2025 YEAR IN REVIEW

QUEEN'S MINER

AN ANNUAL REVIEW OF THE ROBERT M. BUCHAN DEPARTMENT OF MINING

SMITH ENGINEERING
Queen's University

Robert M.Buchan
Department of Mining

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Annual Review of the Robert M. Buchan Department of Mining, Queens University, Kingston, Ontario, Canada.

DEPARTMENT HEAD MESSAGE

Dear Queen's Mining Alumni and Friends,

Greetings from Kingston! It is my privilege to write this message as a new Head of the Robert M. Buchan Department of Mining at Queen's University. I am proud and humbled to serve our many constituents as we move the department into the future.

I joined the department in January 2025, after serving nine years as a faculty member at the Pennsylvania State University and 15 years at West Virginia University (WVU), both in the United States. I was also a Chair of the Department of Mining Engineering and Interim Chair of the Wadsworth Department of Civil and Environmental Engineering at the latter. I was employed with Krupp Canada in Calgary, Alberta from 2000-2001, and was responsible for the design of mining equipment. I was also involved in the planning and design of coal, bauxite and limestone mines in Serbia and Montenegro from 1992 through 2000.

Since I have arrived in Kingston, I have been overwhelmed by the amazing dedication and work ethic of our students, staff and faculty, as well as the unmatched support to the Buchan Department by our alumni, friends and mining industry. Because of these contributions, the Buchan Department is positioned to continue educating students who will be prepared to tackle multidisciplinary and complex challenges. Our undergraduate student numbers have grown significantly in recent years. Second-year enrollment rose from 16 students in 2017 to 54 in 2025, while total undergraduate enrollment increased from 87 to 171 students in the same period. We're particularly proud of the rise in female enrollment, which grew from 14% in 2017 to 32% in 2025. Today, we are the largest undergraduate mining program in North America, with more students than any other mining program in Canada or the U.S. As of Fall 2025, we also have 18 MASc, 24 PhD, 12 MEng, 11 SPMEI, 81 CMT and 24 BTech students. We also offer flexible, self-paced online courses for professionals, covering topics such as Mining and Mineral Resources, Introduction to Mineral Processing, and Data Science in Mining.

In terms of faculty, we have experienced significant changes over the last two years. After decades of dedicated service to the Department, Smith Engineering, and Queen's University, three long-serving faculty members - Dr. Laeeque Daneshmend, Dr. Chris Pickles, and Dr. Sadan Kelebek - have retired. In addition, former Department Head, Dr. Julian Ortiz has continued his academic career in the United Kingdom, and one of our most accomplished researchers, Dr. Ahmad Ghahreman, has transitioned to a career in industry. These retirements and departures have left a notable void within the department. With the support of Dr. Kevin Deluzio, Dean of Smith Engineering, and Dr. Matthew Evans, Provost of Queen's University, we are currently recruiting for three new faculty positions. We are optimistic about welcoming these new colleagues by July 2026. Their expertise, fresh perspectives, and innovative spirit will enhance our teaching mission and drive impactful research within the department.

This year, we successfully completed the Canadian Engineering Accreditation Board (CEAB) visitation and evaluation. We are proud to report that the mining program at Queen's has received full accreditation for the next six years. We are grateful to Dr. Takis Katsabanis who led the department through the accreditation process. His passion and commitment to the department have been unmatched.

We also established the Queen's Mining Advisory Board (QMAB), which includes representatives from across the mining industry. The QMAB's mission is to provide strategic advice and support to the department in achieving excellence in education, research, service, and fundraising.

In March of this year, our senior mining students embarked on a week-long professional field trip to the United States, visiting Nevada Gold Mines, the Epiroc Surface Mining Automation Center, and FLSmidth laboratories. Meanwhile, our second-year students participated in site visits to several surface and underground mines and mineral processing facilities in the Timmins and Sudbury regions, and our graduate students visited industrial minerals mine and processing plant in the Havelock area - invaluable hands-on learning experiences for all involved.

The department also remained active in engaging with our alumni and industry partners at major events, including the PDAC Conference in Toronto and the CIM Conference and Exhibition in Montreal. Our annual Mining Pathways 2025 event was another resounding success, attracting several leading mining companies to the department. Students had the opportunity to connect with industry professionals and explore future career opportunities.

Our mining students landed internships and they worked for a number of companies, nationally and internationally, including Canadian Natural Resources Limited, Agnico Eagle Mines, Elk Valley Resources, Imperial Oil, Alamos Gold, Kinross Gold, Franco-Nevada Corporation, Centerra Gold, Foran Mining, Lake Shore Gold, Suncor Energy, Nevada Gold Mines, Orla Mining, Teck and Vale.

On the National Day for Truth and Reconciliation, we were honoured to host Christy Smith-Hadath, Senior Vice President of Indigenous Engagement & Human Environment at Falkirk and a member of the K'ómoks First Nation. Christy's lecture, First Nation Voices in Mining, offered an inspiring and thought-provoking discussion on reconciliation and the importance of strengthening relationships between the mining industry and Indigenous communities. The department will focus on strengthening Indigenous engagement and community partnerships, following the example set by recent guest lecture and reconciliation-focused initiatives. Building capacity for Indigenous participation in mining education, research, and governance will remain a key long-term priority.

As the Department Head, I encourage our students to get actively engaged in professional societies, attend professional meetings, industry related events and mine trips, sign-up for job interviews with mining companies, take part in student competitions and volunteer to assume leadership responsibilities in order to build valuable skills and accumulate experience that will serve them well in their future professional careers. Thank you for welcoming and mentoring them in all venues. Please let us know if there are other opportunities for students to participate in. I also advise and encourage them to apply and compete for many external scholarships that are awarded to mining engineering students. To that extent, I am happy to report that our students have won several national scholarships and awards; they make us very proud of their achievements. This newsletter contains several articles that highlight the achievements, accomplishments and activities of our students and faculty, and I do hope that you will enjoy reading them.

Please remember that your feedback, observations and experience with the Buchan Department of Mining, either in person, by e-mail or by phone, is always welcome and much appreciated. My office door is always open, and you are welcome to share information about any aspect of our department. I will be listening to your suggestions to continuously improve. The faculty and staff of the department are fully committed to provide all our undergraduate and graduate students with a friendly, conducive and supportive educational environment. As the Head, and on the behalf of the faculty, staff and students, I thank you very much for your support and commitment to the Robert M. Buchan Department of Mining.

I wish you all safe, healthy and happy New Year.•

Vlad Kecojevic, PhD
Professor and Head
Norandra-Falconbridge Chair in
Mine-Mechanical Engineering
The Robert M. Buchan Department of Mining

FACULTY UPDATES

Charlotte Gibson, PhD
Assistant Professor & Associate Department Head

In 2025, my research program in the Critical Minerals Processing Laboratory continued to expand its scope in the beneficiation of lithium- and niobium-bearing ores central to Canada's critical minerals strategy. New projects funded this year include a Critical Minerals Innovation Fund (CMIF) collaboration with Rock Tech Lithium and Stark Resources, focused on developing advanced ore sorting and flotation technologies to improve lithium recovery from low-grade pegmatite deposits. In parallel, a new NSERC Alliance collaboration with Dr. Rachel Baker (Chemical Engineering) and Dr. Béland (Mechanical and Materials Engineering) was launched to develop flotation reagents synthesized from pulp and paper by-products—part of an emerging research stream exploring the use of computational chemistry to develop green chemistry approaches to mineral processing. These initiatives build on ongoing partnerships with Vale Base Metals, Glencore, SK Godelius, SGS Canada, and the Government of the Northwest Territories, and collectively strengthen Queen's position as a leader in critical minerals research and technology development.

This year also marked several highlights in professional and academic engagement. In February 2025, I represented Queen's and Canada's mining research community as a panelist at the Canada in Asia Conference in Singapore, contributing to a discussion on "Canada as a Stable Provider of Critical Minerals for Asia's Clean Technologies." I also served as Chair and co-organizer of the Laplante–Laskowski Symposium on Mineral Processing Fundamentals at the Canadian Mineral Processors (CMP) Conference 2025 in Ottawa. The symposium brought together international experts from industry, academia, and government to share advances in mineral processing fundamentals and critical minerals beneficiation.

In teaching, I continued to deliver MINE 201, MINE 331/335, and MINE 885: Mineral Processing, combining experiential laboratory instruction with new digital learning tools. The Virtual Reality Copper Concentrator, developed in collaboration with BBA Engineering, remains integrated across core courses, enhancing student understanding of process operations through immersive learning.

I was honoured to receive the AMS Undergraduate Research Mentorship Award (2025) in recognition of excellence in student supervision and research mentorship. Overall, through 2025, I have been focused on advancing innovative, sustainable mineral processing technologies, fostering national and international collaborations, and continuing to prepare the next generation of engineers for leadership in Canada's critical minerals future.•

Mahmoud Alzoubi, PhD
Assistant Professor

Upon my appointment at Queen's University, my research group have ventured into three research themes: Hydrogen implementation as a clean alternative fuel for mining operations, the impact of permafrost degradation on mining operations and critical infrastructure in northern

Below, Left: *Dr. Charlotte Gibson's The Critical Mineral Processing Lab research group at the Canadian Mineral's Processors Conference, Ottawa, ON, January 2025.*
Below, Right: *Dr. Mahmoud Alzoubi with Jean-Philippe Linteau, the Canadian Ambassador to Saudi Arabia , January 2025*

Canada, and the decarbonization of underground mining ventilation. Although these three topics may seem separate at first glance, they all share a common goal: improving energy efficiency. To address challenges within these areas, I established the Energy Efficiency Engineering Laboratory (EEE Lab), which aims to bridge the gap between traditional mining engineering and state-of-the-art experimental and computational techniques that enable cutting-edge research related to these interconnected themes.

My research expertise lies in multi-scale and multi-physics transport phenomena in porous media applied to mining applications. This includes fluid mechanics, conjugate heat and mass transfer, thermodynamics, and subsurface fluid-structure interaction. Grounded in a strong interdisciplinary foundation in mining and mechanical engineering, my research blends theory and practice to solve pressing engineering problems in mining sector with both rigor and innovation.

The "Hydrogen Integration for Sustainable Mine Ventilation and Heating" project was recently selected for funding through the Scotiabank Climate Action Research Fund, a highly competitive program awarded to only ten research groups. This recognition highlights the strategic importance of advancing hydrogen technologies within the mining sector. This is the first time a faculty member at Queen's University has received this award, marking a significant achievement that underscores the project's national and international impact.

On the other hand, within my first two years at Queen's University, I have taught diverse portfolio of undergraduate and graduate courses that reflect both the applied nature of mining engineering and my interdisciplinary expertise. During the last two years, I took the lead in fully transforming the Mine Ventilation course (MINE 339) into a rigorous, design-intensive course. I also restructured the Asset Reliability Management course (MINE 459) to serve as a beacon for students across the full spectrum of engineering disciplines.

Beyond the classroom and laboratory, I actively work to raise the profile of our department and build strategic industry partnerships. In September 2024, I represented the department at MINExpo 2024 in Las Vegas. I also invited two undergraduate students from MinSoc to showcase our student community to leading mining companies. This engagement aimed to strengthen industry collaborations and highlight our professional development programs.

In January 2025, I attended the prestigious Future Minerals Forum (FMF2025) in Riyadh, Saudi Arabia, as part of the Canadian Pavilion. There, I engaged with senior executives from major mining companies, met with department heads from King Abdulaziz University and King Fahd University of Petroleum and Minerals, and held discussions with Dr. Arwa Allinjawi, Vice Dean for the Female Campus at King Abdulaziz University, who expressed strong interest in our Women in Mining initiative. I also met with the Canadian Ambassador to Saudi Arabia to explore new avenues for connecting our department with key stakeholders in the Saudi mining sector.•

Asli Sari, PhD
Associate Professor

Queen's University's Robert M. Buchan Department of Mining is at the forefront of a technological revolution, leveraging the power of artificial intelligence and data analytics to create safer, more efficient, and sustainable mining operations. My research team and I, at the Intelligent Mining Systems (IMS) Lab, have

Below, Left: *Dr. Asli Sari's The Intelligent Mining Systems (IMS) Lab* | **Below, Right:** *Dr. Farzaneh Sadri's research group*

recently made significant strides in several key areas, attracting substantial funding and fostering impactful collaborations with industry partners.

A cornerstone of our research is the development of predictive maintenance systems for critical mining equipment, such as haul trucks. As a part of this industrial collaboration project, machine learning is used to predict failures and detect anomalies in haul truck operations. The work encompasses the analysis of haul truck sensors, operational data, and the development of models for proactive maintenance scheduling.

Ongoing work with a leading digital mining solutions company is focusing on a deep reinforcement learning-based dispatch system, which aims to minimize truck idle time and optimize maintenance frequency. This real-time haul truck allocation approach considers critical factors such as truck location, shovel productivity, ore grade and truck reliability. It is also robust to unexpected events, such as truck or shovel breakdowns, and accounts for variable wait times at queues. Specialized sensors and integrated IoT signals are used in guiding the decision-making, ensuring a dynamic and responsive dispatch strategy.

Beyond efficiency, my team is tackling the critical issue of mine safety. Their machine learning-driven approach to cave mine pillar stability analysis, in collaboration with Steve McKinnon, was tested in a case study conducted at the Chuquicamata underground cave mine. The results have demonstrated an impressive 80% accuracy in predicting pillar collapses, exceeding the capabilities of traditional methods and representing a significant advancement in risk management. This innovation directly addresses one of the most significant risks in underground mining.

Furthermore, the IMS Lab is actively engaged in projects focused on decarbonization, including optimizing energy consumption in mineral processing circuits and evaluating the economic and environmental benefits of transitioning to all-electric haulage fleets. Collaborating with Qian Zhang, a recent simulation model demonstrated potential GHG emission reductions of up to 92.6% and operating cost savings of 40-62% with electric trucks, paving the way for a more sustainable mining future. Also, an extension of the dispatch approach has been developed to significantly reduce fuel consumption. Preliminary findings show the potential for substantial cost savings and a reduced (up to 30%) carbon footprint, only by using an intelligent dispatch approach.

Our goal is to translate cutting-edge research into practical solutions that benefit the mining industry and the communities it serves. By forging strong partnerships and applying advanced analytical techniques, we're helping to build a smarter, safer, and more sustainable mining sector." More information on the IMS Lab's projects can be found here: https://ims.smithengineering.queensu.ca/

2025 has been a particularly productive year for my team, marked by continued research excellence, expanded industry collaborations, and a commitment to pedagogical innovation.

Our research program remains highly active, with publications appearing in top-tier journals such as Journal of Cleaner Production and Rock Mechanics and Rock Engineering. My team has presented our work at prestigious conferences including the CIM Convention, Deep Mining Conference and CEEA, showcasing the latest advancements in intelligent mining systems.

Key accomplishments this year include securing a new NSERC & Mitacs application with Weir Motion Metrics' support for a total of $304K in funding to support research in Intelligent haul truck dispatch under dynamic conditions and another application with Thorn Associates' support for $80K for the project titled *A reinforcement learning based control approach for grinding circuits to decarbonize mineral processes*. These fundings will bolster the Intelligent Mining Systems Lab's capabilities and support graduate students. Additionally, a new chapter in collaboration has been secured with MIRARCO and one of the OEMs on the OCI application "Strategic Mine Plan Optimization: Robustness and GeoSequencing", which resulted in a new post-doctoral position in her lab.

I am actively involved in mentoring a diverse group of graduate students, guiding them toward impactful careers in mining engineering. Two of my Master's students, Cristian De Jesús Aguirre Zurita (Thesis: Fuel consumption analysis in diesel haul trucks using machine learning) and Kellem Deuitch (Thesis: Reinforcement learning applied to open pit mine haul truck dispatch under stochasticity and deviations), successfully defended their theses and graduated. My PhD student, Ricardo Quevedo, successfully passed his comprehensive examination with his proposal, titled *Data-driven frameworks for machine learning applications for geomechanical risk assessment applied to major*

caving hazards.

I am shaping the future of mining engineering education at Queen's University through participation in the Reimagining Engineering Education (REE) initiative. This year, I spearheaded a pilot project designed to enhance student learning through project-based learning and adaptable assessment strategies.

As part of this initiative, MINE 272 Applied Data Science was redesigned to incorporate a term project closely aligned with real-world industry challenges. A key partnership with Komatsu was established, providing students with access to valuable data and a mining engineering problem to solve. Four student groups of five students each worked on the project of truck fuel consumption estimation based on internal and external factors and suggested recommendations, such as truck payload and speed adjustments to optimize the fuel consumption per carried tonne. This hands-on experience allowed students to directly engage with industry professionals through meetings and presentations, fostering valuable networking opportunities and practical skill development.

In addition to project-based learning, I have explored the potential of large language models to create adaptable assessment strategies. A generative AI bot, "QUAN bot," developed with the support of the Engineering Teaching and Learning Team, personalized feedback and a more dynamic learning environment. While maintaining a strong foundation in fundamental concepts, assessed through traditional closed-book examinations, QUAN bot also aims to equip students with the skills to effectively leverage AI in their future careers.

My aim is to equip students with the skills and knowledge they need to succeed in a rapidly evolving mining industry. By integrating project-based learning, industry collaborations, and innovative assessment techniques, we're ensuring that our graduates are well-prepared to tackle the challenges of tomorrow. I have also delivered invited lectures to both undergraduate and graduate courses, sharing her expertise and fostering an engaging learning environment.

In November 2024, Anne Johnson and I were honoured as recipients of the prestigious "100 Women in Mining" award (https://www.womeninmining.org.uk/wp-content/uploads/2024/11/WIM100-2024-Book_Sixth-Edition.pdf). This award celebrates the accomplishments of women leaders in the mining industry. We both were distinguished as trailblazers and recognized for significant impact in research, innovation, and leadership.

I am a Professional Engineer of Ontario, and I remain an active member of key professional societies, including the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) and Prospectors & Developers Association of Canada, and an executive member of the Maintenance, Engineering and Reliability Society. I am also a core member of the Ingenuity Labs and a member of the Canadian Mining Schools Committee and the International Committee on Mine Safety Science and Engineering.•

Farzaneh Sadri, PhD
Assistant Professor

I joined the Robert M. Buchan Department of Mining Engineering at Queen's University in October 2023, where I have been building a research program focused on developing cleaner, more efficient methods for extracting and recovering critical metals. Before that, I spent a year as an Assistant Professor at the University of Alberta and then returned to Ontario to establish the Hydrometallurgy Research Group at Queen's, an interdisciplinary team working at the intersection of chemistry, materials science, and environmental sustainability.

In 2025, I was appointed as a Tier II Canada Research Chair (CRC) in Chemical Extraction of Critical Metals, which has allowed me to strengthen my research efforts on sustainable hydrometallurgical processes for metal extraction, separation, and recovery. My group's research covers a broad range of topics, from mineral processing and solution chemistry to recovering valuable elements from industrial residues and end-of-life products. Our overarching goal is to combine scientific understanding with practical solutions that support responsible resource development and Canada's transition toward a low-carbon future.

A key focus of my current work involves the pretreatment and hydrometallurgical extraction of rare earth elements (REEs) from both ores and waste permanent magnets. Together with my colleague, Christopher Pickles, I also lead collaborative projects exploring microwave-assisted processes and how they can improve metal recovery from REE ores, copper porphyry ores, gold ores, and polymetallic nodules. These projects are supported by national

funding programs such as the NSERC Alliance Missions and RTI grants, forming part of a larger departmental effort to integrate advanced technologies into mining and metallurgical research. My research group is also investigating industrially centred projects that address current challenges in the recovery of lithium, nickel, manganese, and cobalt from spent batteries, as well as magnesium extraction from dolomite, all of which reflect my commitment to advancing the field through close collaboration with industrial partners and industry-relevant research.

What I value most about my research group is its inclusive and mentoring-focused culture. When I started in 2024, there were just four of us: myself, a postdoctoral fellow, a research assistant, and an undergraduate student. Today, the team has grown to twelve researchers, ranging from undergraduate students to postdoctoral fellows. Undergraduates are often less involved in research at the university level, yet they bring remarkable energy and curiosity when given the chance. It is my vision to engage them early, spark their interest in extractive metallurgy, and train the next generation of hydrometallurgists: a highly sought-after expertise in today's mining and metals industries, where experienced professionals are few but in high demand. By maintaining a balanced team and encouraging mentorship between members, I strive to create a collaborative environment where discovery, learning, and leadership flourish.

Teaching is also a central part of my academic life. I currently teach five courses at Queen's: MINE 201 (Introduction to Mining and Mineral Processing), MINE 267 (Applied Chemistry for Mining), MINE 268 (Analytical Methods in Mining-Lab), APSC 132 (Chemistry of Natural and Engineering Systems), and MINE 821 (Hydrometallurgy and Electrometallurgy: Theory and Practice).

Looking ahead, I hope to continue expanding collaborations with both industry and academia, strengthening Canada's capacity in sustainable mining and metallurgy. My goal is to develop science-driven, practical solutions that make metal extraction cleaner and more responsible, helping Canada remain a leader in critical-metal recovery and green technologies.•

Abbas Taheri, PhD
Associate Professor and Chair in Mine Design

The GeoMechanics Laboratory has recently upgraded its existing rock mechanics facilities with funding from the Canada Foundation for Innovation. The new equipment includes an advanced high-pressure triaxial compression test system and a comprehensive direct shear test system, both capable of applying complex stress paths to rock and discontinuities while precisely measuring their mechanical responses. These state-of-the-art material testing systems will enhance the existing capacity to conduct quantitative and fundamental studies on the mechanical behaviour of rocks and rock masses in underground environments, offering valuable insights into the elemental characterization and stability of geological materials.

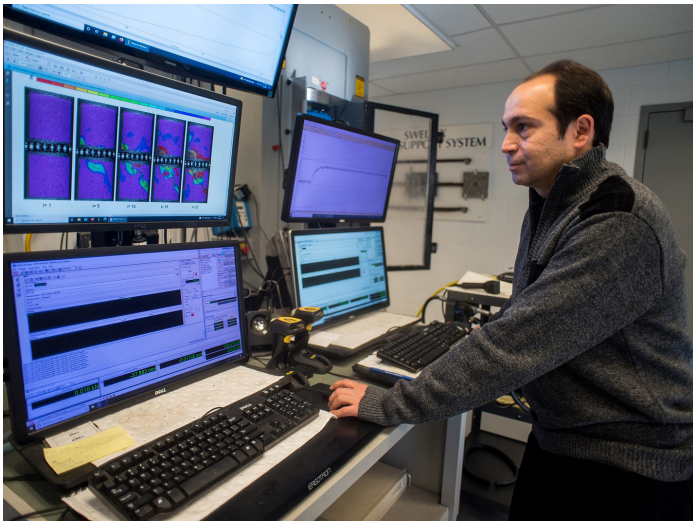
The GeoMechanics Laboratory has also secured multiple NSERC Alliance and Mitacs research grants in collaboration with leading industry partners, including Mining One, Lake Shore Gold, Vale Base Metals, Normet, BGC, Rocscience, and government organizations, including CanmetMining and RMC. These projects address urgent challenges in underground mining, including mine stability in complex geological conditions, rockburst prediction, and the performance of dynamic rock bolts. Specific research topics include the simulation and performance analysis of self-drilling dynamic bolts in deep underground mines, the advanced characterization of foliated rock masses in deep mining operations, and the development of constitutive models for high-stress mine environments. The work involves laboratory-scale advanced testing, field investigations, numerical simulations, and machine learning applications to improve understanding and safety in deep mining activities.

With this recent funding success, the GeoMechanics Laboratory has expanded its research team to 13 graduate and postdoctoral researchers, including one postdoc and a PhD student expected to join in January 2026. It continues to attract outstanding talent to support these exciting initiatives.

I chair the Deep Mining Commission within the International Society for Rock Mechanics and Rock Engineering (ISRM), organized and presided over the Deep Mining Geomechanics Workshop during the RaSiM11 conference, a major international event that attracted wide

participation from academia and industry. The team also presented papers at 2025 Annual general Meeting of the Society of Mining Professors (SOMP) and RocEng 2025. During the SOMP meeting, I participated in a panel discussion on sustainable mining, exchanging ideas with global leaders about challenges and opportunities shaping the future of the mining industry.•

Below: *Dr. Abbas Taheri*



Anne Johnson, PhD
Assistant Professor

In 2025, I have worked on research on gender differences in career progression and inclusion, focusing on the impact of parenthood on the recruitment and retention of women in the mining industry. I am co-investigator in a recent SSHRC Insight grant application that plans to explore identify catalysts/barriers to business model innovation and to explore policy levers that could facilitate the emergence of new and agile models to increase metal supply, and participation in the industry.

In addition to the core undergraduate course on Sustainability, MINE 422, I teach three courses in the Graduate Diploma in Social Performance Management: MINE 801, MINE 803 and MINE 804. I also teach the Sustainability Module in EERL 801, in the Master of Earth and Energy Resources Leadership Program. From time to time, I teach BTECH courses MNTC 310 Mining and Society and MNTC 418 Environmental Sustainability.

I serve as the Chair of CIM's Mining Schools Committee and represents Canada's university mining programs as an elected Board Member of the Mining Industry Human Resource Council (MiHR), which has developed programs to attract students to mining and has worked with Employment and Social Development Canada (ESDC) to provide scholarships for mining students. At Queen's, I sit on the General Research Ethics Review Board and on the Indigenous Knowledge, Curriculum and Research Working Group. I am the Co-ordinator of the Master of Engineering program in Mining and have recently taken on the role of Undergraduate Chair.•

Qian Zhang, PhD
Assistant Professor

I have built my academic career around bridging sustainable resource engineering, life-cycle assessment, and data-driven decision-making in the mining & minerals sector. My group focuses on three key research themes: 1) carbon accounting and decarbonization pathways, 2) material flow analysis (MFA) and life-cycle assessment (LCA) to evaluate eco-efficiency, and 3) mining firms' sustainability reporting and disclosure. Our work in carbon accounting enhances the industry's ability to measure emissions, track decarbonization progress, and align with global climate targets. Through MFA-LCA, we promote a systems-based approach to uncover hidden emissions in material cycles and material use. Recognizing the broader role of mining in sustainable development, we

Below: *Dr. Qian Zhang's research group*

contribute to impact assessment methodologies and tools that balance climate action with economic and social considerations, enhancing responsible resource extraction with informed decision-making. I am currently leading NSERC-funded projects that explore how mine waste and by-products can be transformed into valuable materials for construction and carbon sequestration, contributing simultaneously to carbon emission reduction and resource circularity. I also work on developing integrated frameworks that connect process simulation with life-cycle assessment and techno-economic evaluation to support the transition toward net-zero mining. This interdisciplinary approach allows me to engage with complex questions at the intersection of engineering science, sustainability policy, and digital transformation.

My teaching philosophy is to ensure that mining students not only master engineering fundamentals but also develop the ability to apply them in addressing real-world sustainability challenges in mining. In my courses MINE 431 Life-cycle assessment for green technologies and MINE 330 Mineral Industry Economics, I connect the principles of sustainability with various engineering applications to help students analyze the environmental and economic implications of mining operations across the entire value chain—from resource extraction to waste management and product use. I also incorporate case studies inspired by my ongoing research and industry collaborations, covering topics such as mine waste valorization, low-carbon process innovation, and circular economy strategies. By emphasizing experiential learning through student-led research projects, I aim to sharpen students' critical thinking, interdisciplinary teamwork, and professional readiness. I also teach MINE 326 Operations Research by emphasizing hands-on problem-solving experience on simulation exercises to solve optimization questions in mining contexts. I take pride in seeing my students pursue careers where they apply both technical expertise and systems thinking to create more sustainable and resilient mining operations.

Beyond my research and teaching, I am deeply committed to engaging with our professional alumni community. I welcome opportunities to connect through guest lectures, technical workshops, joint research, and training initiatives. By fostering collaboration between academia and industry, I hope to strengthen our shared capacity for innovation and contribute to shaping a more sustainable and forward-looking future for the mining sector.•

Takis Katsabanis, PhD
Associate Professor

Dr. Katsabanis has been on a a well-deserved administrative leave during 2025. Despite this, he continued to make significant contributions to the department. Earlier in the year, he played a key leadership role in guiding the department through the Canadian Engineering Accreditation Board (CEAB) visitation and evaluation process — an important milestone that ensures the continued accreditation and high standards of the program.

In addition, Dr. Katsabanis remained actively engaged in academic activities. He provided valuable support to the department and co-taught MINE 321 – Drilling & Blasting alongside Oscar Rielo, sharing his extensive expertise and practical knowledge with students. His dedication to both the academic and administrative aspects of the department has been greatly appreciated.•

MESSAGE FROM THE MANAGER & STAFF

Heather Drouillard
Department Manager

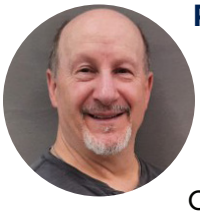
Hello Queen's Miner Readers! I would like to introduce myself as the relatively new Department Manager for the Robert M. Buchan Department of Mining. I joined this extraordinary department in July 2023. With over 25 years' experience at both Queen's University and the University of Toronto, I look forward to applying my background in administration, operations, finance, and human resources management in this evolving role. Recent changes have created an opportunity to review our processes and identify where we can work differently or develop innovative solutions to further enhance departmental operations, alongside the excellent support we provide our students. I look forward to enhancing teaching and research experiences for students and welcome any comments or feedback. I would also like to acknowledge the incredible staff in our department and thank everyone who helped ensure a smooth transition into my role.•

Oscar Rielo
Senior Program Coordinator

With over two decades of experience in engineering and technology development, Oscar Rielo is a Senior Program Coordinator, Technical Lead, and Adjunct Faculty member in the department. He teaches and develops hands-on courses in instrumentation, automation, and robotics, bridging theory and practice. Oscar also mentors undergraduate and graduate students, fostering collaborative learning environments that prepare them to lead and make a difference.•

Jenny Cruz
Online Program Coordinator

Jenny Cruz is the Online Program Coordinator at the Robert M. Buchan Department of Mining at Queen's University. Since joining the department in 2020, she has overseen all aspects of the online programs and manages the department's social media presence. Outside of work, Jenny enjoys spending time with her family, reading a good book, and savoring a cup of coffee.•



Perry Ross
Testing Operator

Perry came to the Department in 2009. With a background in electronics, Perry's role is to conduct various tests on Rock Cores, in order to ascertain the properties of the rock. The data acquired from testing is reported to mining companies, and mining consultants, to aid them with the development of the Mine..•

Larry Steele
Mining Engineering Technician

Larry Steel is the mining engineering and explosives technician. He works with the undergrad students, graduate students and any research where his services are required. Larry came to the department in 2012 after working in healthcare and emergency services. Before that, he had worked in a hydraulics and heavy truck shop for 10 years.•

Sharon Siderius
Undergraduate Program Assistant

Sharon Siderius has been part of the Robert M. Buchan Department of Mining since August 2023, moving from a temporary Financial & Administrative Assistant to Undergraduate Program Assistant in February 2024. With a background in executive and office administration, she provides daily support for the undergraduate program, assisting students with degree requirements, course planning, registration, and advising, as well as supporting student records and departmental activities. She holds a Bachelor of Social Work and a Diploma in Office Administration, and enjoys spending time with family and gardening.•

Araceli Zapata Perez
Graduate Program Assistant

Joining the department as a Graduate Assistant in February 2024, Araceli Zapata Perez (Ara) is a resourceful team player with a strong administrative background. She earned a double Master of Business Administration from the University of the Valley of Mexico and the European University of Madrid. Ara is passionate about helping others, delivering excellent client service, and advancing diversity and inclusion.•

Blendi Çuli
Mineral Processing Technologist

Joining the department in 2023, Blendi Çuli serves as the Mineral Processing Technologist playing a vital role in supporting laboratory instruction, research, and student learning. With a strong background in mineral processing and engineering technology, Blendi oversees the operation, maintenance, and safety of the facilities used by both undergraduate and graduate students.•

Catherine Landon
Administrative Assistant

With over 20 years of administrative experience at Queen's University, Catherine joined the Mining Department in October 2023. Her primary role is providing Human Resources support for hiring Teaching Assistants, Teaching Fellows, and Term Adjuncts, and assisting faculty with Research Assistants, casual staff, and Postdoctoral Fellows, while also serving as the department's travel resource. She runs a monthly student social, often bringing homemade treats. In her spare time, Catherine enjoys reading, puzzles, hiking, and time with her four-legged companions.•

QUEEN'S MINING ADVISORY BOARD

In March 2025, the Robert M. Buchan Department of Mining established its Queen's Mining Advisory Board (QMAB). The objective of the QMAB is to provide advice and support to the Robert M. Buchan Department of Mining in achieving the excellence in education, research, service and fundraising activities of the department.

QMAB members include:

1 Robert M. Buchan (Honorary Chair)
2 Colin Webster (Alamos Gold Inc)
3 Julia Gartley (BBA Consultants)
4 Roy Slack (Cementation Americas)
5 Ian Lipchak (Dundee Precious Metals)
6 Michael Anderson (Baffinland)
7 Patrick Murphy (Sandvik)
8 Michelle Moore (Agnico Eagle) joined the QMAB in October 2025.

Pictured in order to the right. •

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THREE DEPARTMENT ICONS RETIRE FROM QUEEN'S UNIVERSITY

Laeeque K. Daneshmend, PhD
by Oscar Rielo

When Dr. Laeeque K. Daneshmend retired from Queen's University, he left behind far more than a distinguished research record he left a legacy of compassion, mentorship, and community. A name synonymous with innovation in mining automation and reliability engineering, Dr. Daneshmend is equally remembered by colleagues and students for his kindness, humility, and genuine care for people.

Dr. Daneshmend's academic path began in the United Kingdom, where he earned his B.Sc. (Honours) in Electronic Engineering from the University of Southampton. He later completed a Ph.D. in Mechanical Engineering at Imperial College London, specializing in robotics and intelligent systems. His early research included collaborations with NASA's Jet Propulsion Laboratory, the Canadian Space Agency, and MDRobotics, contributing to the field of space robotics.

That same spirit of technological curiosity led him to apply automation and intelligent control to mining systems a transition that would define much of his career at Queen's University.

At Queen's, Dr. Daneshmend held the Noranda-Falconbridge Chair in Mine-Mechanical Engineering within the Robert M. Buchan Department of Mining. His work bridged mechanical systems, data analytics, and reliability modeling, helping shape how the mining industry understands maintenance, safety, and equipment performance.

Beyond research, Dr. Daneshmend also served as Deputy Provost, where he championed initiatives promoting equity, human rights, and accessibility. He has presented numerous awards that celebrate inclusivity and community service causes he cared deeply about.

Dr. Daneshmend's career was marked by intellectual depth and practical impact. He co-founded Aquila Mining Systems Ltd., a company that developed intelligent automation systems for open-pit mining equipment. Aquila's success led to its acquisition by Caterpillar Inc., and its technology continues to influence modern mining operations.

His research in reliability-based design, condition-based maintenance, and equipment health monitoring remains widely cited in mining engineering literature. One of his notable papers, "Reliability Modeling of Surface Mining Equipment: Data Gathering and Analysis Methodologies", continues to guide both researchers and industry professionals.

To his students, Dr. Daneshmend was more than a professor he was a mentor who truly cared. His lectures were engaging, infused with real-world insight and humor that made complex topics approachable.

He was known for his open-door policy and personal commitment to student success. Whether helping a struggling undergraduate understand reliability analysis or guiding a graduate student through a research challenge, he offered patience, wisdom, and encouragement

Dr. Daneshmend's compassion extended beyond the classroom. He consistently reminded his students that engineering is not only about machines or algorithms, but about people. Through his administrative work, he promoted initiatives celebrating diversity, inclusion, and accessibility aligning technical progress with social responsibility. Colleagues describe him as a leader who balanced excellence with empathy, rigor with humanity.

Even in retirement, Dr. Daneshmend continues to inspire through his mentorship at the Creative Destruction Lab, where he guides startups in mining technology and artificial intelligence. His wisdom continues to influence the next generation of innovators those who view engineering as both a science and a service.

As colleagues and students celebrated his retirement, they did not simply mark the end of a career they celebrated a life devoted to innovation, teaching, and kindness.

Dr. Laeeque K. Daneshmend's legacy at Queen's University is one of intellect and heart — a rare blend of scientific brilliance and human warmth that continues to inspire the Queen's community.•

Pyrometallurgy cake for Dr. Pickles

Dr. Chris Pickle's retirement party

Christopher Pickles, PhD

Dr. Chris Pickles did his B.A.Sc., M.A.Sc., and Ph.D. degrees in the Department of Metallurgy and Materials Science at the University of Toronto. Subsequently, he did post-doc research for five years and obtained a Faculty position in the Department of Metallurgy in Nicol Hall at Queen's University in 1983. Here he established a pyrometallurgical research group that was focused on the refining of metals, the processing of wastes such as electric arc furnace dust, lead-acid battery residue and slags. Chris contributed to the administrative duties of the Department in a number of ways such as as Undergraduate and Graduate chairs. His major teaching duties were two undergraduate courses on metallurgical thermodynamics, and an undergraduate course on pyrometallurgy. The Department transitioned towards materials and in 1998 it effectively closed. Chris requested to be transferred to the Mining Department and here he taught chemistry for mining engineers and a pyrometallurgy/hydrometallurgy course for students in the mineral processing option. Again, he was Undergraduate Chair and Graduate chair. He was also the Chair of Graduate Council for FEAS. His research transitioned somewhat from the processing of metals to the processing of minerals. He was known for trying to come up with everyday analogies to illustrate some principles, particularly with respect to thermodynamics. Perhaps, one of the most well-known is "Life is a metastable state". Due to the low numbers in the mineral processing option and consequently the courses, and the interest from Chem. Eng. and Eng. Chem a mineral processing stream was created in these two Departments. This resulted in a dramatic increase in the number of students in the mineral processing courses.•

Sadan Kelebek, PhD
Mineral Processing Technologist

Dr. Sadan Kelebek retired as a Professor of Mineral Processing from Queen's in 2025. He has been a faculty member in the Robert M. Buchan Department of Mining since 1997, being responsible mainly for 6 courses offered over the years to undergraduates in the 2nd, 3rd, and 4th years as well as at the graduate level. He has also been preparing pre-requisite exams for membership applicants to the PEO in Mill Design and Operations, and Mining and the Environment.

He obtained his MS & PhD degrees from McGill University following his BS degree from Istanbul University. His PhD thesis was awarded a second place in the CIM competition in 1985. After a few years of PDF research experience at McGill & at the Fuel Processing Labs, Alberta, he started his industrial career at the Falconbridge Met. Tech. Centre in process development, serving Ni-Cu & Zn-Cu operations. He was the chief metallurgist at the concentrate production facility, Strathcona prior to returning to the academia at Queen's. His main research interests are in mineral processing and the associated surface chemistry of minerals in flotation processes and in the mining environment. Over the years his research activities contributed to innovations in the Canadian Mining & Minerals Industry as recognized in Golden Anniversary of COM, 2011 (CIM/Met.Soc.). While processing issues of problematic sulphide ores continue as the main area of expertise, his research has involved physical and chemical processing of gold ores, desulphurization of gold cyanidation tails and more recently non-metallics, rare earths and graphite together with recycling from spent Co-Ni bearing Lithium-ion batteries.

He has two patents to his credit, implemented in industrial practice for several decades. He has authored or co-authored more than 75 publications in the form of journal, conference papers as well as technical reports. He has served as Chair of the Minerals Engineering Section of the Metallurgical Society/Canadian Institute of Mining and Metallurgy (one term) and as Associate Editor of Canadian Metallurgical Quarterly (nearly 20 years). He has been listed in the top 2% of researchers globally, as heralded by Prof. Pickles, his dear next-door neighbor for years.•

FACULTY AWARDS & RECOGNITIONS

Dr. Farzaneh Sadri named a Tier 2 Canada Research Chair in Chemical Extraction of Critical Metals

The Canada Research Chairs (CRC) Program invests over $311 million annually to support 2,285 research professorships that strengthen Canada's leadership in research and innovation. As the Canada Research Chair in Chemical Extraction of Critical Metals, Dr. Farzaneh Sadri is advancing the sustainable hydrometallurgical processes for recovering critical metals, such as rare earths, copper, and lithium, from ores, mining wastes, and end-of-life products like lithium-ion batteries. These metals are crucial for technologies such as smartphones and electric vehicles. Her research focuses on environmentally friendly extraction methods from sources like waste batteries, waste magnets, rare earth element ores and lithium brines. Her work addresses the growing global demand for these essential materials while reducing environmental impacts and improving supply chain resilience.•

Dr. Abbas Taheri received the Springer Nature Editor Distinction Award 2025 and recognition as one of the World's Leading Geomechanics Scholars

In recognition of his outstanding service as an Associate Editor for the International Journal of Geological and Geotechnical Engineering, Dr. Abbas Taheri had received the Springer Nature Editor Distinction Award. This award recognizes his exceptional editorial contributions, dedication to maintaining high scientific standards, and commitment to advancing research in geotechnical and geological engineering.

Excellence in Research - ScholarGPS have recognized Dr. Abbas Taheri as one of the world's top scholars for exceptional research contributions across multiple disciplines. In 2025, he was ranked #19 globally in Geotechnics (and #1 in Canada) and #35 globally in Rock Mechanics (and #2 in Canada) based on scholarly performance between 2018 and 2023. ScholarGPS is a global analytics platform that assesses scholars

Dr. Panagiotis (Takis) Katsabanis receives the award at the ceremony at Queen's University.

Dr. Chris Pickles' receives the 2025 MetSoc Silver Medal Award

and institutions using comprehensive metrics of productivity, impact, and collaboration across all academic disciplines. Its rankings are based on an extensive database of peer-reviewed publications and citations, providing an independent, data-driven measure of scholarly excellence. Dr. Taheri's inclusion among the top-ranked researchers highlights his leadership and ongoing contributions to advancing geomechanics.•

Dr. Panagiotis (Takis) Katsabanis recognized with the 2025 Distinguished Service Award by Queen's University

An Associate Professor in the Robert M. Buchan Department of Mining, Dr. Takis Katsabanis has devoted more than 37 years to Queen's. A leader in engineering education, he developed a fully online Bachelor of Mining Engineering Technology program that expanded access and innovation. He has also helped guide departmental transitions, led accreditation reviews, and managed unique research facilities, all while being a committed mentor. His work has significantly enhanced Queen's international reputation, strengthened its academic programs, and supported the success of the broader university community.•

Dr. Charlotte Gibson recognized with the Winter 2025 Undergraduate Research Mentorship Award

This is the inaugural year for the Undergraduate Research Mentorship Award. This award is meant to honour the contributions of professors that have encouraged undergraduate research at Queen's. This comes in many forms, such as thesis supervision, inquiry projects in the classroom, or supervising a capstone project. This is an initiative to recognize excellent mentorship of undergraduate scholars at Queen's University.•

Dr. Chris Pickles' receives the 2025 MetSoc Silver Medal Award

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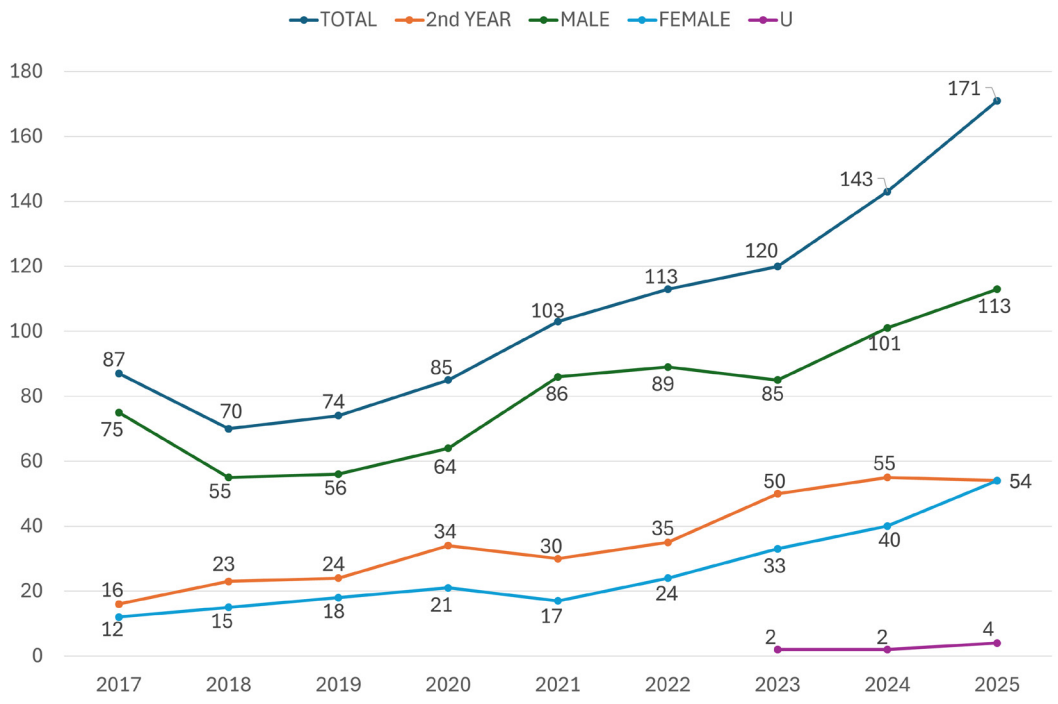
UNDERGRADUATE STUDENT ENROLLMENT

Queen's Mining Engineering program has experienced remarkable growth over the past several years and now stands as the largest mining engineering program in North America in terms of student enrollment. This growth reflects both the increasing interest in the field and the program's strong reputation for academic excellence, industry connections, and hands-on learning opportunities.

In Fall 2017, the program had a 2nd-year cohort of just 16 students. By Fall 2025, that number had more than tripled to 54 students, demonstrating a sustained upward trend in student demand. Overall enrollment, which includes students in 2nd through 4th year as well as those participating in internship placements, has also grown substantially—from a total of 87 students in 2017 to 171 students in 2025.

This significant increase highlights the success of Queen's Mining in attracting top talent and preparing graduates to meet the evolving challenges of the global mining industry. The program's expansion also underscores the strength of its curriculum, the dedication of its faculty, and the value placed on experiential learning and industry engagement.•



DEPARTMENT ACTIVITIES

A HOMECOMING OF INSPIRATION: ROBERT M. BUCHAN RETURNS TO QUEEN'S

The Robert M. Buchan Department of Mining at Queen's University recently welcomed back the industry leader whose name it proudly carries. Robert M. Buchan, renowned mining engineer, entrepreneur, and philanthropist, returned to campus for an engaging conversation with mining students.

Energy filled the room as students gathered to hear from a figure whose impact spans both the global mining sector and mining education at Queen's. From his first words, Mr. Buchan held the audience's attention with candid reflections on his career and his commitment to supporting future mining professionals.

Students eagerly posed questions, and Mr. Buchan responded with openness and practical insight. He shared guidance on navigating the industry, lessons learned while building major resource companies, and perspectives on leadership. He emphasized the growing importance of sustainability and responsible development of mineral resources.

Mr. Buchan's journey began in Scotland, where he earned a first-class honours degree in Mining Engineering from Heriot-Watt University in 1969. After completing his master's degree at Queen's, he launched a remarkable career that included founding Kinross Gold Corporation in 1993 and guiding it into one of North America's leading gold producers. His influence has continued through his involvement in the development of several major mining companies.

His philanthropy has been equally transformative. His landmark gift to Queen's established the Robert M. Buchan Department of Mining, enhancing the university's global profile and expanding opportunities for students. In Scotland, his support created the Robert M. Buchan Chair in Sustainable Energy Engineering at Heriot-Watt and advanced renewable energy research. He also served as Chancellor of Heriot-Watt University, promoting education and international collaboration.

One message resonated throughout his talk: Mr. Buchan's strong belief in the potential of Queen's mining students. His dedication to responsible resource development is matched by his commitment to empowering the next generation of industry leaders.

For the students in attendance, his return was more than a homecoming, it was a powerful reminder of what vision, determination, and generosity can achieve.•

MINING TRIPS

In March of this year, our senior mining engineering students participated in an intensive week-long professional field trip to the United States, designed to expose them to large-scale mining operations and cutting-edge technologies. Their itinerary included visits to Nevada Gold Mines, one of the world's largest gold mining complexes, where students gained firsthand insight into modern open-pit and underground mining practices, sustainable operations, and advanced ore processing systems. They also toured the Epiroc Surface Mining Automation Center, where they observed state-of-the-art autonomous drilling and haulage technologies shaping the future of mining, as well as the FLSmidth laboratories, where they explored innovative mineral processing solutions and testing facilities.

Meanwhile, our second-year students took part in a series of educational site visits across Ontario's Timmins and Sudbury mining regions—two of Canada's most historically and economically significant mining hubs. These excursions provided opportunities to observe both surface and underground mining operations, as well as mineral processing plants, allowing students to connect classroom theory with real-world industrial applications. The visits to original equipment manufacturers (OEMs) further deepened their understanding of modern mining machinery, safety standards, and automation trends.

In addition, our MASc, MEng, and PhD students embarked on a specialized field trip to the Havelock area, where they visited an industrial minerals mine and processing plant. This experience enabled graduate students to engage directly with industry professionals and discuss current challenges and innovations in industrial minerals production.

Collectively, these field experiences provided invaluable hands-on learning opportunities for all participants, reinforcing theoretical knowledge through practical exposure, and strengthening the connection between our students and the mining industry.•


655
30 MINUTE PARKING


I MAKE POUR DECISIONS

MINING DISCIPLINE NIGHT

...A TOTAL SUCCESS!

Mining Discipline Night 2025 was a total success. Walter Light Auditorium was full of first-year students, where speakers Charlotte Gibson, the Associate Head of the Mining Department, Mining Undergraduate students Jasdip Mann and Lisa du Plessis, and Queen's Mining Alumni Christopher Cavasin from Nevada Gold Mine discussed their experience in Mining, and what a career in Mining offers. After that, students had a guided tour of Mineral Processing, Rock Mechanics, Virtual Reality, and Robotics. Then, there was an Industry Fair and pizza in Beamish Munroe Atrium. Thank you to the attendees and everyone who made it possible. We look forward to welcoming future Mining Engineering students to the Department.•


NEVADA

MINING PATHWAYS 2025

Our annual Mining Pathways 2025 event was an outstanding success, drawing an impressive lineup of leading mining companies to our department. Representatives from Canadian Natural Resources Limited, Agnico Eagle Mines, Elk Valley Resources, Kinross Gold, Suncor Energy, and Vale joined us to engage directly with students and faculty, highlighting the strong and ongoing connections between our department and the mining industry.

The event provided a valuable platform for students to network with industry professionals, learn about diverse career paths, and gain insight into the latest innovations, sustainability practices, and technological advancements shaping the mining sector. Informal discussions and structured networking sessions allowed students to explore potential co-op, internship, and full-time opportunities while receiving firsthand advice from experienced engineers and managers.

A highlight of the evening was the pair of inspiring keynote presentations. Michelle Moore, General Manager of Detour Lake Mine at Agnico Eagle Mines Limited, delivered an engaging talk that reflected on her leadership journey, the challenges and rewards of managing one of Canada's gold operations, and the importance of resilience and mentorship in advancing one's career. Tyler Crary from SGS Canada talked about a global perspective on mineral processing, sharing insights from his international work and underscoring the vital role of technical excellence, innovation, and collaboration in driving the industry forward.

We extend our sincere gratitude to all participating companies, guest speakers, and attendees for making Mining Pathways 2025 such a memorable and impactful event. Their contributions help inspire and empower the next generation of mining engineers, ensuring a bright and sustainable future for the industry.•


Any Questions?
Tyler Crary, P.Eng.
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Metallurgy & Consulting
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SGS Canada Inc.
185 Concession Street, Box 4300
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SGS


STUDENT ROLES & INDUSTRY EXPECTATIONS
SGS
Metallurgy & Consulting

Don Lindsay with the recipients of the Lindsay Teck Award

DON LINDSAY AND TECK REPRESENTATIVES VISIT QUEEN'S MINING STUDENTS AND FACULTY

The Robert M. Buchan Department of Mining was pleased to welcome Don Lindsay, former CEO of Teck, along with Jacquelyn van Os (Business Planning & Evaluations, Teck) and Masaki Miyoshi (Lead, Campus Talent Acquisition, Teck) back to Queen's University.

During the visit, Mr. Lindsay reflected on his distinguished career—from global investment banking, to more than 17 years as President & CEO of Teck Resources Limited, to his current roles as Chair of Manulife Financial Corporation and Director of BHP Group Limited. In his remarks, he highlighted the importance of combining academic excellence with a commitment to community and strong relationship-building.

Jacquelyn van Os met with members of Queen's Women in Mining to discuss Teck's strategic priorities and the company's ongoing efforts to drive innovation across the mining sector.

Mr. Lindsay and Teck support Queen's mining students through annual scholarships, and the department is deeply grateful for their generosity and sustained engagement.•

ALUMNI RECEPTION AT THE CIM EVENT

The department continued to strengthen its engagement with alumni and industry partners through participation in major mining conferences and networking events. This year, we proudly hosted alumni receptions at both the Prospectors & Developers Association of Canada (PDAC) Conference in Toronto and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Conference and Exhibition in Montreal—two of the most significant gatherings in the global mining calendar.

These events provided an excellent opportunity to reconnect with graduates working across diverse sectors of the mining industry, celebrate their professional accomplishments, and share updates on the department's ongoing initiatives, student successes, and strategic priorities. The receptions also fostered meaningful dialogue between faculty, alumni, and industry leaders, creating a space to discuss the evolving landscape of mineral resource development.

We are deeply grateful to all who attended and supported these gatherings. Their continued enthusiasm and engagement play a vital role in building a strong, connected, and forward-looking alumni community that contributes meaningfully to the advancement of the mining profession and to the success of our department.•

MINING'S SOCIAL RESPONSIBILITY EVENT

VISIT BY SHERI MEYERHOFFER TO MINE 422: MINING AND SUSTAINABILITY

Sheri Meyerhoffer is best known as the first Canadian Ombudsperson for Responsible Enterprise (CORE), a body tasked with reviewing human rights abuse allegations involving Canadian companies operating abroad, in the mining, oil and gas, and garment sectors. Prior to her 2019 appointment, Meyerhoffer was a lawyer with extensive experience in the upstream oil and gas industry and over a decade of international work in governance, rule of law, and human rights across numerous countries, including Nepal, India, and China. She also holds a JD from the University of Saskatchewan and a MPA from the Harvard Kennedy School: a unique background combining legal, resource sector, and international development expertise to address complex corporate accountability issues.

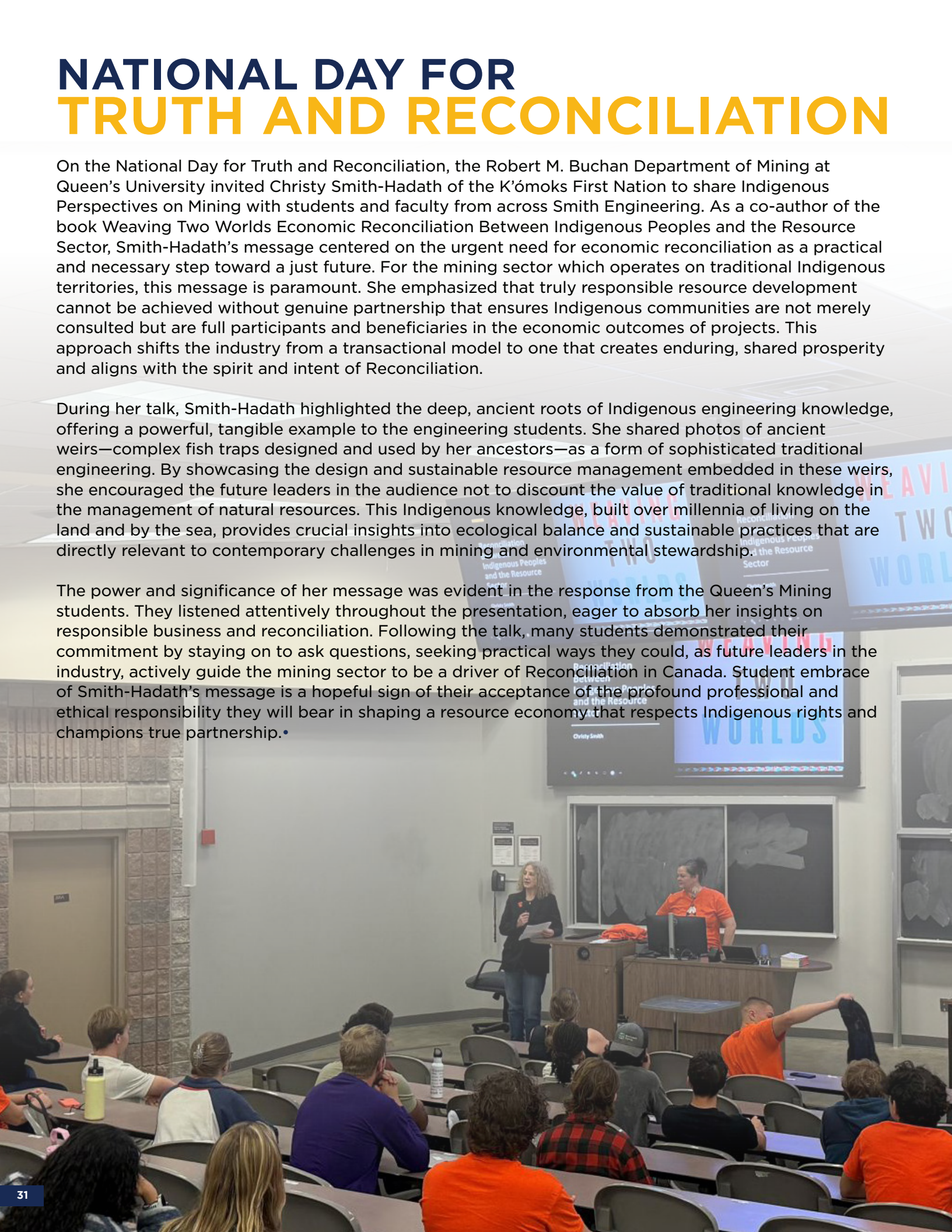
In an effort to engage future industry leaders, Meyerhoffer recently visited Kingston where she participated in a fireside-chat style discussion with the students in MINE 422: Mining and Sustainability. The discussion provided students, who are the next generation of mining professionals, with a direct and candid look at the CORE's work, including its mandate, challenges (such as the lack of powers to compel testimony), and its first investigations, like the one involving the Dynasty Gold mining company. The students of MINE 422 were highly engaged, demonstrating their growing awareness of human rights risks and their commitment to an evolving ethos of social responsibility. They drove the conversation with numerous, thoughtful questions, indicating a clear commitment to integrating human rights considerations into modern mining practices.•

NATIONAL DAY FOR TRUTH AND RECONCILIATION

On the National Day for Truth and Reconciliation, the Robert M. Buchan Department of Mining at Queen's University invited Christy Smith-Hadath of the K'ómoks First Nation to share Indigenous Perspectives on Mining with students and faculty from across Smith Engineering. As a co-author of the book Weaving Two Worlds Economic Reconciliation Between Indigenous Peoples and the Resource Sector, Smith-Hadath's message centered on the urgent need for economic reconciliation as a practical and necessary step toward a just future. For the mining sector which operates on traditional Indigenous territories, this message is paramount. She emphasized that truly responsible resource development cannot be achieved without genuine partnership that ensures Indigenous communities are not merely consulted but are full participants and beneficiaries in the economic outcomes of projects. This approach shifts the industry from a transactional model to one that creates enduring, shared prosperity and aligns with the spirit and intent of Reconciliation.

During her talk, Smith-Hadath highlighted the deep, ancient roots of Indigenous engineering knowledge, offering a powerful, tangible example to the engineering students. She shared photos of ancient weirs—complex fish traps designed and used by her ancestors—as a form of sophisticated traditional engineering. By showcasing the design and sustainable resource management embedded in these weirs, she encouraged the future leaders in the audience not to discount the value of traditional knowledge in the management of natural resources. This Indigenous knowledge, built over millennia of living on the land and by the sea, provides crucial insights into ecological balance and sustainable practices that are directly relevant to contemporary challenges in mining and environmental stewardship.

The power and significance of her message was evident in the response from the Queen's Mining students. They listened attentively throughout the presentation, eager to absorb her insights on responsible business and reconciliation. Following the talk, many students demonstrated their commitment by staying on to ask questions, seeking practical ways they could, as future leaders in the industry, actively guide the mining sector to be a driver of Reconciliation in Canada. Student embrace of Smith-Hadath's message is a hopeful sign of their acceptance of the profound professional and ethical responsibility they will bear in shaping a resource economy that respects Indigenous rights and champions true partnership.•



DEPARTMENT RETREAT

Our recent department retreat proved to be a highly productive event. Over the course of the retreat, faculty and staff engaged in meaningful discussions that addressed current challenges, explored emerging opportunities, and charted a strategic vision and actions for the future of our program. The spirit of collaboration and the exchange of fresh perspectives set a strong foundation for innovation and growth within the department.

We were pleased to welcome Dr. Nevena Martinović and Dr. Dale Lackeyram from the Queen's Centre for Teaching and Learning, whose expertise played an integral role in the retreat's success. They skillfully facilitated a series of interactive conversations focused on mining curriculum development, encouraging participants to think critically and creatively about the evolution of our academic offerings. Through these conversations and hands-on activities, Drs. Martinović and Lackeyram helped identify key areas for enhancement and provided insightful recommendations to guide our curriculum change process moving forward.

The retreat not only strengthened our collective sense of purpose but also reaffirmed our commitment to delivering a forward-looking, student-centered curriculum that reflects the evolving needs of the field. We look forward to building on the momentum generated during this retreat as we continue to innovate and grow together.•

INTERNATIONAL PARTNERSHIPS AND GLOBAL ENGAGEMENT

In recent months, we have been finalizing a Memorandum of Understanding (MoU) with the Universidad Nacional Mayor de San Marcos, the largest public university in Peru. This agreement aims to advance collaborative research and innovation in mining, while promoting student and faculty exchanges that foster academic and professional growth. As an early outcome of this partnership, our Peruvian colleagues will host a week-long field visit for our senior students in March 2026, providing them with first-hand exposure to surface and underground mining operations, as well as opportunities for academic collaboration with their mining engineering program.

The department is also developing a 2+2 articulation program with two universities in Scotland. Through this initiative, Scottish engineering students will complete their first two years at their home institutions before transferring to Queen's University to complete their third and fourth years in the mining program. The implementation of this program will expand Queen's international footprint in mining education and attract new cohorts of global talent to Kingston.

Beyond formal partnerships, the department continues to promote its academic programs and research excellence through invited lectures and presentations at leading mining schools across Latin America, Africa, Australia, and Europe. The Head of the Buchan Department of Mining, Dr. Vlad Kecojevic, has recently visited four universities in Peru — Universidad Nacional de Ingeniería, Universidad Nacional Mayor de San Marcos, Pontificia Universidad Católica del Perú, and Universidad ESAN. Additionally, Dr. Abbas Taheri and Dr. Kecojevic participated in the annual general meeting of the Society of Mining Professors held at RWTH Aachen University in Germany.•

Dr. Abbas Taheri attending the annual general meeting of the Society of Mining Professors in Aachen, Germany.

Presentation by Dr. Vlad Kecojevic to mining students at Universidad Nacional de Ingeniería, Peru.

Presentation by Dr. Vlad Kecojevic on opportunities for MASc, MEng, and PhD studies at Queen's University to mining students at Universidad Nacional Mayor de San Marcos, Peru.

Dr. Vlad Kecojevic participating in a panel discussion on redefining mining education in Aachen, Germany.

GRAD STUDENT REPORT

Alireza Gholami, Mining Engineering Graduate Association (MEGA)

It is a pleasure and a privilege to write on behalf of the graduate students of the Robert M. Buchan Department of Mining at Queen's University. Over the past year, our department has continued to grow, welcoming new faces, expanding research, and strengthening the connections that make this an inspiring place to study and work. The sense of collaboration between faculty, staff, and students is remarkable, creating an environment where ideas are shared freely and innovation thrives.

Our graduate students are contributing to this momentum through research that spans the full spectrum of mining engineering, including rock mechanics, mine design, mineral processing, extractive metallurgy, and resource optimization. Many are also advancing new directions in automation, digitalization, sustainability, and community engagement. These efforts reflect a department that values both technical excellence and forward-thinking innovation. What truly sets it apart is the genuine sense of community, with students and faculty working side by side, supporting one another, and turning ambitious ideas into meaningful outcomes.

Queen's Mining graduate students continue to shine wherever they go, sharing their research and earning recognition at leading conferences such as CIM Connect, the Conference of Metallurgists, the Canadian Rock Mechanics Symposium, and the Canadian Mineral Processors Conference, among others. Our students are consistently featured as presenters and award recipients, proudly showcasing the innovation, technical depth, and collaborative spirit that define the graduate community at Queen's Mining.

This year, we also established the Mining Engineering Graduate Association (MEGA), a student-led initiative that brings our graduate community together to share ideas, advocate for student needs, and showcase the outstanding research taking place within our department. Through MEGA, we are working closely with faculty and staff to organize professional development events, soft-skills workshops, and networking opportunities that connect us more meaningfully with industry and alumni.

Looking ahead, our goals are to strengthen these external relationships, enhance collaboration across research groups, and build an even stronger sense of community among graduate students. We also aim to create more platforms to highlight graduate research, celebrate student accomplishments, and foster mentorship opportunities between current students, alumni, and industry professionals. It is an exciting and inspiring time at Queen's Mining, where I am proud to be part of a department that nurtures ideas, builds lasting connections, and upholds excellence in mining engineering as both a tradition and a shared pursuit.•

Message From the Mining Society President, Rebecca Randall

Greetings,

It is my pleasure to write to you on behalf of the Queen's University Mining Society for the 2025-2026 academic year. As president, my objective is to ensure representation of the undergraduate community among broader mining departmental decision-making and to help provide students with the best possible experience that Queen's Mining has to offer. This year, with the help of my dedicated executive committee, we aim to achieve this through participation in intercollegiate competitions, attendance at industry events, professional development opportunities, and other initiatives for students.

Graduating approximately one-third of Canada's workforce in mining engineering and mineral processing, the Robert M. Buchan Department of Mining holds a unique and influential position in shaping the future of our industry. Ensuring both academic and professional growth opportunities is essential in assuring that we, as students, are well-prepared to enter the mining industry.

A key avenue to achieving this is our annual participation of our student teams at the Canadian Mining Games, the Goodman Gold Challenge, Mine Rescue Competition, and SME Student Design Competition. These opportunities allow our students to apply and refine their academic and technical skills through collaboration to solve real-world industry challenges in fast-paced, competitive environments. At the same time, they broaden their network with like-minded students and industry professionals from a variety of backgrounds. Beyond competitions, the Mining Society works closely with the mining department to organize and offer mine rescue training, transportation to various industry conferences, guest speakers, and industry field trips. These professional development opportunities are integral in providing a well-rounded experience for our students that adds value beyond the classroom.

Over my undergraduate career, Queen's Mining has experienced remarkable growth with the graduating class size increasing by over 60% since 2021. This progress has been driven by targeted recruiting, meaningful engagement with first-year students, and education initiatives, many of which are longstanding pillars of the Mining Society's annual agenda. We are proud of this momentum and are committed to maintaining this positive trajectory over the upcoming academic year.

On behalf of the Queen's Mining Society and the Robert M. Buchan Department of Mining, we extend our sincerest appreciation to our sponsors, both past and future. It is often through the generous support of Queen's Mining alumni that we are able to secure industry sponsorships and successfully carry out our initiatives. If you have any questions about our sponsorship process or if your company might be interested in supporting the Society, please do not hesitate to reach out to becca.randall@queensu.ca.•

2025/2026 Mining Society Executive Members

STUDENT ACTIVITIES

2025 SME Metallic Design Competition Team (Joel Zandvliet, Maxime Forest, Mathew Harrison, Jacob Hankai, and Nick Page)

SME Design Competitions

In February 2025, Queen's participated in the Society for Mining, Metallurgy and Exploration (SME) Metals Design Competition in Denver, Colorado. The team included Joel Zandvliet, Maxime Forest, Mathew Harrison, Jacob Hankai, and Nick Page. After qualifying through Phase 1, the team advanced to Phase 2, where they developed a comprehensive mine plan incorporating mine layout, processing flowsheets, and a detailed financial evaluation, which they then presented to a panel of industry judges. The experience proved highly rewarding, with team members taking full advantage of opportunities to network with engineering students from across North America.

Building on last year's success, Queen's is proud to return to the SME Metals Design Competition for 2026. This year's team is composed of Quinn Cooke, Matthew Harrison, Jack Scali, Grace Franklin, Cade Lemke, and Ethan Hodgkinson.

In addition to the returning Metals team, Queen's is excited to announce its inaugural entry in the NSSGA Aggregates Competition. This new team includes Alvaro Galvez Cueva, Clara Parkin, Colin Fraser, Jack Martin, Lauren Colaiacovo, and Rojella Santos.

Both teams worked tirelessly throughout November to complete Phase 1 of their projects and now await results, hopeful for qualification to Phase 2 at SME 2026 in Salt Lake City, Utah, this coming February.•

2026 SME Metallic Design Competition Team (Ethan, Cade, Grace, Quinn, Jack and Matthew)

2025 Goodman Gold Challenge Team

Goodman Gold Challenge Engagement

The Goodman Gold Challenge Team (Nicholas Pantis, Howie Wu, Alexander Arellano and Nathan Hrebicek) ended last year on a high note. After selecting the team of four presenting students in November 2024, the team dedicated itself to rigorous preparation for the stock pitch competition at Laurentian University in late January 2025. Given three mining companies to choose from, the team ultimately selected Meridian Mining for their pitch. Weeks of financial modeling and in-depth research paid off, as the team delivered a winning presentation before a panel of industry judges, including representatives from Dundee Corporation. Their hard work and strategic insights secured them first place in the competition, marking a tremendous achievement.

This year, the team, led by Joey Cuzzetto, will return to Sudbury in January, aiming to defend their title. Joining Joey as presenting members are Orissa Ghai, Evan Fingerhut, and Cole Bremner with Finn Goodall, Jasmine Haneberry and Clara Parkin supporting as shadows.

This year, the team, led by Joey Cuzzetto, will return to Sudbury in January, aiming to defend their title. Joining Joey as presenting members are Orissa Ghai, Evan Fingerhut, and Cole Bremner with Finn Goodall, Jasmine Haneberry and Clara Parkin supporting as shadows.•

2026 SME/NSSGA Design Team (L-R: Rojella, Lauren, Clara, Jack, Alvaro & Colin)

Participation at Conferences

In 2025, the Mining Society sent 50 students to the annual PDAC conference in Toronto. For many of our second-year students, this was their first experience at a major industry event. At the time, second year student Nick Page reflected on this experience, saying: “I was blown away by the size, energy, and friendliness of the mining community at PDAC. It made me proud and excited about the future I’m building in this industry.”

Additionally, students also attended the Canadian Mineral Processors Conference the first time in recent years that Queen’s students participated. This event was primarily attended by our mineral processing students, who appreciated the opportunity to connect with such a close-knit and passionate community of processing professionals.

This upcoming semester, the Mining Society is hoping to build on last year’s experience and once again will be supporting undergraduate student attendance at PDAC and CMP 2026.•

Dr. Charlotte Gibson and students Canadian Mineral Processers Conference

Canadian Mining Games

On March 6-9, 2025, the Queen's Mining Society sent a team of 16 students to compete at the 35th Annual Canadian Mining Games in Québec City. We are proud to bring back the third-place overall finish!

The Canadian Mining Games is a cumulative competition in which students from the Robert M. Buchan Department of Mining participate. Throughout the year, students garner support from mining companies to sponsor their efforts and run practices to prepare for their events. The weekend, hosted by Université Laval, was packed with competition, networking, and banquets where students met industry professionals and other mining engineering students from across Canada.

The Canadian Mining Games competition gives students a range of technical, presentation-based, and hands-on challenges to demonstrate their mining know-how and engineering problem-solving, all while working against the clock. The third-place overall finish and outstanding individual performances are both a testament to the Queen's Mining reputation and the well-roundedness of the team.

In addition to the many podium finishes, Women In Mining Canada awarded Sarah Glaspell-Elser with a scholarship for her performances at the competition and her future as a woman in mining.

2025 Team Members:

Theron Craig, Fin McInnes, Maxime Forest, Gavin Bhattacharya, Rebecca Randall, Joey Cuzzetto, Alexander Arellano, Nicholas Pantis, Logan Drane, Curtis Dewasha, Joel Zandvliet, Liam Bacon, Ryan Dailey, Chunxiao Wang, Sarah Glaspell-Elser, Lisa du Plessis

Podiums:

1st Place: Mechanical Design (Full Team)
1st Place: Commodity Trading (Nicholas Pantis & Fin McInnes)
1st Place: Mineral Economics (Nicholas Pantis & Fin McInnes)
1st Place: Health & Safety (Alexander Arellano & Nicholas Pantis)
1st Place: Open Pit Drill & Blast (Sarah Glaspell-Elser & Fin McInnes)
1st Place: Mine Rescue (Curtis Dewasha, Lisa du Plessis, Logan Drane, Maxime Forest, Fin McInnes)
3rd Place: Exam Package (Full Team)
3rd Place: Mineral Identification (Joel Zandvliet)

3rd Place: Tailings/Closure Management (Logan Drane & Maxime Forest)

In February 2026, Queen's is excited to compete at the 36th Annual Canadian Mining Games, hosted this year by the University of Saskatchewan. Earlier this fall, team captains Orissa Ghai and Joey Cuzzetto selected the roster, who will spend the coming months training and refining their skills to ensure they are competition-ready when they head to Saskatoon.

2026 Team Members:

Orissa Ghai, Joey Cuzzetto, Rebecca Randall, Brad Forsyth, Vince Verbaan, Cash Cuthbert, Aaron Nijjar, Fin Mcinnes, Meghan Davis, Logan Blower, Sapphire Flach, Cole Bremner, Nick Page, Nathan Hrebicek, Steven Towsey, Alexa Kormany, Avangelina Cvetan and Jasmine Haneberry.

Queen's Conference on Business and Mining

The Queen's Conference on Business and Mining is a two-day student-run conference held annually at Queen's to connect the business and mining sectors. QCBM offers students the chance to hear from industry leaders, network with established companies, and participate in a mining-finance case competition. This year, we are pleased to welcome back our title sponsor, TD Securities.

QCBM attracts 80 student delegates, largely from the mining engineering and commerce programs. In addition to these delegates, QCBM attracts industry professionals and companies to attend and connect with students. This includes companies such as the Canada Nickel Company, Dundee Precious Metals, Agnico Eagle, Kinross Gold, Vale, and Alamos Gold.

Last year, QCBM was proud to host incredible speakers from the mining and business industries, including Shaun Usmar, CEO of Vale Base Metals, Rick McCreary, former Deputy Chair of Investment Banking at TD, Paul Chawrun, COO at Centerra Gold, and Jackie Przybylowski, Vice President of Capital Markets at Gold Royalty Corp. Additionally, QCBM hosts a young professionals panel, where students are given the opportunity to connect with young professionals just beginning their careers in the mining industry.

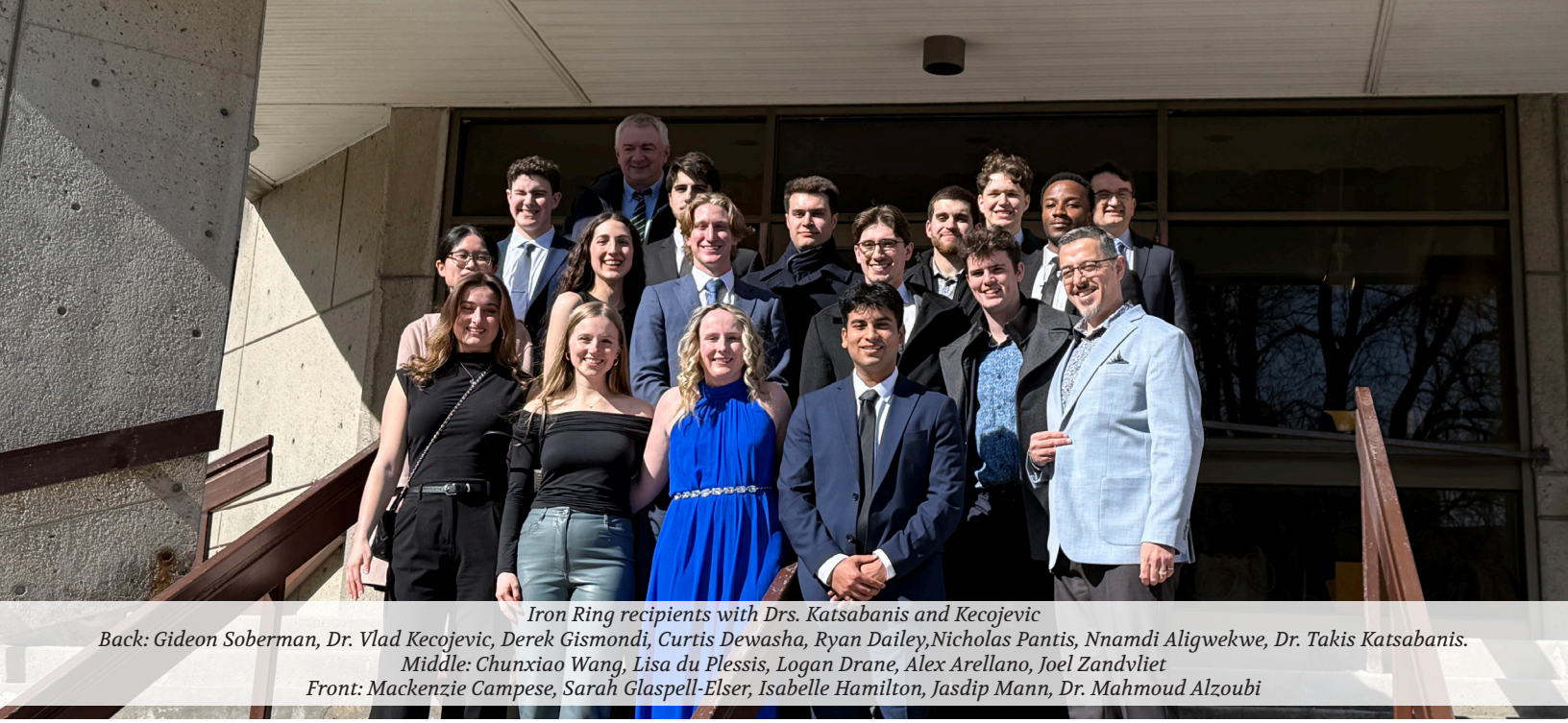
Beside is the schedule for QCBM 2026. This year, we are especially excited to be welcoming Anthony Vaccaro and the Northern Miner to QCBM, raffling off a gold coin to the delegates in attendance.

Friday: Offers a chance for students to connect with other students and network with professionals beginning their career journeys.

Saturday: Gives students a chance to hear from established industry professionals, test their skills against other students in the QCBM case competition, and discuss career opportunities with sponsors.

We're incredibly excited for QCBM this year. Please contact us if you have any questions, are interested in attending, or would like to sponsor QCBM. QCBM is always interested in connecting with Queen's Alumni as well as new companies in the industry and can be contacted at qcbm.exec@gmail.com.

Nicholas Page and Emma Abicht,
Co-Chairs for the Queen's Conference on Business and Mining



Iron Ring recipients with Drs. Katsabanis and Kecojevic
Back: Gideon Soberman, Dr. Vlad Kecojevic, Derek Gismondi, Curtis Dewasha, Ryan Dailey,Nicholas Pantis, Nnamdi Aligwekwe, Dr. Takis Katsabanis.
Middle: Chunxiao Wang, Lisa du Plessis, Logan Drane, Alex Arellano, Joel Zandvliet
Front: Mackenzie Campese, Sarah Glaspell-Elser, Isabelle Hamilton, Jasdip Mann, Dr. Mahmoud Alzoubi

Iron Ring 2025

On March 23, 2025, 870 final year engineering students participated in the Obligation Ceremony at Camp 3 Kingston, proudly accepting their Iron Rings in front of a crowd of more than 2,200 supporters, including family, friends, and fellow engineers.

Among those honored were members of our graduating class of 2025. This year's ceremony was especially significant, as it coincided with the centennial celebration of the very first Obligation Ceremony, which took place in Montreal in April 1925.

The graduating class received their iron rings together with Dr. Mahmoud Alzoubi who completed his graduate work at McGill university prior to becoming a professor at Queen's University. Dr. Takis Katsabanis had the honour to ring several of our students as well as Dr. Alzoubi. The iron ring is associated with the ethical commitments of engineering, it is unique to Canadian engineers and for students and their families it is a proud accomplishment.•

Welcoming Matthew Paris: Our First Bridging Student

We're excited to introduce Matthew Paris, the very first student to join our department through the brand-new Engineering Bridging Program. Matthew's roots in the mining industry run deep—mining isn't just a job in his family, it's a way of life. Growing up surrounded by this tradition, he's picked up firsthand knowledge of what makes the industry both challenging and rewarding.

Matthew started his academic journey at Cambrian College, where he graduated from the Mining Engineering Technology program in 2022. Since then, he's put his skills to work at Magna Mining and Vale, gaining valuable experience in both exploration and operations. His dedication hasn't gone unnoticed—he's earned scholarships from the Canadian Mining Innovation and Education Foundation as well as the Northern Ontario Families of Children with Cancer.

Now, as Matthew continues his studies at Queen's, he's focused on promoting safe, sustainable mining practices and proudly carrying on his family's legacy.

The Engineering Bridging Program is designed to help graduates of Engineering Technology programs make a smooth transition into upper-year studies in Civil, Mining, Chemical, or Mechanical Engineering at Queen's. It's a faster, more affordable route to a fully accredited engineering degree, and it helps students meet the requirements for Professional Engineer registration. We can't wait to see how this new program—and exceptional students like Matthew—shape the future of our department and the industry.•

SPMEI

SOCIAL PERFORMANCE MANAGEMENT IN THE EXTRACTIVE INDUSTRIES

Queen's University

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Queen's University

Robert M.Buchan Department of Mining

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MINE RESCUE COMPETITION

In preparation for its first appearance at a student mine rescue competition, the Queen's University Mine Rescue Team sought the help of Ontario Mine Rescue (OMR) officers to guide their preparation. During the first week of the Winter semester, the team spent 50 hours getting in-depth technical training. The preparation consisted of confined spaces practice, the use of fire hoses and extinguishers, diagnosis and repair of the BG4 breathing apparatus and the MX6 gas monitor, hasty ground support, advanced first-aid, and procedures for response under American regulations. Throughout the semester, the team continued to practice semi-weekly prior to their departure for the International Collegiate Mine Emergency Response Development (MERD) Contest in Golden, Colorado in February 2025.

The competition was an incredible learning experience. The 7-person team competed in an underground rescue scenario, a confined-space maze scenario, a first-aid contest, an MX6 technician contest, a BG4 technician contest, and a series of written tests. The opportunity to compete in the Edgar Experimental Mine was an invaluable experience for the team, putting their practice to the test in real mining conditions. The group was particularly pleased with their performances in the first-aid and BG4 technician contests, both evidence of hours of meticulous practice. The competition team is prepared to continue next year under the tutelage of experienced members, with eyes set on competing at the IMERC contest in British Columbia.

Mine Rescue team included Curtis Dewasha , Logan Drane, Katie Farella, Dennis Ovdiyenko, Lisa Du Plessis, Maxime Forest and Conrad Beier.

Over the fall 2025 reading week, ten students are completing their Ontario Mine Rescue student certification, instructed by MROs Dan and Matt from Sudbury and Southern districts respectively. On this third day, the students underwent reduced visibility and search pattern drills with use of thermal cameras and link lines. Thank you to our OMR instructors, as well as to the training staff at Kingston Fire & Rescue!

Mine Rescue Team at the Competition in Colorado

Mine Rescue team included: Logan Drane, Conrad Beier, Katie Farella, Maxime Forest, Curtis Dewasha, Lisa Du Plessis, Dennis Ovdiyenko

Queen's University Mine Rescue Club

THEN & NOW

45 YEARS OF MINE RESCUE AT QUEEN'S UNIVERSITY

This year, Queen's University proudly celebrates 45 years since the founding of its Mine Rescue Team. Since its beginnings, the Mine Rescue program has played a vital role in the university's mining community, equipping students with skills to face the unique challenges of mining emergencies and fostering quick thinking and collaboration.

This 1980 photograph shows the determined faces of the very first Queen's Mine Rescue Team—trailblazers who helped establish a culture of preparedness. In contrast, a recent image from 2025 features today's team, outfitted with equipment that reflects decades of technological and training advancements.

Over the years, Queen's Mine Rescue has grown into a model of safety culture and has consistently demonstrated excellence in competitions and training. While the program's exact timeline may include changes and revivals, its spirit of resilience and commitment has endured.

By connecting generations and adapting to new challenges, Queen's continues to inspire future mining leaders, ensuring they're ready to respond when it matters most.•

1980

2025

UNDERGRADUATE STUDENT AWARDS & SCHOLARSHIPS

2025 CIM Poster Competition

Mackenzie Campese (1) placed second in the poster competition at the 2025 CIM CONNECT! Her presentation, which explored the potential of implementing hydrogen in underground mine heating systems, highlighted a promising pathway for advancing decarbonizing in the mining industry.

NSERC USRA and USSRF Undergraduate Research Recipients

Student: Gabrielle Waite (2)
Topic: Separation of Rare Earth Minerals
Advisor: Dr. Farzaneh Sadri

Student: Shannon Harris (3)
Topic: Separation of Rare Earth Minerals
Advisor: Dr. Farzaneh Sadri

Student: Jackson Martin (4)
Topic: Microwave Application in Pyrometallurgy
Advisor: Dr. Chris Pickles

Student: Kailyn Cowan (5)
Topic: Investigating Potential of Mining Waste Recycling for a Circular Economy
Advisor: Dr. Qian Zhang

Pickles Studentship – Undergraduate Research Recipient

Student: Nathan Baroni (6)
Topic: Residence Time Analysis and Lag Optimization in Machine Learning Models for Flotation
Advisor: Dr. Asli Sari

Women in Engineering Summer Research Award

Student: Katie Fardella (7)
Topic: Prediction of Pyrrhotite Content in Cu-Ni Ores using Pulp Chemistry Measurements
Advisor: Dr. Charlotte Gibson

2025 Copper Club Award - The Barry Feldman Memorial Scholarship

Student: Nicholas Page (8)

2025 MetSoc Hydrometallurgy Lucy Rosato Undergraduate Scholarship Award and 2025 Women in Mining Canada Student Trailblazer Award

Student: Rebecca Randall (9)

2025 MetSoc John E. Dutrizac Scholarship Award and 2025 Kostuik Scholarship in Mining Engineering

Student: Sam Pysklywec (10)

2025 Don Lindsay Teck Award

Students: Charis Chang (11), Avangelina Cvetan (12), Luke De Groote (13), and Hartley Rucklidge (14)

2025 J.J. Denney Memorial Scholarship

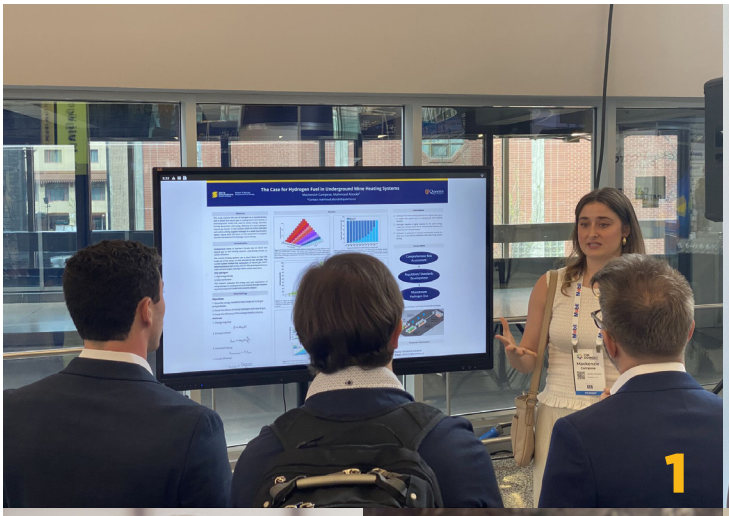
Students: Jackson Martin (4), Nicholas Page (8)

2025 J.C. Gwillim

Student: Nora Gallagher (15)

2025 Alvin Craig Ross Memorial Scholarship

Student: Shannon Harris (3), and Austin Hartley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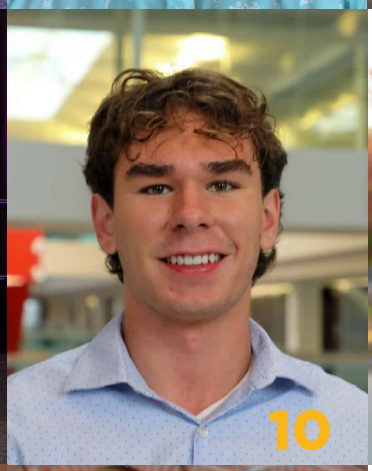
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UNDERGRADUATE STUDENT AWARDS & SCHOLARSHIPS

E. Smith Memorial Scholarship in Mining Engineering

Student: Dennis Ovdiyenko (19)

2025 Kostuik Scholarship in Mining Engineering

Student: Emma Abicht (20)

2025 Polykorp Ltd./ Kumar Scholarship in Mining Engineering

Student: Lan Van Leeuwen (21)

2025 Mining Engineering Scholarship

Student: Erin Esterhuizen (22)

2025 Major J.H. Rattray Scholarship in Mining

Student: Mathieu Racicot (23)

2025 Drilling and Blasting Scholarship

Student: Theron Craig (24)

2025 Mining 1988 Scholarship

Student: Kate O'Sullivan (25)

2025 A.E. Segsworth Prize

Student: Catherine Condhino (26)

2025 Alan Bauer Memorial Prize in Mining Engineering

Students: Sarah Glaspell-Elseri (27), and Curtis Dewasha (28)

2025 Sherritt International Corporation Prize in Mining Engineering

Student: Ryan Dailey (29)

F.K. McKean, Science '40 Prize in Mining Engineering

Student: Mackenzie Campese (30)

The L.J. Patterson Prize in Mine Management

Student: Lisa du Plessis (31)

Medal in Mining Engineering and the E.B. Wilson Memorial Prize in Mining Engineering

Student: Alex Allerano

2025 Kenneth B. Carruthers Scholarship

Student: Jack Ross

2025 Robert F. Segsworth Scholarship

Student: Kaitlyn Watts

2025 Rock Mechanics Achievement Scholarship

Student: Fin McInnes

2025 Applied Rock Mechanics Scholarship

Student: Chunxiao Wang

Canadian Mineral Industry Education Foundation Scholarship Students

Emma Abicht (20)
Everett Allen
Cole Bremner
Quinn Cooke
Theron Craig (24)
Connor Fenkell
Orissa Ghai
Brayden Gibbons
Cameron Godfrey
Austin Hartley
Finlay McInnes
Kate O'Sullivan (25)
Dennis Ovdiyenko (19)
Matthew Paris
Samuel Pysklywec (10)
Rebecca Randall (9)•

Congratulations!

GRADUATE STUDENT AWARDS & SCHOLARSHIPS

2025 MetSoc Doctoral Scholarship Award; and George C. Bateman Memorial Fellowship

PhD Student: Alireza Gholami (1)
Supervisor: Dr. Qian Zhang

2025 MetSoc Master's Scholarship Award; CMP Southern Ontario Scholarship; Graduate Entrance Tuition Award (GETA); and Queen's Graduate Award (QGA)

PhD Student: Marion Oliver (2)
Supervisors: Dr. Charlotte Gibson and Dr. Qian Zhang

NSERC Canada Graduate Scholarships-Master's (CGS-M); and Queen's Graduate Award (QGA)

MASc Student: Amanda Pacholczak (3)
Supervisor: Dr. Charlotte Gibson

Ontario Graduate Scholarship (OGS); and Queen's Graduate Award (QGA)

PhD Student: Oselen Imafidon (4)
Supervisor: Dr. Mahmoud Alzoubi

SAG Conference Graduate Student Award; CMP Southern Ontario Branch's Mineral Processing Scholarship; and The Komatsu Graduate Scholarship

PhD Student: Berke Beste Aktas (5)
Supervisor: Dr. Charlotte Gibson

Runner-up student poster award, Canadian Mineral Processing Conference; Runner-up CMP Southern Ontario (CMP SOT) Branch's Mineral Processing Scholarship; and The Komatsu Graduate Scholarship

PhD Student: Espoir Mushagalusa Murhula (6)
Supervisor: Dr. Charlotte Gibson

China Scholarship Council Scholarship

PhD Student: Xueqing Li (7)
Supervisor: Dr. Abbas Taheri

The Pickles Family Scholarship

PhD Student: Kiana Rahnama (8)
Supervisor: Dr. Farzaneh Sadri

The Harry Isaacs Memorial Graduate Scholarship

PhD Student: Mohammad Sadegh Razavi (9)
Supervisor: Dr. Charlotte Gibson

The Harry Isaacs Memorial Graduate Scholarship

PhD Student: Saad Salman (10)
Supervisor: Dr. Asli Sari

The Komatsu Graduate Scholarship

PhD Student: Batur Tokac (11)
Supervisor: Dr. Asli Sari

The J.J Denny Memorial Scholarship

MASc Student: Olawale Godwill Adubi (12)
Supervisor: Dr. Abbas Taheri

R.S McLaughlin Fellowship; and Queen's Graduate Award (QGA)

PhD Student: Amirshahriar Rostami (13)
Supervisor: Dr. Abbas Taheri

R.S McLaughlin Fellowship; and Queen's Graduate Award (QGA)

PhD Student: Allister Joseph Davies Poulos (14)
Supervisor: Dr. Qian Zhang

George C. Bateman Memorial Fellowship

PhD Student: Ricardo Quevedo (15)
Supervisor: Dr. Asli Sari


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George C. Bateman Memorial Fellowship

PhD Student: Chenyang Wang (16)
Supervisor: Dr. Qian Zhang

The Gordon Bell Fellowship in Transformative Mining

PhD Student: Yagiz Alp Tastekin (17)
Supervisor: Dr. Abbas Taheri

The Gordon Bell Fellowship in Transformative Mining

MASc Student: Katherine Yohanna Arenas-Callao (18)
Supervisor: Dr. Anne Johnson

SGSPA Fellowship

PhD Student: Jamshid Shakeri (19)
Supervisor: Dr. Abbas Taheri

SGSPA Fellowship

MASc Student: Mahta Fakhraei Rad (20)
Supervisor: Dr. Farzaneh Sadri

Queen's Graduate Award (QGA)

PhD Student: Petra Linnea Berin-Costain (21)
Supervisor: Dr. Charlotte Gibson

Queen's Graduate Award (QGA)

MASc Student: Ksenia Lada Bilaniuk (22)
Supervisor: Dr. Charlotte Gibson

Queen's Graduate Award (QGA) and Graduate Entrance Tuition Award (GETA)

MASc Student: John Tofflemire (23)
Supervisor: Dr. Abbas Taheri

Queen's Graduate Award (QGA)

MASc Student: Jean-Paul Karl Lafontaine-Konrad
Supervisor: Dr. Sadan Kelebek

CASH CUTHBERT

AT PRAIRIE MACHINE

From May 2024 to August 2025, I had the pleasure of working as an engineering intern for the Original Equipment Manufacturer (OEM), Prairie Machine in Saskatoon, SK. My story with Prairie Machine began in the summer of 2023 while I was completing a co-op term with the potash mining giant, Nutrien. While working at Nutrien, I witnessed the operation of various pieces of Prairie Machine equipment. I operated their Rokion R100s every day and observed their fascinating Xcel 72A boring machines that are the workhorses of the mine. This motivated me to reach out to a Queen's alumnus that works for Prairie Machine and set up a tour of their manufacturing facility. This fostered conversations of an internship to begin the next summer.

My internship began with familiarizing myself with the Prairie Machine protocols and standards that are essential for all equipment and part designs. Next, I began to learn a new CAD program called Autodesk Inventor. My surface level experience with CAD modelling dates back to my Senior year of high school and first year of university. This meant that I had a lot to learn; however, my co-workers helped alleviate this burden by teaching me the ins and outs of the program. The time spent learning Inventor paid off, as I used this program every day during my internship. From viewing to designing parts for the mining machines, using this program expanded my understanding of what was possible with CAD.

After learning the basics of Inventor, I started designing parts and assemblies. This was a significant learning curve as I needed to learn what was and wasn't possible with machining and welding. The complex world of tolerancing, fitting, positioning, and compatibility was essentially brand new to me. However, having on-site machining, welding, and assembly allowed me to ask skilled workers the best way to tackle certain problems. My co-workers in the engineering department also helped by showing me how to approach and solve problems. Designing parts and assemblies was one thing, but doing so with safety as the first priority added new layers of complexity. Therefore, I had to learn how to properly use Finite Element Analysis (FEA) to determine the failure point of components. This expanded on knowledge gained during my time at Queen's and was therefore easier to learn.

With these new skills under my belt, I tackled customer and internal requests for new parts and part revisions. I was also able to play a large part in several design projects. The first project pertained to the design of a hydraulic cylinder test apparatus that will be used to test hydraulic cylinders for proper function and prepare them for shipping. The second project was specific to the mechanics of rock breakage and involved the design of a test assembly that required a multitude of precise moving parts in conjunction with electrical components. These projects were very engaging and broadened my knowledge of mechanical design.

My time with Prairie Machine didn't just teach me about mechanical design; since some tasks were internal, I was also introduced to the world of corporate planning and budgeting. This experience helped reinforce financial topics covered in classes and show how certain economic concepts play out in real life. The projects I worked on also showed me how companies can effectively conduct research and development to achieve specific goals. The amount of knowledge I gained over the last 16 months was vastly more than I expected. This internship has fueled my passion for engineering and has helped set my career trajectory. I want to thank Prairie Machine for this invaluable opportunity to learn about a vital part of the mining industry.•

STUDENT INTERNSHIPS


LEACH 7

REBECCA RANDALL

AT KINROSS GOLD CORPORATION

From May 2024 to April 2025, I had the opportunity to work for Kinross Gold Corporation as a Metallurgical Intern through the Queen's University Internship Program. This was my second time working with Kinross, having previously been part of the Corporate Metallurgy team during the summer of 2023, following my second year of studies. With my return, I had the added excitement of spending more time onsite, and my internship evolved to primarily supporting the Ore Processing Group at Fort Knox Mine in Fairbanks, Alaska. Over the year, I travelled to Alaska 12 times, trips ranging from 5 weeks to sometimes just 5 days, and when not onsite, continued to support the operation from Toronto.

When I joined the team in May 2024, Fort Knox was in the midst of an exciting new project that became my primary focus for the next 12 months. The Manh Choh Project, a joint venture between Kinross and Contango Ore, located approximately 400 km southeast of Fort Knox, was preparing to enter production, with the ore being processed in campaigns at the existing Fort Knox Mill. My role on the Manh Choh Commissioning team quickly developed into a fast-paced, high-performance commissioning experience where I was directly involved in the first year of this project's life.

From long days commissioning our final circuits, to standing on the grind floor as the first tons of Manh Choh entered the mill, and through many months of fine-tuning, experimenting, and adjusting, I gained invaluable experience. I learned about commissioning a project, toll-milling arrangements, and generally working in operations. Throughout these first few campaigns, I had the opportunity to take on responsibilities such as completing our daily metallurgical reporting, running test work programs in our onsite laboratory, and optimizing multiple circuits in the new processing operation. Along the way, I built a strong foundation of technical skills and had the privilege of working with an exceptional team, led by Queen's Mining alumna, Sarah Ingram.

When I was not on-site, I continued to support the Alaska team from Toronto. I prepared analytics summarizing campaign performance and proposing future actions for improvements, continued our metallurgical reporting, and also became involved on the metallurgical side of future development projects at Fort Knox, working with the wider Technical Service team.

My time at Fort Knox was truly transformative. Professionally and academically, I immersed myself in hands-on learning that strengthened me as a young professional and provided a solid foundation for my future growth. Beyond the technical experience, my time in Alaska pushed me out of my comfort zone, introduced me to a brilliant and diverse team, and allowed me to experience the beauty and unique character of a special part of the world.

Near the end of my internship, in April 2025, I also had the incredible opportunity to visit Kinross' La Coipa Mine in the Atacama region of Chile. This opportunity allowed me to experience another one of Kinross' operations and embark on a thrilling new personal adventure of travelling to South America for the first time, and experience high altitude mining in the Chilean Mountains. While on-site, I completed a Metallurgical Audit of La Coipa's end-of-month reporting process and applied many of the technical skills and knowledge I had developed over the year. This trip was a rewarding culmination of my internship again, both technically and personally.

Looking back, my internship with Kinross was pivotal. It was a year of growth, adventure, and invaluable experience. I am grateful to have had the opportunity to take on different challenges, learn from exceptional mentors, and see firsthand the impact of my work. I leave this chapter with new skills, a renewed excitement to return to Queen's for my final year, and beyond that to continue building my career.•


301-M
EVR

ORISSA GHAI

IN METALLURGIC COAL MINING IN BRITISH COLUMBIA

This summer, I had the opportunity to work as a Mining Engineer co-op at Elk Valley Resources (EVR) and their Greenhills Operations (GHO) on a 12-month professional internship. GHO is an open-pit metallurgical coal mine located near the British Columbia-Alberta border north of the town of Elkford, BC. The position was my first job role in mine operations and in the field, as well as my first time out West! The internship began by making the 36-hour drive all the way from Toronto, Ontario, to the Elk Valley.

I worked in the engineering department, specifically supporting the capital projects group. Throughout my time at EVR, I contributed to and independently managed a range of site projects involving pit development, tailings infrastructure, environmental works, and mechanical systems. In the projects group, I worked closely with a wide range of stakeholders across maintenance, operations, finance, and environment, as well as third-party contractors and consultants, providing me with a holistic view of an active mine site.

My primary focus over internship was planning and executing the demolition and clean-up of the 301-M Marion electric shovel, which was my largest independently led project. In the planning stages of the project, I honed my technical understanding of mining equipment while preparing a scope of work for scrap metal salvage. I also gained hands-on experience in procurement and supply chain management, including leading two Request for Proposals. As the project moved into execution, I focused heavily on stakeholder engagement, specifically while working with maintenance and operations teams.

Appropriate risk management was critical to the project's success, requiring an evaluation of health and safety, environmental, legal, and financial implications. Important considerations specific to this project included migratory bird management, hazardous waste and spill management, winter weather, and safe operation of heavy-duty equipment.

Another notable project I contributed to was the GHO tailings dam raise and construction of the mixed coal refuse (MCR) facility. During its early stages, I learned more about engineering design and performed a variety of field inspections in preparation for civil earthworks. Stakeholder engagement was again critical for this project, requiring collaboration between tailings, reclamation, environmental, and long-range mine planning teams. This project prioritized smooth integration into existing haul routes and infrastructure to minimize disturbance to day-to-day operations while optimizing resource allocation in support of the life of mine plan. The project again demonstrated the interdisciplinary nature of mine operations and how each department plays a critical role in promoting safety and productivity at work.

Finally, outside of the workplace, I had an incredible time exploring the Elk Valley and all that it has to offer. Weekend activities included camping and hiking in the summer, and lots of skiing in the winter. I also had the opportunity to visit a wide range of national parks including Waterton, Glacier, Grand Teton, and Yellowstone. I can confidently say that my internship has been an unforgettable experience. I will most definitely be taking away the memories, skills, and friendships I have made throughout my internship into the next phases of my career and beyond!•

AARON NIJJAR
AT KINROSS GOLD IN TORONTO

Prior to beginning my fifth year of Mining Engineering in the Mine-Mine stream, I completed a 16-month internship at Kinross Gold Corporation in downtown Toronto as an Operations Strategy Intern on the Growth and Pipeline team. This experience provided me with valuable insight into how a senior mining company evaluates and advances projects to drive organic growth within its existing asset portfolio.

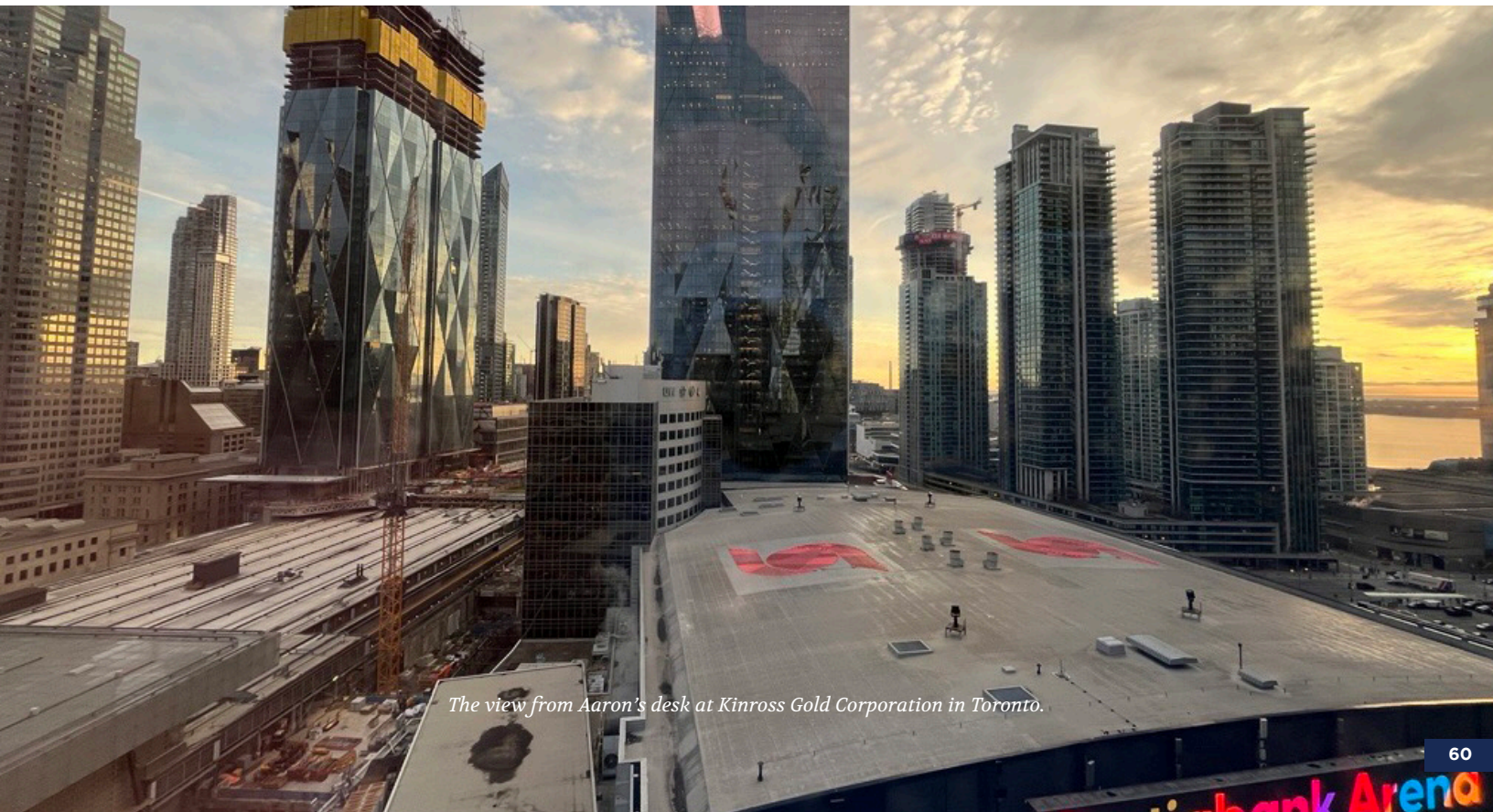
During my time at Kinross, I worked extensively on cost and financial models that supported a variety of growth projects, helping the Growth and Pipeline team assess and compare opportunities under dynamic conditions. I had the opportunity to collaborate with multiple teams across the technical services team while developing first-principles cost models, which deepened my understanding of the true cost of development and production of a mine.

One of the most rewarding aspects of this internship was the development of a strong analytical and problem-solving skill set, particularly in Excel and data analysis-skills that have already been very useful in my final year of studies.

I pursued this opportunity at Kinross to gain a deeper understanding of the corporate side of mining before graduating. Earlier in my degree, I spent a summer at Baffinland Iron Mines as a Technical Services Student, where I gained hands-on experience in drill and blast, surveying, and short-range planning. Having worked both at an operating mine and in a corporate headquarters, I developed a well-rounded perspective on how technical and strategic functions align to support a mining operation.

Living and working in downtown Toronto was also a new and rewarding experience—it was my first time living in a large city. Towards the end of my internship, I had the incredible opportunity to travel to Kinross' Tasiast Gold Mine in Mauritania (Northwestern Africa). Visiting the site in person was an eye-opening experience and especially meaningful, as much of my internship work had been focused on Tasiast-related projects.

Overall, my internship with Kinross Gold was an incredible experience, and I am truly grateful for the opportunity to complete a 16-month internship that provided me with valuable, hands-on experience in the mining industry. •



The view from Aaron's desk at Kinross Gold Corporation in Toronto.

EVAN FINGERHUT

AT FREEPORT-MCMORAN, AGNICO EAGLE AND K2 & ASSOCIATES INVESTMENT MANAGEMENT: FROM DESERT TO TUNDRA TO DOWNTOWN

Over the past 16 months away from the classroom, I had the unique opportunity to complete three internships across the mining industry: four months with Freeport-McMoRan in Arizona, eight months with Agnico Eagle in Nunavut, and four months with K2 & Associates Investment Management in Toronto. Each role offered a completely different perspective, from gold to copper, from Canada to the U.S., from the desert to the tundra, and from open pit operations to underground mining to the trading floor.

In Arizona, I worked on Freeport-McMoRan's Central Mine Planning team, which oversees all long-range planning in the Americas. I was fortunate to work alongside a highly experienced group of engineers and geologists. My summer project involved developing a mine plan for a proposed copper deposit — starting from a block model, I designed pushbacks, planned infrastructure locations, and built life-of-mine schedules at varying processing rates.

Next, I joined Agnico Eagle's Meliadine Gold Mine on a fly-in fly-out rotation in Nunavut. I was part of the Underground Projects team, which collaborates with dispatch and automation to identify ways to increase capacity and production while maintaining a safe work environment. My projects included implementing a new system to track inventory in underground explosives magazines and conducting a business case to expand the hauling fleet. I also participated in the underground immersion program, spending full shifts underground with production, development, and construction crews.

Finally, at K2 & Associates, a multi-strategy hedge fund in Toronto, I worked alongside the mining portfolio managers to analyze mining companies from an investment perspective. I learned to interpret technical reports and drillhole releases, and I built financial and orebody models based on public filings. This experience gave me a broader understanding of the global mining industry, regional dynamics, and the financial mechanisms that keep the mining world turning.

Looking back, I realize how little I knew about the mining industry before these internships. Taking on three different roles meant extra moves and logistics, but it was the right decision for me, as each experience built on the last and helped me discover where my interests truly lie. As I get ready to graduate in April, I feel more confident about the path ahead and, above all, grateful to the mentors who shared their time, knowledge, and guidance with me throughout this journey.•

PRECISION AT THE CORE:
THE ROCK MECHANICS LABORATORY
AT ROBERT M. BUCHAN DEPARTMENT OF MINING

Few labs embody the craft of careful measurement like the rock mechanics facilities supporting the Robert M. Buchan Department of Mining at Queen's University.

From undergraduate teaching to frontier research and industry projects, the Lab is built around a simple obsession: to produce data that are accurate, repeatable, and decision-ready.

WHAT MAKES IT STATE-OF-THE-ART:

At the heart of the RMB. Department of Mining we proudly combine traditional engineering with technological development and process improvement.

Our obsession with accuracy, precision and innovation gives us the ability to provide academic, research and commercial services.

A combination of elements that includes repeatable sample preparation (ISRM/ASTM), computational power with the use of virtual environments to serve multiple applications, configurations and client requirements, state of the art sensors, data acquisition systems and analytical software where sample data and population data can be analysed on demand.

OUR EQUIPMENT:

At the RMB Rock Mechanics laboratory we are proud to display our:

- 3000 kN MTS Servo Hydraulic compression frame.
- 2500 kN MTS Servo Hydraulic compression frame.
- 1000 kN MTS Servo Hydraulic compression frame.
- Triaxial cell capable of 35 MPa.
- An advanced high-pressure and high-pore-pressure triaxial cell capable of applying confining pressure up to 150 MPa and pore-pressure of 140 MPa to samples with diameters of 42 mm and 54.7 mm, while accurately measuring axial and circumferential displacements.
- Servo-controlled direct shear, capable of a constant load of 200 kN and a shear load of 200 kN.
- An advanced direct shear machine which can test large samples (i.e., 200x200 mm and 150 mm in height). Shear and normal displacement of the shear box are recorded by multiple LVDTs, which could be configured in different numbers. The system studies the shear strength under both constant normal load (CNL) and constant normal stiffness (CNS) boundary conditions.
- 64 data acquisition channels measuring load, deformation, pressure, lateral and vertical strain for increased deformation measurement accuracy, secure data storage to safely keep testing information, and scalable computing power to match user and project needs.

Our equipment is calibrated annually, and our technical personnel are continuously trained to keep up with changes. The combination of equipment, expertise and experience will create a final product that can be trusted.

OUR STRENGTHS:

The faculty have developed In-situ triaxial compression testing equipment and new methods to investigate the post-peak behaviour of rocks under compression and tension.

The existing MTS and triaxial loading system can independently provide confining stresses up to 150 MPa, equivalent to a depth of over 4,500 m below ground. The tests can be done under quasi-static or cyclic loading conditions. The high-pressure, high-pore-pressure triaxial testing system is available at only a handful of universities and research centers globally. Queen's is among a few research centers worldwide that can undertake accurate, large-scale direct shear testing on discontinuities in CNL and CNS loading conditions.

In addition, the Buchan Department is known for employing dedicated technical professional lab managers, instrumentation engineers, sample preparation technicians, and QA/QC specialists who maintain schedules, calibrate sensors, train students, and support research. The fact that the department. Having "world-class laboratories" in teaching, research and commercial services implies an infrastructure of professional support to ensure reliability.

WHY DOES THIS MATTER?

By focusing on rock mechanics, RMB Department of Mining demonstrates its command of a discipline that is critical to underground mine design, slope stability, ground control, rock burst mitigation, and more. Because the department integrates teaching, research, and service in the same laboratory ecosystem, it fosters:

- Student training that is not theoretical but directly relevant to industry expectations
- Research with minimized scatter and well-constrained uncertainty
- External test services grounded in defensible experimental protocols
- A departmental reputation strengthened by the dependable quality of its graduates, publications, and external collaborations

In short, within the Robert M. Buchan Department of Mining, the rock mechanics lab is not an auxiliary asset—it is a core expression of the department's identity: rigorous, calibrated, mission-driven, and continually renewing its commitment to accuracy.

COMMERCIAL TESTING SERVICES PROVIDED:

Unconfined Compression:

- Includes: determination of sample bulk density, unconfined compressive strength, Young's Modulus and Poisson's ratio parameters

P-wave and S-wave Velocity:

- Determination of Young's Modulus and Poisson's ratio parameters from core pieces using sonic velocity measurements

Triaxial Confined Compression:

- Determination of triaxial confined compression strength for a single level state of confinement that includes determination of triaxial confined compression strength, including stress/strain and Young's Modulus determination.
- Multi-stage triaxial testing (minimum of 3-4 confinement stress levels per sample)

Brazilian Indirect Tensile Strength:

- Determination of indirect tensile strength (St) of rock using prepared wafer specimens.

Point Load Index Test:

- Determination of Point Load Index (Is) values from rock core of minimum length/diameter size at (1.5/1) (either diametral or axial core orientation)

Direct Shear Test:

- Determination of direct shear strength parameters for core or uncut lump fragments of rock initial shear and full residual shear envelope assessed per specimen (minimum ten residual shear cycles per specimen).

BASIC FRICTION ANGLE (TILT TABLE) TEST:

- Determination of the basic friction angle of sawed core sections, prepared by diametral or axial
- Cutting of core sections and testing on a tilt table apparatus.•

INVITATION TO SUPPORT BUCHAN DEPARTMENT STUDENTS ACTIVITIES

Dear Alumni, Industry Partners, and Friends,

As we reflect on another productive and inspiring year, we would like to take a moment to express our sincere gratitude for your continued support of the Robert M. Buchan Department of Mining. Your generosity plays a vital role in helping us provide an exceptional educational experience for our students — the next generation of mining engineers and industry leaders.

Your charitable contributions make a tangible difference. They directly support student activities, scholarships, and professional development opportunities that enrich our students' education and prepare them for successful careers in the mining sector. Increasingly, our students are invited to participate in design competitions, research conferences, and other experiential learning opportunities that expand their skills and networks. We are proud to support these experiences and strive to ensure that every student has the opportunity to take part.

Your donations also allow us to strengthen our teaching and research facilities by supplementing and upgrading the equipment and experiments used in our undergraduate laboratories. These enhancements ensure that our students are trained using state-of-the-art tools and technologies that reflect the best of today's mining industry.

In our department, we take pride in engaging students through professional societies and activities that extend learning beyond the classroom, including:

- Participation in professional conferences that provide valuable educational and networking experiences
- Field trips to mines and industrial facilities for first-hand exposure to real-world operations
- Extra-curricular activities that develop leadership, teamwork, and interpersonal skills

Unfortunately, neither provincial funds nor tuition revenue can be used to support many of these important initiatives. That is why we rely on the generosity of our mining alumni, industry and friends to help provide these transformative opportunities.

We invite you to join us in achieving our goals by making a gift to the Robert M. Buchan Department of Mining Annual Fund. Your contribution — of any amount — will have a direct and meaningful impact on our students' education and professional growth. Together, we can continue to strengthen the department's reputation for excellence and ensure that Queen's remains a leader in mining education.

Thank you once again for your ongoing commitment and support. Your generosity truly makes a difference — not only in the lives of our students, but in the continued advancement and recognition of our program.

With sincere appreciation,

The Robert M. Buchan Department of Mining

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CAUTION
CHECK YOUR BRAKES
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WE WANT TO HEAR FROM YOU

Alumni Update

PLEASE WRITE TO US! We want to know where life has taken you since you left Queen's University. Complete and return this form (or scan the QR code below) to share your news and comments. Pass this newsletter on, or let us know any alumni who are not receiving Queen's Miner.

Send to: The Robert M. Buchan Department of Mining, Queen's University, 25 Union Street, Room 354, Kingston, ON K7L 2N8

Or, email updates to heather.drouillard@queensu.ca

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2025 YEAR IN REVIEW

Brief News of Professional and Family Activities for Future Newsletters:_____

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