Queen's University

DEPARTMENT OF
GEOLOGICAL SCIENCES AND
GEOLOGICAL ENGINEERING

GEONews 2023

Photo by: Dr. Daniel Layton-Matthews

Greetings from the HEAD

Its November in Kingston, the days are short, but when the sun is shining it seems like anything is possible. Like the magnificent gift to the newly named Stephen J. Smith Faculty of Engineering and Applied Science, a gift to spur massive change in engineering education. Like the gift of the class of '82 to honour Bruce Evans, proceeds from which will support the first ever capstone field course for geology students, GEOL 400. Like the gifts from Gord and Katherine Keep to the Azurite Fund that supports summer research positions for undergraduate students. Like the gift by the family of Rob Gordon Sci '85 of eight stunning works of art by Indigenous artists working in the Woodland Genre that are now hanging in the Miller Museum of Geology. These works inspire all of us to think more carefully about Indigenous peoples and their connections to and interactions with the land, and their deeply felt concern for its protection. And, perhaps, to see the land in a different way and to be open to the stories that are in these artworks.

Teachings by J. Laford

A favourite of mine is the "Teachings" by John Laford as it seems to imply how we can think about learning. Not just the "sage on the stage" but from sharing wisdom and knowledge and observations by many. I suspect that the more we study these works, the more we will glean from them.

There is a theme of art this year. One day in September I encountered a team placing the rock sculpture "The Three Observed", on the east lawn of Miller Hall. They had been moved from the front lawn of the Agnes Etherington Art Centre, to make way for the Agnes Reimagined project. The artist, William Vazan told me that the engravings represent the black Constrictor snakes in the Kingston area. Mr. Vazan's art-making takes place in a quarry in the Tamworth area, close enough for a visit! Next time you are in Kingston, do take a look at this sculpture which I think of as the "anchor" of what we hope one day will become a rock garden/ exhibit, and an extension of the Miller Museum of Geology.

For staff and faulty the important “events” in the school year start with field school in August and a welcome to the incoming second year class in the first week of September. This is the beginning of the legendary community that is Queen’s Geological Sciences and Geological Engineering. This year we announced the Winter of 2023 Named TA-ship awards at the event. It was a great way to both welcome these new keen students and to let them know that they have joined an amazing group of thousands of Queen’s GEOs across the world. A cadre of alumni who kindly and generously make donations that reduce the cost of their education. I think it is heartening for them to know that GEO alumni have our backs and have their backs!

A hallmark of a 21st century education is learning how to undertake research, to learn for oneself, to learn to discern the quality of information, the quality of data, and the means by which information and data are collected and curated. Whether they are doing field, laboratory or computer based research, our undergraduate students are undertaking important projects that add to geological knowledge. Matt and Emma (page 9), just two of the summer students funded for summer research, mapped and developed the geological inventory of local trails in the Kingston area. A further 11 students undertook research projects over the summer and were funded partly by a variety of sources – federal and university funding programs, and the internal to the department “Azurite Fund” named for one of my favourite specimens in the Miller Museum. These opportunities for summer employment may lead to conference presentations, papers, and grad school. They help faculty members with their research and help train graduate students to be mentors to these nascent researchers. Know that these experiences can change students’ lives. Rob Harrap writes about his experience doing research as an undergrad back in the 80’s (page 10). I had a similar experience, at about the same time, which led me to Queen’s, and to the best geology department in Canada, in my opinion!

We thank you all for your gifts. The impact is profound – from supporting student learning in the field, the lab and the classroom to learning about research, and how to help tease out a new discovery about the earth, or possibly the moon or Mars. Your gifts enable us to provide students with the best possible education, include multiple opportunities to spend time in the field and to become part of that legendary community that is Queen’s Geological Sciences and Geological Engineering.

Vicki Remenda
Head of Department

Field School 2023
Led by Dr. Jennifer Day and Dr. Christopher Spencer (front row)

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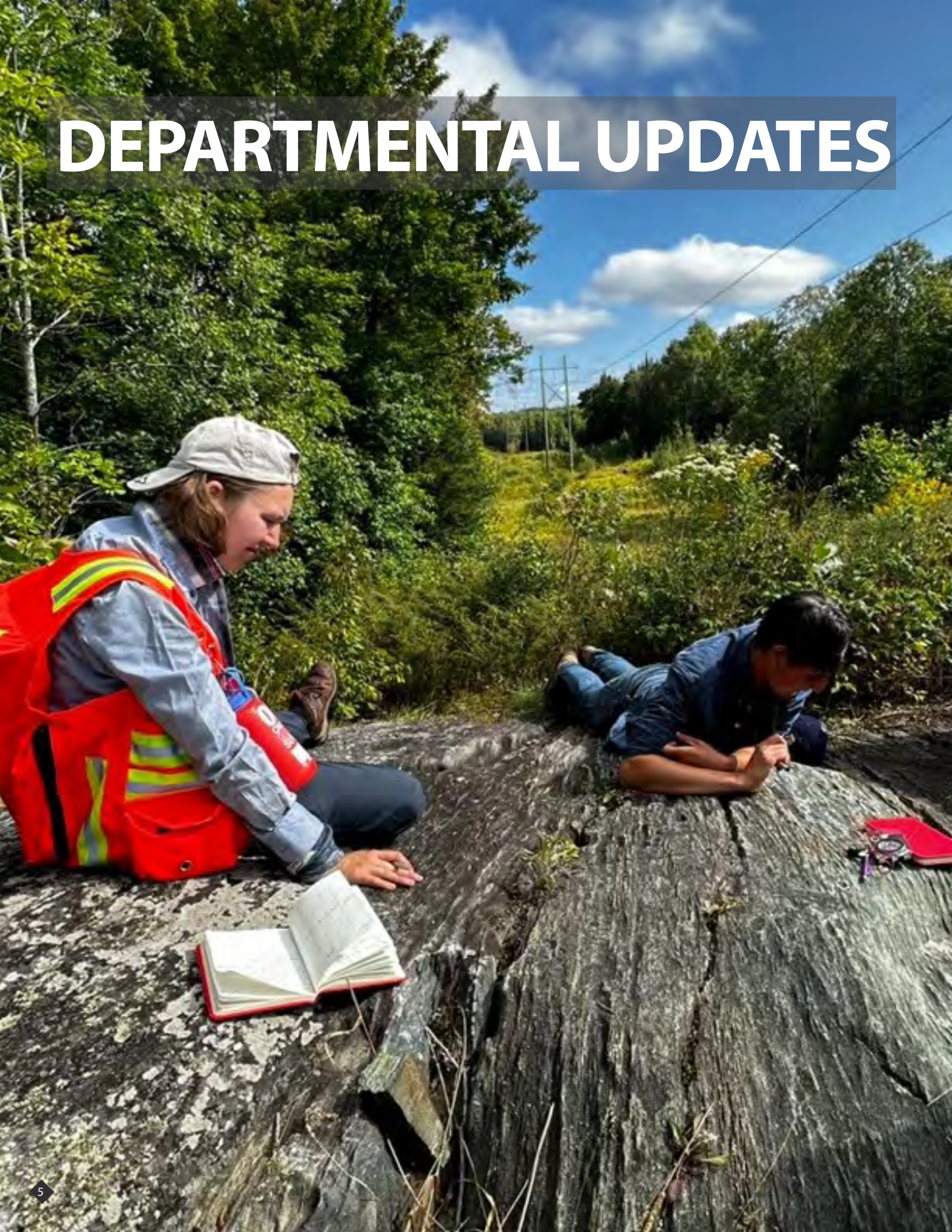
LAND Acknowledgement

Queen's University is situated on Anishinaabe and Haudenosaunee Territory. To acknowledge this territory is to recognize its longer history, one predating the establishment of the earliest European colonies. It is also to acknowledge this territory's significance for the Indigenous peoples who lived, and continue to live, upon it – people whose practices and spiritualities were tied to the land and continue to develop in relationship to the territory and its other inhabitants today. The Kingston Indigenous community continues to reflect the area's Anishinaabek and Haudenosaunee roots. There is also a significant Métis community and there are First Peoples from other Nations across Turtle Island present here today.

DEPARTMENTAL UPDATES



Field School 2023

Left to right: Undergraduate students, Savannah Ford Chloë Letcher, and Isabelle Gravelle in the Bruce Wing, Reading Room

I attended Field School 2023 this past summer in August. Despite reassurances from upper year peers, I was quite nervous about the extremely short time frame of this course, especially as someone with academic accommodations. Of course, my fears were all for naught. This experience was more than I could have hoped for. It's easy to see how our department can become so close through field courses spent together.

We were thrust into the field at the Ore Chimney site on our first day, and it didn't take long to get back into my 'geology brain'. The greater part of the class was fortunate enough to have been able to take GEOL 221 in the fall term of the previous year. While there were higher expectations placed on us, they were realistic, as we had completed almost the exact same tasks to a lesser degree in GEOL 221. After our first day, our exploration and mapping was very much self-guided. I must say, this was probably one of my favourite aspects of the course, and now that the course is completed, has solidified my confidence in my growing geological field skills. GEOL 300 has also given me a sense of what I could do better as I continue with my education. GEOL 300 is very much a groupwork based course, relying heavily on collaboration and communication to complete deliverables. In this sense, GEOL 300 has made me more aware of my shortcomings when it comes to collaborating with others.

However, the best part would have to be the time spent together with peers, TAs, and profs. Every moment was filled with good memories, and I think I speak for everyone when I say that I will not be forgetting the time I had at Ore Chimney anytime soon. I'd also like to give a special thanks to all our lovely TAs, Funmi, Billy, Marc, Taylor, and Emelie, and to our wonderful profs, Dr. Spencer, and Dr. Day, for making this course such a success."

- Chloë Letcher, third year Geological Sciences student

Monitoring for Mercury

David McLagan stands on the volcanic Whakaari (White Island) in New Zealand. He was there measuring Mercury emissions from volcanic sources.

New Assistant Professor in the Faculty of Arts and Science, David McLagan (Department of Geology and School of Environmental Studies), has earned the Governor General's Innovation Award, which celebrates excellence and impact in innovation across all sectors in Canada.

Dr. McLagan and his co-awardees and PhD supervisors from the University of Toronto, Dr. Carl Mitchell and Dr. Frank Wania, received the award for designing a passive sampler for monitoring mercury levels and pollution in the air.

The innovative instrument titled the Mercury Passive Air Sampler (MerPAS) is unique in that it operates without the need for electricity or gas, using natural movements of air (turbulence/wind and diffusion) and a carbon material to capture mercury from air. This is especially important for spatially distributed monitoring mercury around the world and particularly in remote locations where there is less access to electricity.

"That's really the advantage here: accessibility," Dr. McLagan explains. "You need a lot of technical training to run and maintain an active sampler. However, MerPAS can be easily operated by almost anyone with a simple, graphics-based set of instructions. You can leave it out for weeks, months or even years and when you are ready you collect the sampler, close and seal it, then ship it back to whoever is going to analyze it."

Another advantage is MerPAS's affordability, which makes the system obtainable for basically anyone. One MerPAS sampler costs around $100 while active (electrical) sampling instrument costs in the range of $70,000 to $100,000.

"The issue is mercury problems are often felt most in developing countries where widespread mercury pollution can occur and active monitoring systems are not well adapted to survey mercury in these settings," Dr. McLagan says. "Our system is small, cheap, portable, and notably they can be deployed in high numbers at the same time to assess how mercury levels change across three-dimensional space. There are a lot of holes in our understanding of mercury cycling in the environment - from releases to how it moves around the world to where it ends up and the impacts it has. MerPAS provides researchers all around the world the capacity to make key contributions to mercury science."

When asked about potential uses for MerPAS, Dr. McLagan points to artisanal small-scale gold mining operations and the associated illegal trading of mercury.

"Small scale gold mining is often unregulated and often illegal and there is also a huge black market for mercury, it has been growing exponentially in the last 30 to 40 years. Because it's so unregulated we can only guess how much mercury is being released. With this new technology you could potentially install a network of sensors in and around regions affected by small-scale gold mining, prevalent in South East Asia, South America and Africa, so we can start to learn how much mercury is being released into the air."

MerPas devices tied to a railing for monitoring Mercury
When emitted to the air, mercury, which is highly volatile, can last for about a year and travel long distances. Eventually, it can find its way into sediments and be transformed into methylmercury, an acute neurotoxin. It's been linked with a host of brain and nervous system disorders and has been found to be particularly harmful to the cognitive development of fetuses and children.

MerPAS was developed through Dr. McLagan's doctoral work in the Dept. of Physical and Environmental Sciences at the University of Toronto completed in 2018. The sampler was commercialized with Tekran Instruments Corporation, an environmental measurement technology leader serving industry, government, and research institutions, in 2018. This commercialization agreement has been the catalyst to the uptake of MerPAS into a series of mercury monitoring networks and use by independent researchers across the world.

"Without doubt, it is the global reach and impact that MerPAS has had that we are most proud of."

Learn more about the award on the Governor General's Innovation Awards webpage.

Story originally posted on the Faculty Arts and Science website.

Gordon Family Donation of Indigenous Artworks

Pictured left to right: Katie Gordon, Robert Gordon, and daughter Robyn. The artwork shown is titled, "Ospry" by artist J. Laford.

Alumnus Robert Gordon, BSc '85, and his family generously donated nine Indigenous artworks to the Department of Geological Sciences and Geological Engineering.

The pieces have been hung throughout the Miller Museum of Geology.

An unveilling event was held in the museum on Friday, November 17, 2023.

Scientists Crack the Code of What Causes Diamonds to Erupt

"Queen's researcher Christopher Spencer is part of an international team working on research that will revolutionize future diamond discoveries.

Dr. Spencer collaborated with researchers from the University of Southampton, the University of Birmingham, the University of Potsdam, Portland State University, Macquarie University, the University of Leeds, and the University of Florence to examine the effects of global tectonic forces on these volcanic eruptions spanning the last billion years. Their findings were published in the journal Nature."

Visit the Nature website to read more.

Story originally posted in the Queen's Gazette.

Class of '82 Gift

A huge thank you to the Class of '82, who came together to establish the "Bruce T. Evans Memorial Geology Field Study Fund" in memory of their classmate, Bruce Evans, BSc'82, BA'82.

In the words of the Class of '82, the fund should provide an "award to a student, in 3rd or 4th year, who exemplifies the characteristics that we associate with Bruce: perseverance and a dedication to his studies and a commitment to a career in the mineral exploration sector, with the awardee not necessarily requiring a high academic standing."

A wonderful article is written about Bruce by one of his aviation colleagues that showcases his dedication to geology and mineral exploration: https://www.vintagewings.ca/stories/flying-with-the-professor.

This memorial fund is a wonderful tribute to an exemplary alumnus.

Photography by Peter Handley. Source: Vintage Wings of Canada website.

GeoTrails

By Matt Fazzari and Emma Pluister

What is Geotrails?

Geotrails is a community outreach program intended to enrich Kingston and the surrounding communities with knowledge of the amazing geology that is right in their backyards. The idea of Geotrails is to make a web-based geological experience that people can follow along with as they explore preexisting hiking trails in the area.

Some of the places where new Geotrails can be expected are Gould Lake Conservation Area, Sheffield Conservation Area, and Marble Rock Conservation Area. These are just a few of the places where the virtual geological tours can be expected.

What Are WE Doing?

Kingston's Geotrails are a collaboration between GeoscienceInfo.com and Queen's Department of Geological Sciences and Engineering. Undergrad students Emma Pluister and Matt Fazzari are completing the field work for this project. This includes finding suitable trails, collecting pictures and information from the rock units, and learning about any history that may be relevant in the area. From here the Geotrail website is constructed; the trail is broken up into important stops where you can learn about the geology through pictures, diagrams, 3D models and maps.

The Completed trails will be hosted on the GeoscienceInfo.com website.

The Undergraduate Research Experience

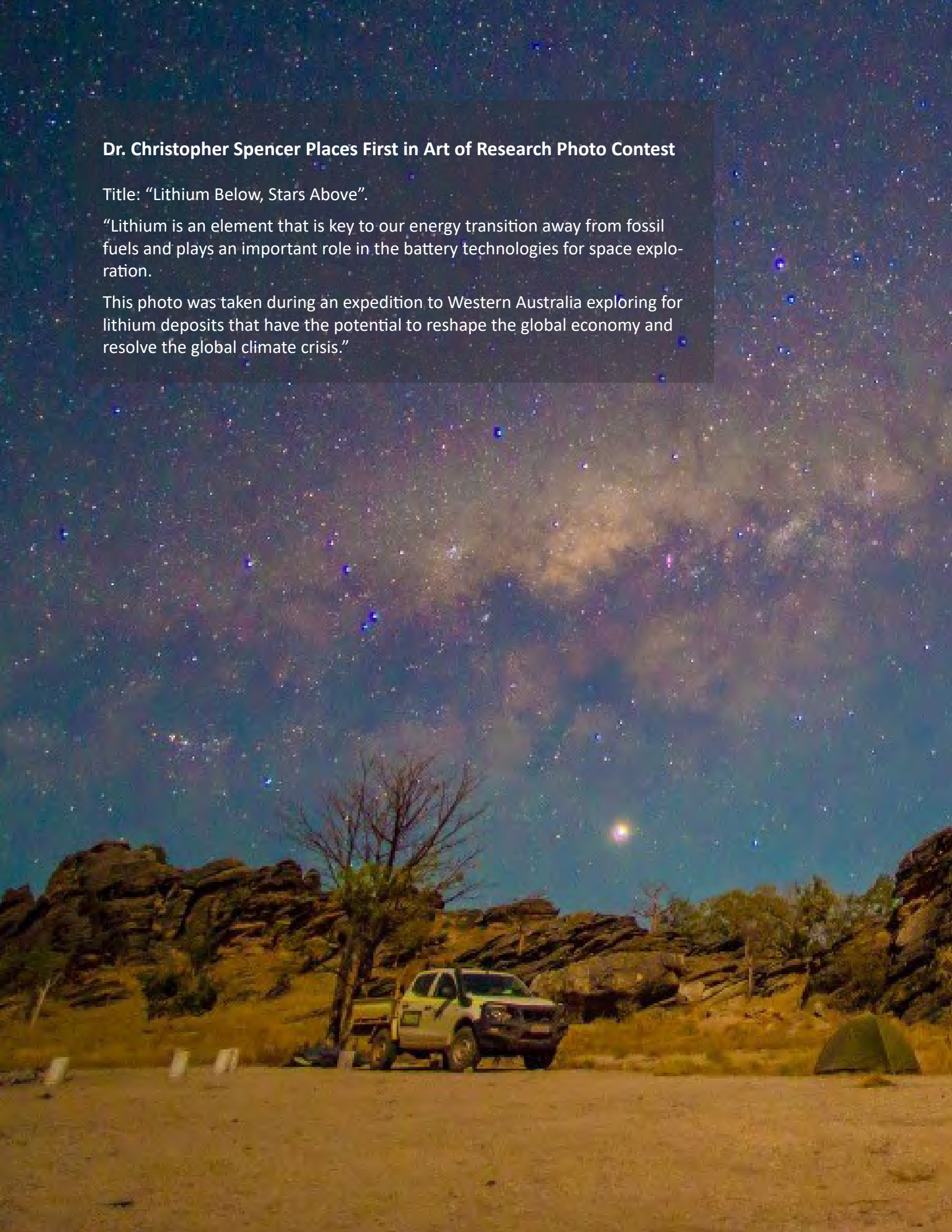
By Rob Harrap

In the summer of 1985 jobs in geology were hard to come by. I'd worked two summers in geology and one summer as a mechanical engineering assistant in a factory, and the factory welcomed me back, so it looked like that was the direction I was going. Then I got a call from the Department about a summer position to help with research projects, a golden opportunity to do something different and perhaps more resume-relevant than helping design straps for long-haul trucks. I called up my boss and he strongly encouraged me to take the job; he was very gracious about what was best for me despite it leaving him with a position to fill. And so I returned to Kingston and spent the next four months working for Peter Roeder and Dave Kempson helping with various projects they were working on. Among other things I used the old microprobe we had back then (presumably now in a museum of ancient technology), learned to prepare samples, got involved with the summer coffee culture of the Department, and experienced some of the realities of research. I realized that some of my book learning didn't translate well to research, that foundation knowledge was paramount, that I wasn't as good at math as I needed to be, and most importantly that research involves many stops and starts and small failures before something useful results. I remember my time with both Dave and Peter very fondly. They both had infinite patience and their voices were only ever raised when they were laughing. I still see Dave around town now and then, but Peter has of course left us.

These kinds of summer opportunities still exist, for the most part funded by NSERC and by professors with larger grants and lots of work to be done. Some involve fieldwork, some involve learning the intricacies of the QFIR geochem lab, and some probably still involve hours on the probe. I do know that they are limited opportunities; there are fewer of these than students who'd really benefit from an opportunity like I had, an opportunity that informed my decision to go to graduate school and, eventually, to get involved in teaching at Queen's.

This last summer we were gifted with a significant donation to the Azurite Fund for Summer Research by Gordon and Katherine Keep, to fund additional students of this type. I was lucky enough to have one student funded to work with me. The opportunity to work with a student for the summer in a way that reflected my own experiences was a gift. I've had many summer students before, but this time it was only one, and I treated it, I guess, how I felt Peter and Dave treated my summer with them: more about the education and less about the list of tasks to be done. Regardless of the exact experience on the job, though, the chance to see research, to experience Kingston in the summer, to take part in discussions about all kinds of projects (succesful or not) was a great experience for me, and I hope I helped make it a similar experience for my student. I still remember, for example, sitting at coffee in the old lounge on 5th Bruce and listening while Ron Peterson patiently explained to a townsperson that their sample was not, in fact, a meteorite but was in fact railway slag.

University funding is always precarious, and we are certainly in the shadow of the costs incurred by COVID-19, but I hope this program can continue so that more students can have an experience to see a different aspect of our Department.



Dr. Christopher Spencer Places First in Art of Research Photo Contest

Title: “Lithium Below, Stars Above”.

“Lithium is an element that is key to our energy transition away from fossil fuels and plays an important role in the battery technologies for space exploration.

This photo was taken during an expedition to Western Australia exploring for lithium deposits that have the potential to reshape the global economy and resolve the global climate crisis.”

FACULTY UPDATES

Dr. David McLagan Receives Governor Generals Innovation Award

Dr. David McLagan received the Governor General's Innovation Award, which celebrates excellence and impact in innovation across all sectors in Canada. Nominated by Universities Canada.

Read the full story on page 7.

Dr. Christopher Spencer Featured in "Nature"

Dr. Christopher Spencer was featured in Nature, again, as he was also featured in 2022.
This time was for being part of an international team working on research that has identified the breakup of tectonic plates as the main driving force behind the generation and eruption of diamond-rich magmas from deep inside the Earth. This research will revolutionize future diamond discoveries.

Dr. Elisabeth Steel Receives Early Career Award

Dr. Elisabeth Steel received the @BasinResearch Early Career Award 2022. Dr. Steel received the award for her paper titled, "Reconstructing subsurface sandbody connectivity from temporal evolution of surface networks"

Dr. Gema Olivo Receives Honour of Merit Award

Dr. Gema Olivo recevied the Honour of Merit from the University of Brasília, Brazil.
This award is given to alumni that have been recognized nationally and internationally for their contributions to society in their field of expertise.

Dr. Guy Narbonne and Dr. Peir Pufahl on the Paleontology field trip



Faculty Members Receive John R. Evans Leaders Fund Awards

Dr. Jennifer Day, Dr. Hom Nath Gharti, and Dr. David McLagan, each received John R. Evans Leaders Fund Awards from the Canada Foundation for Innovation.


Faculty Members Involved in Condor Nest Study

Dr. Daniel Layton-Matthews, Dr. Peir Pufahl, and retired Queen's Facility for Isotope Research (QFIR) Lab Associate, April Vuletich, were part of a group of researchers that studied a condor nest in Argentina. This work is highlighted in Science, BBC,and CBC Radio.

Dr. Raymond Price's 90th Birthday Celebration

On Friday, April 21, 2023, the Department held an event to celebrate the 90th birthday of Emeritus Professor, Dr. Raymond Price.

The event consisted of talks by Dr. Christopher Spencer, and Emeritus Professor Dr. John Dixon, as well as a tribute to Ray read by Professor Rob Harrap on behalf of Dr. Laurent Godin

Ray's family, member of the current GSGE community, Emeritus Proffesors and local Alumni were all in attendance to celebrate Dr. Price.

STUDENTS

Dr. Bas Vriens and his current research group/graduate students

STUDENT Accomplishments

PhD Student receives the 2023-24 The Queen Elizabeth ll Graduate Scholarship

PhD student, Stephanie Bringeland, received The Queen Elizabeth ll Graduate Scholarship in Science and Technology (QEII-GSST) for 2023-24. Stephanie is in the Geodesy & Geophysics Group, supervised by Dr. Georgia Fotopoulos.

Graduate Student Receives CFG Dennis Becker Award

PhD student, Émélie Gagnon, received the Dennis Becker Award from the Canadian Geotechnical Society and the Canadian Foundation for Geotechnique (CFG).

PhD Student Receives Best Poster Award

PhD student, Tiago Valim Angelo and collaborators Dr. Christopher Spencer (supervisor), Dr. Mitchell Kerr, Dr. Jacob Hanley (both from Saint Mary's University in Halifax) and Evelyne Leduc (Queen's Facility for Isotope Research) received a Best Poster Award at the 2023 Xth Hutton Symposium.

Graduate Student receives the 2023-24 The Queen Elizabeth ll Graduate Scholarship

Graduate student, Michelle Pearce, received the 2023-24 The Queen Elizabeth ll Graduate Scholarship in Science and Technology (QEII-GSST) from Queen's University.

Graduate Student Receives Bolton Award from GAC

Graduate student, Danielle Fitzgerald, received the 2023 Bolton Award from the Paleontological Division of the Geological Association of Canada (GAC), for Best Student Presentation.

KEGS Scholarship Award Recipients

The following students received KEGS Foundation Scholarship Awards:

- Lilian Susin, 5th-year B.A.Sc. student
- Kiana Damavandi, 2nd-year M.A.Sc. student
- John (Jack) Fitzgerald, 1st-year M.A.Sc. student
- Siti Robiah Ummu Karomah Al Wardah, 3rd-year Ph.D. student
- Neeraj Nainwal, 3rd-year Ph.D. student
- Netsai Wiboonwipa, 2nd-year Ph.D. student

Undergraduate Student Receives SEG Canada Foundation Scholarship

Fourth year Geological Sciences student, Caroline Barnes, received an Undergraduate Scholarship from the Society of Economic Geologists (SEG) Canada Foundation.

GEOL/E 337 Paleontology

"Under sunny skies we saw Ordovician hypersaline tidal flats, some of the oldest coral reefs in the world, surfaces with fossils so dense you couldn't avoid stepping on them, and finished off with graptolites and a special trilobite found at the very end of the trip"

- Dr. Guy Narbonne

MASTER OF EARTH AND ENER

Our Mission

The Master of Earth and Energy Resources Leadership (MEERL) program provides future leaders in the natural resource industries with the essential skills and aptitudes needed to tackle the most challenging technical, economic, political, institutional, social, and environmental questions concerning the future of the earth and its resources.

MEERL nurtures transformative leadership that balances the need for sustainable and equitable access to the earth's resources with the collective and individual responsibility to protect and preserve the environment in which we all live.

Welcome to MEERL '25

Join us in welcoming the MEERL Class of 2025 who travelled to Queen's University, for their first residential session. We are thrilled to introduce our largest cohort yet, comprising 13 students hailing from diverse backgrounds in the natural resource industry, including geology, engineering, sustainability, and environmental.
To kick off their program, students took part in workshops, started their first courses, participated in networking events, and immersed themselves in the vibrant Queen's and Kingston communities.

RGY RESOURCES LEADERSHIP

Get to Know MEERL

April 2022, students from cohort MEERL '22 and '23 completing an economics class together in Calgary

Although 90% of our students are based in Canada, MEERL students come from **18 different countries** - bringing their international experience to the classroom.

68
Current Students & Alumni

95%
Graduation Rate

50/50
Energy & Mining

34
Average Age

7.5
Average Years of Work Experience

80%
Students who change jobs during or within 18 months of finishing MEERL

Student Spotlights

Andrew Evans, MEERL ‘21
Exploitation Engineer
Tourmaline Oil

Andrew Evans, a graduate of MEERL and an engineer at Tourmaline Oil Corp, used his time in MEERL to explore an idea he had for industry. In the Sector Focused Project course, he drew on the many learnings of MEERL to design and present a strategic business plan titled "Natural Gas Transportation Sector Initiative".

Two years later, his project became reality. Tourmaline Oil and Clean Energy announced a $70 million joint development to build compressed natural gas station in western Canada. This project will significantly reduce emissions and generate huge cost savings for the transportation industry.

It's incredible to see a MEERL project executed at the industry level with such a major impact. Way to go Andrew!

Annie is a biologist who works for the Alberta Energy Regulator out of Edmonton. She provides technical analyses for all aspects of energy projects including oil sands and coal mines and surface oil and gas, as well as pipelines from initial application, operations, to closure and reclamation. After graduating MEERL she was promoted to a leadership role and now manages a team at the regulator.

> MEERL has truly allowed me to experience multiple perspectives and dimensions in the energy sector. No other professional development has given me the opportunity to learn directly from experts and aspiring leaders in industry, regulatory, legal and financial sectors. This allowed me to gain an intimate understanding of the intricacies and complexities of natural resource development firsthand."

Annie Jian, MEERL ‘21
Manager, Environmental Science Applications
Alberta Energy Regulator

Abel Ouedraogo, MEERL ‘23
Project Manager
Artisanal Gold Council

Abel Ouedraogo was born and raised in Burkina Faso. He was exposed to artisanal and small-scale gold mining at a young age and experienced firsthand the challenges that communities face within the AGSM sector. This led Abel to get a master’s degree in Geology from the University of Ouagadougou.

He spent the last 15 years working in mineral exploration, mining, and environmental assessment in both Western Africa and Canada. After starting MEERL, Abel accepted a job at the Artisanal Gold Council, a non-profit improving the lives and conditions of artisanal and small-scale gold miners.

Abel now works directly with AGSM communities in Western Africa, providing education and training - giving Abel the opportunity to apply what he’s learned in MEERL directly to the communities where he grew up.

Term Adjunct Position Available

EERL 808 Minerals Life Cycle Track

The Department of Geological Science and Geological Engineering at Queen's University invites applications from suitably qualified candidates interested in teaching the course Minerals Life Cycle (EERL 808), within the Master of Earth and Energy Resources Leadership program. This is a fall term course, however duties for the program, including updating course content, cover an appointment period of March 1, 2024, to December 31, 2024. Candidates should have an M.A. or M.Sc. or Ph.D. and teaching experience at the University level and/or professional experience in the extractive natural resource field.

MEERL is a fast-growing programme that provides emerging leaders in the natural resource industries with the skills and aptitudes needed to tackle the most challenging technical, economic, political, ethical, social, and environmental questions regarding the future of the earth and its resources. MEERL graduates are at the forefront of the transformation of the natural resource sector, driving positive change in their organizations and communities.

EERL 808 is an online, elective course, open to students enrolled in the Master of Earth and Energy Resources Leadership Program, with an expected enrolment of 10-15 students.

We are seeking a candidate who is familiar with all key aspects of the minerals life cycle and who can think broadly across the earth and energy resource sectors, engaging with a wide range of topics that may be technical and/or non-technical in nature. Preference will be given to candidates who are willing to commit to teaching the course for a minimum of 2-3 calendar years.
Term Adjuncts are expected to engage virtually with students continuously throughout the term, including during weekly live sessions that typically take place on weekends. They are also expected to participate in regular faculty meetings.

Applications will be received until January 5, 2024. Review of applications will commence shortly thereafter, and the final appointment is subject to budgetary approval. Additional information about the MEERL program can be found at https://www.queensu.ca/earthenergyleadership/home.

More details about the position and how to apply can be found on the Department of Geological Sciences and Geological Engineering website.

MEERL students in the field

ALUMNI UPDATES

Field School 2004

Alumna Among the First to Examine Asteroid Pieces from NASA's OSIRIS-REx Mission

"Michelle Thompson, planetary scientist and expert in space weathering, is one of the first six humans — and the first woman — to analyze samples of asteroid Bennu brought to Earth by OSIRIS-REx."

"This is a truly once-in-a-lifetime — maybe a once-in-several-lifetimes — experience," Thompson said. "OSIRIS-REx was selected in 2011, the year I started my PhD, and launched in 2016, the year I got my PhD. It reached Bennu in 2018, the year I came to Purdue. And now I am going to be one of the first humans to get to study it. Bennu is a treasure trove of information; this is literally the project of my career."

Read the full story on the Purdue University website.

(Purdue University photo/Rebecca Robiños)

In Memory of Donald Bubar

Donald Stephen Bubar, long-time President and CEO of Avalon Advanced Materials Inc., passed away in his home on July 30, 2023, at the age of 68.

The Bubar family has a strong connection with Queen's Department of Geological Sciences and Geological Engineering. Don graduated with an MSc in Mineral Exploration in 1981. He was married to Marcia Mazurski who completed an MSc in Geology in 1982. Their son Andrew Bubar completed an MSc in 2019 under the supervision of Dr. Heather Jamieson.

Don was known as a visionary who recognized years before most others the importance of critical minerals for the Canadian economy. He also advocated for greater and earlier engagement with Indigenous communities through the PDAC and Avalon.

A full description of Don's contributions to geology and mining can be found on the Mining.com website.

Engineering a New Brew

Photography by Candice Ward

Ted Fleming is turning the non-alcoholic beverage industry on its head

When Ted Fleming, Sc'00, launched a Kickstarter campaign for his non-alcoholic craft beer company in 2017, the move seemed like a departure from his engineering roots. But for Fleming, what he learned as an engineering student at Queen's still applies to his work in the non-alcoholic brewing industry. Now the founder and chief executive officer of Partake Brewery in Toronto, he explains that the lessons offered by a Queen's engineering degree allowed him to approach his business from a problem-solving perspective.

"I think that's partly why I chose the program; it helped with my adaptability. In engineering, you face difficult problems, but also get exposure to social sciences and things that help you look at how issues impact people. That adaptability was a key lesson for me, and I think that's how I've approached business. Every business is just a series of problems that need to be solved, and I've found having an engineering mindset is very important to managing that process," says Mr. Fleming.

After making dietary changes necessary because of a Crohn's disease diagnosis in 2005, Fleming realized what he missed most was the social connections that blossomed when friends and colleagues would go for a drink. Switching to non-alcoholic beer introduced him to a space that had been neglected by brewers, retailers, and the hospitality industry.

For Mr. Fleming, it was a new problem to solve.

Wanting to create an inclusive space where those drinking non-alcoholic beverages didn't have to compromise on taste or experience, he developed a non-alcoholic craft beer that offered consumers a low--calorie alternative but still provided the craft beer experience. It's a product that's resonated with consumers and Partake has grown considerably since its Kickstarter roots five years ago. The company was completing its second financing round in March 2022, raising $16 million, and earlier this year Mr. Fleming was named a 2022 Globe and Mail changemaker. Partake's success hasn't gone unnoticed and is changing the conversation in the wider industry.

"We've had this tremendous shift towards people who are drinking non-alcoholic beer who don't have to be. And they're choosing to do so partially because companies like ours are creating great products and it's no longer a compromise to drink non-alcoholic beer. It's a fundamental shift in terms of who's coming into the category and it's very exciting. We can pitch to any beer drinker now because they're not missing a beat socially or in terms of health."

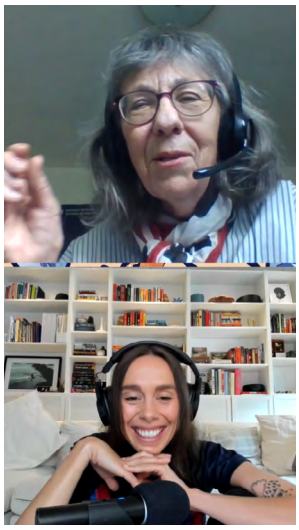
Story originally posted on the Queen's Gazette.

Paving the Way for Representation in STEM

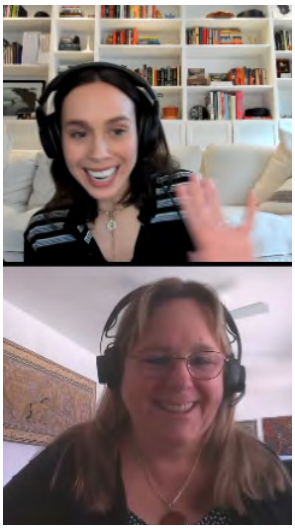
Alumna Alexis Armstrong, MSc'16, MBA'23, creates "The Smoko Podcast", highlighting women in STEM, and "Peggy's Workwear", a line of workwear made for women.

I still remember the first time I ever set foot in a Geology classroom. It was GEOL 2213 History of Life at Acadia University taught by Dr. Pier Pufahl. From that moment on, my life forever changed. Through Pier I got introduced to Dr. Noel James and Dr. Guy Narbonne, and fast forward to 2016 I graduate from Queen's University with a Masters in Geology. That was the beginning. Through my education and experience at Queen's I landed a wonderful career at IODP and for that I will be forever grateful. More importantly however, I also met mentors, colleagues, and friends who have become the inspiration for the Smoko Podcast and Peggy Workwear.

Throughout my professional career I would routinely get the question of "you!? A geologist?" which would never surprise but would always infuriate. Yes, I was a geologist, and in fact knew many women who were geologists. Even knew some engineers. The reason why this question infuriated me was that scientists and engineers to me have always been women. At university and professionally I had the honour of meeting and working with women who were whip smart and passionate about what they did or studied. I realized that when asked to describe someone in STEM a typical person may not envision myself, my sister, my friends, or my mentors.



Alexis has interviewed Dr. Heather Jamieson (left) and Dr. Jean Hutchinson (right) on "The Smoko Podcast".



This led to the creation of my company: The Smoko Podcast and Peggy Workwear. The Smoko Podcast is a platform in which women and non-binary folk can tell their story, however they'd like to tell it. We highlight their technical abilities, interests, accomplishments, and community initiatives. Our platform showcases community members, leaders, professors, and organizations. From plumbers to physicists and carpenters to chemists, we showcase all sub-fields of the community. As we know, "you can't be it, if you can't see it." Whereas Peggy Workwear creates technical workwear designed by and for women in industrial spaces. From the shop floor to the boardroom, our garments are designed to fit and function for our customers every day; whatever that may be. After all, we've been in their boots.

Our mission is to increase representation of women and non-binary folks within non-traditional roles. Our vision is that through community, authentic storytelling, and accessible and functional garments we will be able to reform culture and redesign industrial spaces. Our hope is that future generations will not have to face that infuriating question and when asked, a typical person would envision someone in STEM looking a lot like me and you."

- Alexis Armstrong, MSc'16, MBA'23

www.peggyworkwear.ca www.smokopodcast.ca Peggy Workwear Instagram Smoko Podcast Instagram

Pictured left: Alexis's grandmother, who Peggy's Workwear is named after. Pictured right: Alexis with her grandmother

Alumni REUNIONS

Homecoming 2023

Thank you to everyone who came out to alumni receptions this past year!

In 2024 we will be hosting receptions at the Vancouver RoundUp, PDAC, and Homecoming. We look forward to seeing many of you then!

Alumni Highlights

Paige Mamer (nee Snelling), BSc'07, MASc'09 was awarded the Geoscientists Canada Fellowship.

Connor Langford, BSc'08, PhD'13, was named one of the Forty Under 40 by Business Intelligence for BC (BIV).

Jelena Puzic, BSc'96, was featured in the Globe and Mail for "Mining industry's campaign to fund genetic sequencing technology at BC Children's Hospital".

Give to Queen's Geo: Advancement PRIORITIES

Research Chairs or Professorships

We are all concerned about our lack of a full time Professor of Mineralogy. Mineralogy is the foundation of all geological materials. We are seeking a Chair in Mineralogy, and wouldn't it be fantastic if we could attract one with an interest in those robotic "geologists" sampling on Mars!

With impending retirements in our world-renowned geotechnical engineering group, a chair to recognize this crucial area of geological engineering would allow us to maintain and grow this strength. Geotechnical Engineering in Natural Hazards or Geomechanics would recognize the importance of this expertise in "smart" engineering of urban, rural and remote infrastructure including roads, rail, pipelines, tunnels, mines, deep geological disposal of nuclear waste, landfills, and development (high rises to industrial parks to transport). Infrastructure requires geological knowledge for monitoring and resilience to climate change and natural and human-induced hazards such as landslides, and earthquakes etc. Such a chair would attract considerable funding from government and industry.

Queen's Department of Geological Sciences and Geological Engineering hasn't a single research chair, unusual for an earth science department as successful as ours.

Funding for Field Learning

Funding for Field Learning: Both undergraduates and grads benefit enormously from the transformative learning that occurs in the field. Field learning requires students to constantly revise their conceptualizations of geological systems as they make and curate new observations/ data. Field learning is resource-intensive requiring teaching faculty, TA's, and logistics support, transportation, etc. Alumni recognize the importance of field learning to the training of highly successful geoscientists. The current field fund, with sub-funds, is used at the discretion of the department to offset costs such as TA salaries and logistics.

Named TAships

Named TAship funds support student learning by increasing the number of TAs that we can deploy to assist student in the lab and the field. The Named TAships range from the endowed Dr. W Pearson TAship to five year expendable TAships. Each term we invite students to nominate their TA's to receive the honour of a named TAship1 award, in recognition of their exceptional teaching ability. We make the awards public during the "Welcome to 2nd Year pizza lunch" and "Well Done GEO" events. Each awardee then writes a letter of thanks to the donor.

Azurite fund for undergraduate research

Started in 2021, the Azurite Fund provides about two-thirds of a salary for a Queen's undergraduate student to undertake summer research within a research group in the department. (Faculty members are required to top up the salary to the minimum required for the NSERC USRA.). This is a terrific way to aid new professors in extending their research funds, "auditioning" students for graduate work and helps students to decide if research is for them. The Azurite fund assisted six students since 2021, six in 2022, and eight in 2023.

A new idea, not yet funded but awaiting a bold A new idea, not yet funded but awaiting a bold name and a keen alumnus or alumna, would allow us to attract members of under-represented groups at other universities in Canada to summer research positions at Queen's. The funds would subsidize travel and living expenses, as well as salary.

I'd be happy to discuss further any of these opportunities. Don't hesitate to email me at remendav@queensu.ca.

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DEPARTMENT OF
GEOLOGICAL SCIENCES AND
GEOLOGICAL ENGINEERING

Left to right: Alumnus Matias Silva Caceres, MSc'23, Postdoctoral Fellow, Dr. Adriana Guatame-Garcia, and MSc student, Jaabir Ali.