

Detailed Event Schedule

8:30-9am Opening by Kanonhsyonne Janice Hill Associate Vice-Principal (Indigenous Initiatives and Reconciliation).

Welcomes by Dr. Amir Fam, Vice-Dean (Research) and Dr. Kevin Deluzio, Dean, Faculty of Engineering and Applied Science

Session 1A: Low-carbon energy 9-10:15 am, Room MH 215

Discover the future of energy creation, usage and storage and the promising implications for our environment. Connect with experts in renewable energy systems, electric vehicles, digital control technologies, power electronics converters, electrochemical energy storage devices, corrosion control, carbon dioxide conversion technology and high-performance materials.

Session leads [Mark Daymond](#) and [Suzan Eren](#)

Presentations

1. [Laurent Beland](#): Computational discovery of materials for nuclear energy
2. [Levente Balogh](#): Looking behind the scenes: investigating microscopic defects which can both improve and deteriorate materials properties
3. [Joshua Woods](#): Analysis, Design, and Construction of Low Carbon Concrete Structures
4. [Cao Thang Dinh](#): Renewable Fuels and Chemicals from Air and Water
5. [Suraj Persaud](#): Advanced Nuclear Reactor Technologies and the Key Issue of Materials Performance
6. [Dominik Barz](#): An Ion Exchange Membrane-free Yet Ultrastable Zinc-Iodine Battery Enabled by Functionalized Graphene Electrodes
7. [Majid Pahlevani](#): Emerging Applications of Power Electronics
8. [Yan-Fei Liu](#): High Efficiency Power Supply Technologies with GaN Devices
9. [Jackson Crane](#): Engine efficiency and alternative fuels
10. [Snehal Bagawade, Emera](#)

Session 1B: Engineering for Climate Change and Resilience, 9-10:15 am, Room 225/235

Understand how researchers are working to mitigate climate change impacts on infrastructure through projects responding to changes in natural systems and engineering for resilience. This session will examine geotechnical, geological, hydrotechnical and water systems, and their influence on designs focused on the safety and longevity of our natural and built environments.

Session leads [Ryan Mulligan](#) and [Andy Take](#)

Presentations

1. [Dave Gauthier, BGC](#)
2. [Alexander Rey, Baird](#): Incorporating climate uncertainty into coastal forecasting and design
3. [Ryan Mulligan](#): Hurricane impacts in a changing climate
4. [Jason Olsthoorn](#): Engineering lakes for climate change
5. [Élise Devoie](#): Tools for Predicting and Adapting to Permafrost Thaw
6. [Xiaying Xin](#): Biological consequences of the interactions between climate change and emerging contaminants in aquatic primary producers
7. [Mark Green](#): Sustainable and resilient housing
8. [Amir Fam](#): Examining Bridge Resiliency in a Changing Climate using Queen's unique Facilities
9. [Ian Moore](#): Pipe Survivor: ensuring water and sewer pipes outlast the climate reality to be
10. [Fady Abdelaal](#): Using Geosynthetics to Protect the Environment in a Changing Climate
11. [Abbas Taheri](#): Biopolymer Stabilization: A Sustainable Solution for Mine Waste
12. [Andy Take](#): Perpetual care of mine waste: causes and consequences of tailings storage facility breach

30 minutes networking and refreshments

Session 2A: Sustainability and Environmental Engineering, 10:45 am – 12 pm, MH 225/235

Learn about the challenges, progress and innovative opportunities in sustainable engineering for multiple sectors, including chemical production, waste management, mining and manufacturing. Topics will cover environmental and human health protection, environmentally friendly materials such as bio-sourced and recycled material, and sustainable circular economies for materials, chemicals and bioindustries.

Session leads [Sarah Jane Payne](#) and [Laurence Yang](#)

Presentations

[Kent Novakowski](#): Options and Challenges for Carbon Sequestration in Oceanic Crust

[Stephanie Wright](#): Sustainable groundwater resources in cold regions under climate change

[Kevin Mumford](#): Underground gases, groundwater quality and the energy-water nexus

[Yves Filion](#): Protecting Drinking Water Quality in a Warmer Climate

[Xiaying Xin](#): Cyanobacterial Harmful Algal Blooms (CyanoHABs) Remediation by nanobubble-enhanced photocatalytic system

[Muhammad Alam](#): Nanophotonics for thermal management of buildings.

[Marianna Kontopoulou](#): Sustainable plastics: Is there hope?

[Ehssan Koupaie](#): Waste to Resource

[Kevin De France](#): Sustainable Materials from Cellulose & Protein

[Nancy Slipp, KFL&A Public Health](#)

[George Jacob, DuPont](#)

[Wilbert Yang, TetraTech](#)

[Tim Clark, GreenCentre Canada](#)

Session 2B: Biomedical Engineering, 10:45 am – 12 pm, MH 215

Explore innovative solutions for preventative medicine, patients' outcomes and quality of life, and cost efficiencies in medicine. Topics will include assistive technology, reducing the toll of foreign body reactions, wearable sensors for intraocular pressure measurement, exo-sensory augmentation, harnessing inflammation to promote regeneration, movement studies, and speech and hearing health and wellness.

Session leads [Claire Davies](#) and [Brian Amsden](#)

Presentations

[Carlos Escobedo](#): Nanostructured Metals as (Bio)sensors

[Lindsay Fitzpatrick](#): Taking the Toll out of Foreign Body Reactions: Linking tissue damage, Toll-like receptors and biomaterial host responses

[Yongjun Lai](#): Wearable Sensors for Intraocular Pressure Measurement

[Heidi-Lynn Ploeg](#): Can simulations at the micro scale help us to understand changes at the macro scale? Combining ex vivo trabecular bone experiments with micro finite element analysis

[Michael Rainbow](#): Understanding Form-Function Relationships In the Musculoskeletal System

[Roshni Rainbow](#): Harnessing inflammation to promote regeneration

[Laura Wells](#): Polymer biomaterials with an eye on improving ocular devices

[Amy Wu](#): From exoskeletons to legged robots: how human gait studies enable closer human-robot interaction

[Kevin Deluzio](#): Measuring human movement with markerless motion capture

[Wai Yip \(Geoffrey\) Chan](#): Speech, Hearing, Health and Wellness

[Shideh Kabiri Ameri](#): Wearables for health monitoring

[Scott Selbie, Theia Markerless](#): Video based tracking of human motion

[Juan Manuel Gomez Cruz, Spectra Plasmonics](#)

[Chris Miranda, Octane](#)

12-1:30 pm: lunch, networking, and poster viewing in Ingenuity Labs, 3rd floor of Mitchell Hall

[List of posters](#)

Session 3A: Intelligent Systems and Robotics, 1:30 pm – 2:45 pm, MH 225/235

Session 3B: Materials, Resources and Manufacturing 1, 1:30–2:45 pm, MH 215

Enjoy a showcase of current AI and Robotics research, a panel discussion about potential industry impacts, partnerships with organizations and research collaboration opportunities. Learn from and connect with experts in data analytics, machine learning, human-robot interaction, autonomous vehicles, multi-material robotic systems design and virtual/augmented reality.

Session leads [Joshua Marshall](#) and [Asli Sari](#)

Presenters/Panelists

[Asli Sari](#): Digital Transformation and Intelligent Mining Systems

[Matt Pan](#): Creating Remarkable Human-Robot Interactions

[Matthew Robertson](#): Blurring boundaries in engineering: a holistic approach to robotic systems design

[Melissa Greeff](#): Toward Robots that Learn Efficiently, Navigate Robustly and Work as Teams

[Josh Woods](#): Robotics and AI: The Future of Civil Construction?

[Mathilde Hochedel and Océane Dhanaraj, Kinova](#)

[Paul Webster, IPG Photonics](#)

[Zhe Dong, Google](#)

Hear about mining, extraction, and materials research with a focus on critical metals from academic, government, and industry speakers. Showcased projects will highlight geostatistics; mineral processing and extractive metallurgy; alloy manufacture and behaviour; community-Indigenous relations for resource extraction; and battery recycling.

Session leads [Charlotte Gibson](#) and [Nick Hudon](#)

Presentations

[Julian Ortiz](#): Geostatistics and Geometallurgical Modelling

[Ahmad Gahreman, Cyclic Materials](#): Resolving Vast Production Shortage of Rare Earth Elements

[Charlotte Gibson](#): Lithium Mineral Processing

[Chris Pickles](#): Microwave-Assisted Comminution and Sorting

[Bradley Diak](#): Making Materials Behave: Limits on Lifetimes

[Qian Zhang](#): Envisioning low-carbon pathways for material circularity

[Boyd Davis, KPM](#): Clarity in Process Development

[Christopher Baxter, NRC](#): Li-Ion Battery Material Recycling at NRC

30 minutes networking and refreshments

Session 4A: Information and Communications Technology, 3:15-4:30 pm, MH 225/235

Electrical and Computer Engineering researchers engaged in creating computer architecture and systems, engineering software and designing high-speed electronics will demonstrate innovative technologies in cyber security, communication networks, parallel processing and more. This session will focus on department's forward-thinking research, and positive impact at the national and international levels.

Session leads [Ying Zou](#) and [Alex Tait](#)

Presentations

[Ning Lu](#): Engineering connected intelligence: the interplay of networking and AI

[Ahmad Afsahi](#): High-Performance Communication for Deep Learning

[Tom Dean](#): Security and Robustness Testing

[Ryan Grant](#): The Challenges of Computing at Extreme-

Session 3B: Materials, Resources and Manufacturing I, 3:15 – 3:45 pm, MH 215

Session 3B continues until 3:45 pm.

[Anne Johnson](#): The Critical Minerals Strategy and Interdisciplinary Research Networks

[Miles Armitage, Li-Cycle](#): Global Battery Recycling

[Vahid Fallah](#): Towards an AI-powered Process Control in Laser Metal Additive Manufacturing

[Carlos Saavedra](#): 3D Printed Antennas and Lensing Structures for Communications and Radar Systems

Session 4B: Materials, Resources and Manufacturing II, 3:45 – 4:30 pm, MH 215

This session will demonstrate how fundamental research translates to engineering applications. From fundamentals of chemical synthesis and green chemistry, presentations

<p>Scale</p> <p>Jianbing Ni: Safekeeping Your Valuable Digital Asset Everywhere</p> <p>Muhammad Alam: Optical metasurfaces for beam steering and lens design</p> <p>Steven Blostein: Converged Communications and Sensing</p> <p>Alladin Saleh, Rogers</p> <p>Dimple Thomas, Ericsson</p> <p>Dan Desjardins, Distributive</p>	<p>are to illustrate how the development of new chemical processes and communication systems are supported by fundamental research in feedback control design and systems analysis.</p> <p>Session lead Nick Hudon</p> <p>Presenters</p> <p>Scott Parent</p> <p>Nicolas Hudon</p> <p>Martin Guay</p> <p>Jason Olsthoorn</p>
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4:30 – 6 pm: Wine and Cheese Reception with Poster Prize Announcements, Mitchell Hall Atrium