution and the intricate mineralization mechanisms associated with these rocks. The session highlighted pivotal themes from Whalen's career, exploring granitoid differentiation mechanisms, the temporal role of anorogenic magmatism, and its implications for critical mineral systems. By integrating petrogenetic insights with mineralization patterns, Joe Whalen's contributions continue to shape our comprehension of Earth's magmatic history.

We are delighted that this session to Joe Whalen took place alongside so many experts and geologists.

Co-chairs: **Ian Coulson** (University of Regina) & **Fazilat Yousefi** (University of New Brunswick)



Obituary for Donald Wilfred Hattie



The GAC community will be saddened to learn that Donald Wilfrid Hattie, 85, passed away on May 30, 2025. Don was a member and supporter of the Geological Association of Canada (1974-2025) and the Volcanology and Igneous Petrology Division. He enthusiastically attended the annual Atlantic Geoscience Society meetings. A passionate field geologist, he worked across Canada and is also remembered for his contributions to geological education at public and professional levels.

Donald attended Mt. Allison University at age 16 and graduated in 1959 with First Class Honors in Geology. He went on to pursue graduate studies at both Harvard and the University of Western Ontario.

After graduation he did geological mapping for the NB Department of Mines (Upsalquitch Forks map sheet). In the 1960's and 70's he mapped iron deposits in Northern Ontario (Hanna Mining Company), did mineral exploration in the Bathurst Camp, and worked in greenstone belts in the Archean and Proterozoic rocks of the Canadian Shield. Donald teamed up with plane owner and geologist Cam Cheriton, got his pilot's license, and the two carried out reconnaissance mineral exploration in remote, unexplored regions

across Canada. Following graduate studies, Donald worked with various mineral exploration firms including Western Mines (Thelon Basin, Nunavut) and Falconbridge (Wabowden, Manitoba and Sudbury, Ontario).

Don co-founded Geosleuths Mineral Exploration Services with Mark Connell, and carried out consulting and contracting work from the early 1980's until his 'retirement'. Geosleuths did its own exploration and staking, but also did contract work for mining companies, the Department of Natural Resources, the Geological Survey of Canada, and municipalities. Services included water resource investigations, geochemical and geophysical surveys, geological mapping and drilling supervision.

Donald was a geoscience intellectual; his house was a library. Similarly, he had collections of ore suites from many major mines in Canada and the USA. With his extensive experience, depth of knowledge and comprehensive rock and mineral collections, he was well suited to teaching. He delivered prospecting courses with engaging lectures for the New Brunswick Department of Natural Resources. These courses stressed hands on mineral and rock identification, soil and silt sampling techniques, panning, running magnetic and electromagnetic surveys, making field maps, staking claims, cutting picket lines and writing assessment reports. Geosleuths even took the prospecting course to Nunavut. Associated with the courses he produced rock and mineral sets with booklets explaining the nature, origin and significance of each specimen.

Donald was not just a gifted geologist and educator, he was an exceptional outdoorsman, a conscientious environmentalist and strong supporter of human rights. He impacted the lives of many and will be greatly missed.

Acknowledgements:

We thank Kathy Hattie for assistance reviewing the obituary.

Written by **Bev Hattie and John Greenough**

Obituary for Keith Bell 1938-2025



Keith was a northerner, born in Newcastle-on-Tyne, Northumberland, England. He attended the local village school in the small, coal-mining village of Delves Lane in County Durham, not too far away from the gritty, iron and steel town of Consett. After attending the local grammar school, Keith went on to the University of Leeds to study geology, obtained a B.Sc. and from there went to Oxford where he obtained a D.Phil. His time at Oxford, was among the happiest days of his life and there he made lifelong friends. A visiting Fulbright fellow at Oxford invited Keith to take up a post-doctoral position at the University of Texas in Austin where he spent three years. He always liked to comment on the differences between Oxford and Texas which were immense but at the same time interesting. During his stay in Austin, Keith made many visits to Mexico, and claimed that this was one of the most fascinating countries he had visited.

Later Keith spent two years in the Dept. of Physics at the University of Toronto in Canada and from there he went on to take up a permanent position at Carleton University, Ottawa, where he remained until he retired. He was an excellent teacher, and this came through with the students' annual evaluations. During his

university life Keith was active in academia. He was Director of the Ottawa-Carleton Geoscience Centre, a joint research programme between Carleton University and the University of Ottawa. He was also a member of the University Senate, served on countless university and departmental committees, and was at one time president of the Faculty Club. He also was the first chair of the Grievance committee for the faculty union. Keith was appointed Distinguished Research Professor in 2004.

Keith travelled extensively during his career. After Oxford, but before Texas, Keith had a special grant from the British Government to collect samples from some unusual volcanoes in Uganda. Even after his retirement, he was still approached by researchers from different institutions for access to these samples. For most of his career Keith worked on a very unusual group of rocks called carbonatites. In 1989 he edited a book "Carbonatites – Genesis and Evolution" which became the standard work in the field. Later with a colleague J. Keller from the University of Freiburg he co-edited another volume on an unusual volcano Oldoinyo Lengai in Tanzania. Along with Tony Simonetti and Bruce Kjarsgaard he co-edited a volume of the Journal of Petrology dealing solely with carbonatites.

Keith always enjoyed working with others. Throughout his career he worked with Canadian colleagues of the Geological Survey of Canada, the Saskatchewan Geological Survey, the Ontario Geological Survey, the Newfoundland Dept. of Mines and Energy, and the New Brunswick Dept. of Mines.

Keith had an active research group of graduate students and post-doctoral fellows at Carleton. With J. Blenkinsop, they set up the first multicollector mass spectrometer. He was invited as a visitor to Leningrad State University in 1991 and to Complutense University in Madrid in 1989. During his visit to Russia, Keith was one of the first non-Soviet geologists since the revolution to visit the Kola Peninsula, an out-of-bounds, militarily sensitive region in the Russian arctic. In his later years Keith carried out research in Italy, and along with Italian colleagues proposed a controversial model for volcanic activity. Throughout his career Keith reviewed papers for all of the international journals in his field, including Nature. Keith was always very proud of the fact that he co-authored eight papers in Nature. Keith's collection of carbonatites was second to none. Samples were collected by him from Canada, Italy, Kenya, Uganda, Tanzania, Hawaii, Finland, Ukraine, the USA and Russia.

In 1971, Keith married Irena Zajszyj, and they spent 54

happy years together. Irena, of Ukrainian background, worked for many years at the National Library in Ottawa, and produced a Ukrainian radio programme in Ottawa for twenty years. Their quite different personalities complemented one another, and over the years they both did a great deal of travelling.

Throughout his life Keith, even as a small child, was a keen collector, if not stamps then old coins, if not old coins then antiques. Along with his wife, a collection was made over the years of art from young, contemporary Canadian artists. As a child Keith was considered to be a gifted artist, and throughout his scientific career he rented several studios where he continued drawing and painting. In later years he took up block print-making, and participated in several group shows at one of the major galleries in Ottawa. His one-man show of composers, conductors and musicians at the National Arts Centre in Ottawa, he considered to be one of the highlights of his artistic endeavours.

In 2008 a session of the Goldschmidt Conference, one of the most prestigious conferences in his field, was held in his honour in Vancouver, Canada, and this led to a volume of Mineralogy and Petrology in 2010 dedicated to him entitled "Carbonatites, Alkaline Rocks and the Mantle: A Special Issue Dedicated to Keith Bell". In the dedication of this volume one of his former students wrote "He was an excellent mentor and his drive for knowledge and research is relentless, stimulating and infectious".

During the last years of his life, Keith succumbed to an undiagnosed chronic pain condition that hampered his enjoyment of life and severely curtailed his interest in both art and science.

Keith is survived by his wife, Irena, his sister Helen Crozier, and his niece Emma and his nephew Richard along with their families. Keith's passing on November 20 at the Ottawa Hospital, was sad for his wife, his family and all who knew him. It was hoped that his wonderful personality, outstanding intellect, vast knowledge in various fields would remain with us for more years. He was loved, admired and will be missed. On November 20th the world lost an outstanding person.

A full memorial celebration will take place in Spring 2026.

Source:

<https://beechwoodottawa.ca/en/services/keith-bell>

International Geological Congress (IGC) Calgary, August 2028 Call for volunteering

1. IGC Context - Showcase Canadian geosciences and geoscientists

Are you familiar with IGCs? We have been referring to it as the "olympics of the geosciences" because they occur every 4 years, rotate around the globe and have a competitive bidding process.

They are also a once in a generation event as the last one in Canada was 1972 in Montreal (last North American was 1989 in DC), and there has never been one in all of western North America.

2. Scientific program - Igneous Petrology Theme

We are currently in the midst of dividing the scientific program into themes for the first circular (March 2026). These themes will provide the international community with a structure to submit proposed sessions.

We are hoping that you would be interested and willing in being on the Igneous Petrology Theme lead team.

3. Ask for Theme Lead team

The idea with this structure is to greatly reduce the work for everyone. For example for the theme lead team members we ask that you would:

- i) Use your networks to solicit for session submissions
- ii) Vet the related submitted sessions
- iii) Use your networks to solicit for abstracts (opening in June 2027)
- iv) Coordinate abstracts that don't fit into sessions (chair teams with the session submissions will vet the abstracts).

We would also ask that one member from your theme lead team attend the Scientific Program Subcommittee meetings (90 minutes every 3-4 months).

Might you like to chat online in the next couple of weeks? Do you have any questions?

Contact: **Katherine Boggs** (kboggs@mtroyal.ca)

Call for Abstracts on peralkaline systems at GAC-MAC 2026

SS-01 Alkaline to peralkaline intrusive, subvolcanic, and volcanic magma c systems: analysis of sources to mineralizing processes

Convenor(s): David Lentz, Zsuzsanna Magyarosi and Anton Chakhmouradian

This session welcomes contributions on all aspects of alkaline silicate magmatic systems from their source(s), their ascent dynamics, all fractionation processes including extreme fractionation, aspects of emplacement of the intrusions including hypabyssal levels, and extrusive eruption dynamics and products. Aspects of mineralized alkaline to peralkaline silicate systems are also welcome including the role(s) of volatiles and hydrosaline - hydrosilicate melts in various processes.

This Special Session is accompanied by a 2-day pre-meeting Short Course:

SC-02: Mineralogical Association of Canada Short Course on Peralkaline Rocks and Associated Mineral Deposits

Organizer: Anton Chakhmouradian

And a post-meeting 3-day Field Trip:

FT-08: Alkaline and Peralkaline Systems and Associated Mineralization in the Western Avalon Zone

Organizers: Zsuzsanna Magyarosi and David Lentz

Check out the full program online: <https://event.fourwaves.com/stjohns2026/pages>

We look forward to seeing many of you experts in St. John's!

VIP Award Reminders

The Career Achievement Award - the deadline is **15 February 2026**.

Please send nominations to Ian Coulson (Ian.Coulson@uregina.ca)

The Gold Gélinas medal for an outstanding Ph.D. thesis in the fields of volcanology and igneous petrology - the deadline is **28 February 2026**.

The Silver Gélinas medal for an outstanding M.Sc. thesis in the fields of volcanology and igneous petrology - the deadline is **28 February 2026**.

The Bronze Gélinas medal for an outstanding Honours thesis in the fields of volcanology and igneous petrology - the deadline is **15 April 2026**.

Please send nominations for the Gélinas medals to Zsuzsanna Magyarosi (zsuzsannamagyarosi@gov.nl.ca).