NEWSLETTER

THE ECE CURRENT

ISSUE 1 | APRIL 2026

This newsletter highlights the people, research, and ideas driving innovation in the Department of Electrical and Computer Engineering. From groundbreaking research and student achievements to industry collaborations, our community continues to push technological boundaries and develop solutions that address real-world challenges.

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Gimaakwe Gchi-gkinoomaagegamig atemagad Naadowe miinwaa Anishinaabe aking.

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Electrical and Computer Engineering

DR. IL-MIN KIM
DEPARTMENT HEAD
ELECTRICAL AND
COMPUTER ENGINEERING

A Message from the ECE Department Head

Dear ECE Community,

It is my pleasure to introduce the inaugural newsletter of the Department of Electrical and Computer Engineering. This publication will highlight student achievements, academic and research successes, and the events and initiatives that strengthen our departmental community. I am proud of the outstanding work our students, faculty, and staff are doing—advancing research, expanding hands-on learning, and building partnerships that translate ideas into impact.

Our facilities, including the Bain Computer Lab and the Electrical '65 Experimental Development Laboratory, provide students with hands-on, industry-relevant experience and reflect our continued investment in modern engineering education.

Thank you to everyone who helped make our recent events a success. Your efforts showcased exceptional student and faculty work and created memorable community moments like ECE Night.

We look forward to building on this momentum by expanding current initiatives and launching new ones, including the inaugural ECE Industry Connect 2026–27, which will bring industry together with students and faculty for meaningful engagement. These annual events will continue to highlight student accomplishments and strengthen our connections with industry and alumni.

Warm regards,
Dr. Il-Min Kim
Professor and Department Head,
Department of Electrical and
Computer Engineering

INSIDE

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TRANSFORMING THE STUDENT EXPERIENCE: THE ELECTRICAL '65 E.D. LAB

"Every student I talk to has the same question — where would we have gone before this existed?"

Vince Lentini, the ECE technologist who manages the Electrical '65 E.D. Lab maker space on the second floor of Walter Light Hall, has seen first hand how its creation has improved education, grown skills, and fostered community in the department.

Funded by the ECE class of 1965, the maker space has been in operation for only a few years, and now sees hundreds of students pass through it every term.

Tom Bain, Sc'65, who co-coordinated the class gift funding of the space, explains that it continues a legacy of philanthropy. Bain was the donor behind the Bain Library in 1986, which later became the Douglas Library's Bain Reading Room. The maker space's lineage "started with the Bain Advanced Computer Laboratory in 2006, followed by the Electrical '65 Experimental Development Laboratory in 2022," Bain says.

In that spirit, the maker space also continues to evolve, as Lentini talks to students back from internships about equipment used in the field to keep it up to date with industry realities.

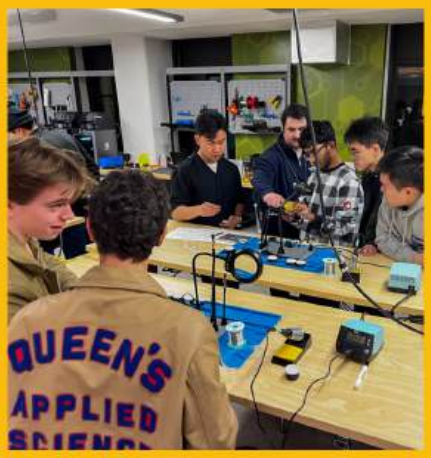
About Sc'65 Lab

It is made possible by a generous donation from the '65 alumni to provide students with a space where they can tinker with their projects. This expanding learning space allows Electrical and Computer Engineering students to explore, create, and innovate.

Event Photos

Students in the Sc'65 lab during the ECE Night Competition event held on January 7, 2026.

A DEPARTMENT FIRST: ECE NIGHT!



Technical challenges, engineering quizzes, and lots of laughter – the Department's first ECE Night on January 7 had students from both the electrical and computer engineering disciplines come together at Walter Light Hall.

"We wanted to combine the academic component of engineering and an event allowing students, faculty and alumni to come together to have fun," says department head Il-Min Kim.

At the event, 75 participants were divided into teams of three (including one team of faculty members). They moved across four challenges, ranging from building electronic circuits to debugging code. After the skill-based rounds, attendees gathered for trivia covering everything from the age of the building through the formula for Ohm's Law.

The event was designed to show that the electrical and computer engineering disciplines are part of a collaborative community, with teams needing to bridge both areas to complete challenges.

The undergraduate ECE Club took the lead on event planning. "Community is one of the strongest aspects of Smith Engineering," says Liam Osborne, President of the club. "It's why our alumni are so close, it's why there's such a bond between not only electrical and computer engineering, but our whole faculty. We're tomorrow's leaders, and for me, this is what engineering is all about."

As well as being a space where students can pursue individual projects, the space has also become a place where clubs and communities can gather, and students can mentor other students. "One of the things I try to instill in the students is to help others — if you're experienced at soldering and see somebody struggling, tell them 'I've been doing this for five years, I can lend a hand,'" Lentini says. "If a design team wants to train, we can set up full workshops in this space, put whatever they need up on the giant screen, and create a training opportunity."

Alumni support made the space possible, and continuing support is instrumental to its success. "We always need consumables," Lentini says, "ranging from wire to microprocessors; we're the only space on campus that doesn't charge for 3D printing, which gives engineering students the chance to design and improve and iterate, but we go through a lot of materials."

"To be able to assist staff in providing facilities and equipment that students need and want, without administrative oversight, is satisfying," Bain says. "It's very rewarding to hear that both staff and students are pleased with the space."

TURNING ECE, SMITH ENGINEERING AND QUEEN'S INTO A SUPERCOMPUTING LEADER

Dr. Ryan Grant isn't shy about his aspirations for the university to become a growing presence as an international leader in computing research. His optimism is well-founded, given his own acclaimed work with supercomputers.

Grant's research focuses on accelerating communication between computers. In his world, time moves in microseconds, and improving software — and collaborating with hardware developers — can create a step change in computing power.

"Supercomputers are just collections of smaller computers, and communication over those networks is highly specialized," he says. "When you make a request to a data centre, your request needs to be processed by a computer that has to talk to other computers. It might take 50 or 60 microseconds, millionths of a second, for information to pass from one to the other. In the specialized computers we're working with, that number is getting closer to one. Reducing latency helps enable AI, large simulations, personal medicine solutions... all of this is dependent on the ability of large computers to communicate quickly and at large volume."

> "We have the opportunity to make Smith Engineering, and Queen's University the premier institution for the end of an innovation pipeline in supercomputing. Leaders in the nitty-gritty, rubber-meets-the-road challenge of being the connection that takes AI from the research lab to the robot in your house."

Dr. Ryan Grant and Dr. Ian Karlin with graduate students Brooke Henderson, Ethan Shama, Shaina Smith, and Ali Farazdaghi from the CAESAR Lab at Queen's University. ***Photo credit: Queen's Communications***

This focus on speed and efficiency plays directly into Grant's other research specialty, green supercomputing. "It's not just about speed, although faster is generally more energy efficient," he says. "Green computing is about getting something for nothing — reducing power consumption, but also looking at how we cool systems. The shift to cold plates, water-based cooling, has created opportunities to heat buildings, run greenhouses, contribute to industrial processes. It's about taking these primary loops for cooling systems, transferring heat, closing the loops so as to not consume a ton of water."

Grant is confident that ECE, Smith Engineering and Queen's are moving the university into a new paradigm of computing leadership. "We might want to look at training our own large language models here in Canada, rather than being reliant on the US and China," he says, "and we can do this here at home, where some of the world's top AI talent is."

"Developing AI, industrializing it, that's a place where we can assume global leadership. With alumni support, anything is possible in this space."

"Worldwide, many supercomputing centres are based at academic institutions. These environments are perfect because they provide a built-in training pipeline through which students receive hands-on experience with key technologies. They also have wide-ranging research activities across all disciplines that can require and benefit from supercomputing infrastructure."

– Dr. Ryan Grant
Electrical and Computer Engineering,
Smith Engineering at Queen's University

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APRIL 2026

ECE EXCELLENCE ON CAMPUS... AND BEYOND!

Baja wraps 2025
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QVEX U Robotics takes 3rd place at Framingham
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Queen's Relectric is ready to compete
@queensrelectric

The GECE Three-Minute Thesis competition was held on March 11 at the Queen's Pub. Grad students presented a single slide in three minutes (using no notes!), and competed for cash prizes.

ECE took home the trophy in a match against "Tron" (Mechatronics & Robotics) at the January 24 hockey Powercup...

...and doubled that count at the subsequent Powerball basketball tournament! Two sports, two wins for ECE (but we still love Tron).

aQuatonomous placed 3rd in the world at RoboNation RoboBoat 2026 in Sarasota, Florida

MAKING THE WORLD SAFER THROUGH AERIAL ROBOTICS AT ECE

Dr. Melissa Greeff has a vision of a safer Canada — one where civilians and rescue workers can look to the sky for help.

"I got into aerial robotics because I have a background in aerospace, and this brings the opportunities of robotics to many useful applications, for example, surveillance, infrastructure monitoring or search-and-rescue (SAR)," she says. "All the regular challenges of autonomy in robots... with flying on top of that."

Greeff's work in recent years has focused on the use of AI-enhanced aerial drones. One of her current projects is developing robots that can enhance intelligence, surveillance and reconnaissance (ISR) capabilities in the far north. "I want to build systems that can make decisions for themselves, and are resilient enough to operate in harsher and harsher environments," she says. "I'd love to be able to put a swarm of aerial robots in the Arctic to act as a gap-filler for ISR by building resilient unmanned aerial vehicle (UAV) autonomy algorithms and then field-testing them in very aggressive conditions."

Using aerial robots for search-and-rescue is key to another project Greeff is working on in collaboration with ECE professor Jon Gammell. That project aims to help the Canadian Coast Guard with water search and rescue. "The goal there is to create an autonomous aerial system that supplements existing search and rescue operations," she says. "We aim to use intelligent onboard path planning and perception to find and recognize anomalies, feeding that information back to SAR crews to enhance their missions."

"Aerial robotics operates under fundamentally different constraints," she explains. "First, an airborne vehicle must function without nearby human intervention." Unlike ground robots, which can often rely on a human operator in close proximity, a drone operates remotely and must remain fully autonomous and self-reliant once airborne."

"Second, flight requires operating in three dimensions rather than two. This adds significant dynamic complexity, including continuous disturbance rejection in the presence of wind and rapidly changing environmental conditions. Most critically, aerial systems are constrained by weight. "Gravity is the constant adversary," Greeff says. Unlike ground vehicles, where additional mass can often be offset with more power, every gram added to a flying platform directly affects endurance, manoeuvrability, and safety. "We are always constrained by size, weight, and power," she notes — a balance that fundamentally shapes both the design and control of autonomous aerial systems.

ECE STUDENT SETS HER SIGHTS ON SHAPING AI POLICY

As she contemplates graduation from Computer Engineering, Sophia Thurston is thinking about how she has shifted from wanting to work in hands-on coding to considering how she can help shape the ways society and industry approach artificial intelligence.

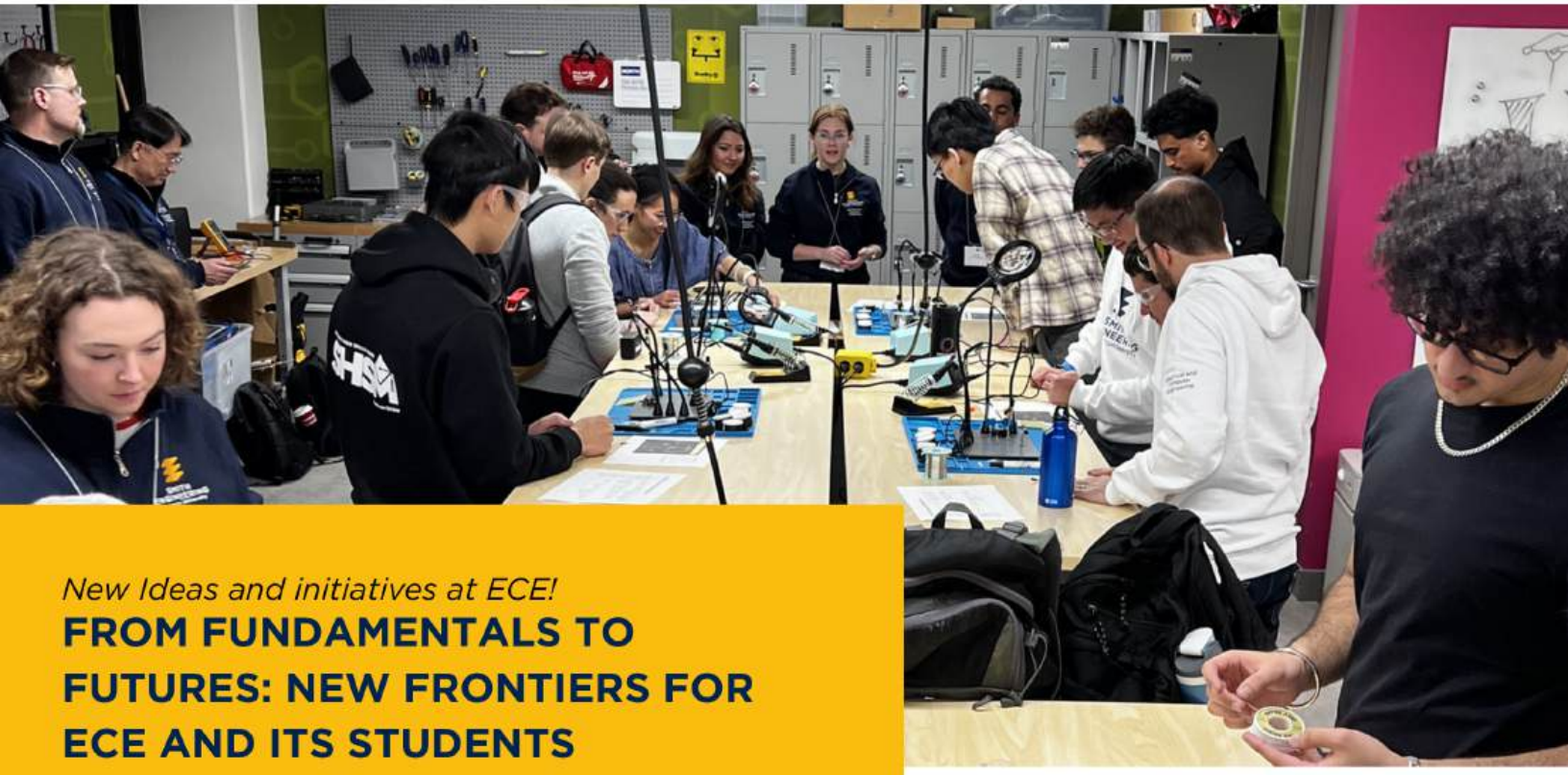
"AIs have become much more prevalent since I started university, and I've been moving toward user-focused software development," she says. "I'll be starting a Master's in September, which will be related to AI, and hope to move into other work looking at public policy and use cases."

Her time as an Engineering Society executive was part of a shift toward thinking of policy and structure as an area of interest. "As the Vice-President of Student Affairs, it really got me thinking about how it's important to help equip people to do what they want to do, instead of just doing things for them."
Thurston is looking forward to her next steps at graduate school, and an eventual move into the industry. "I don't want to be the person who sits down and codes the AI," she says. "In the grand scheme, people are going to use it themselves, in their companies. How can I help in making sure that's done in a responsible way?"

EXPLORING AI MODELS AT ECE, WITH A FOCUS ON BIAS REDUCTION

Pursuing her PhD in computer engineering, graduate student Azadeh Motamedi has had an academic career that has paralleled the evolution of AI. "I started with federated learning," she says, "then I began moving toward foundation models, large language models, and vision language models."

"It's really important to address the issue of bias," she says, "if we're going to make these AI models safe and trustworthy." Bias, as she explains it, was prevalent in early use cases; "if you asked an early version of ChatGPT to generate an image of a 'kind' person for you, it would create a woman. But kind people aren't necessarily women, just like an angry person is not necessarily a man. Society is moving forward, and we don't want future technologies to inherit the same cultural and gender biases that exist today."



New Ideas and initiatives at ECE!

FROM FUNDAMENTALS TO FUTURES: NEW FRONTIERS FOR ECE AND ITS STUDENTS

As seen in our story about the Electrical '65 E.D. Lab, having this facility in Walter Light Hall is not only a benefit to student learning, but to the entire ECE community. Spaces like this encourage innovative thinking and skills development, and foster collaboration and camaraderie.

The Department's goals for the space continue to evolve, with the ultimate goal of making it a resource that will allow students to access top-of-the-line equipment and train them on the same tools and to the same standards they will see in the industry.

These tools would include a laser cutter for PCB stencils, a PCB pick-and-place machine, and other fabrication tools like the existing LPKF S104 PCB Milling machine, all backed by essential infrastructure upgrades including enhanced ventilation and a fume hood, a dedicated sink for PCB cleaning, improved climate control, and airtight separation. The Department would also reconfigure the layout, clearing the middle wall to create a larger, flexible workspace for sanding, drilling, assembly, and wet and dry processes, enabling safer, more efficient workflows.

"With alumni support, we could see an upgraded fabrication space that mirrors industry environments and provides students with rare, career-ready experience in modern prototyping and small-scale manufacturing," says Department Head Il-Min Kim.

"The Department of Electrical and Computer Engineering must remain rooted in the fundamentals of excellence in engineering. But in addition to teaching core principles, we must always be thinking of the future of engineering education. An improved space would enrich course offerings, accelerate capstone projects and student startups, support faculty-led research, and expand community outreach and training initiatives".

"Building on the success and impact of the Class of '65 maker space, this initiative represents a strategic opportunity to prepare graduates with practical skills employers seek." he says. "We invite donors to partner with ECE to realize this vision and make a lasting investment in student learning, innovation, and workforce readiness."

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DONATE TODAY...

Support the Department directly through our discretionary fund!

We're looking for courageous alumni willing to prove their mettle at our next ECE Night! Teams of three compete in challenges ranging from soldering to coding to engineering (and ECE) trivia.

If you think you have what it takes, email peter.rowsome@queensu.ca for follow-up when the next ECE night is being planned.

TEST YOUR SKILLS AGAINST OUR STUDENTS!

CONTACT US

General

Room 416
Walter Light Hall
ece.queensu.ca
ecerecpt@queensu.ca
613-533-2925

Il-Min Kim
Department Head

ilmin.kim@queensu.ca
613-533-6000 x77672

Peter Rowsome
Department Manager

peter.rowsome@queensu.ca
613-533-6000 x74948

Will Pennell
Director, Development

william.pennell@queensu.ca
613-533-6000 x79531

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