ENGINEERING

TEA RESEARCH. ENTREPRENEURSHIP. ENGINEERING WITH IMPACT.

20 | SPRING 2026

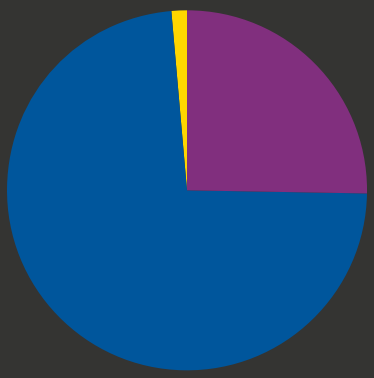
DALHOUSIE UNIVERSITY | FACULTY OF ENGINEERING

1,999
UNDERGRAD STUDENTS

450
GRADUATE STUDENTS

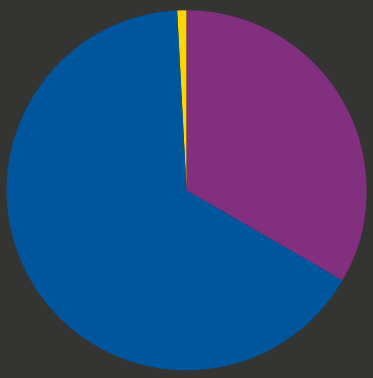
2,449
TOTAL ENROLLMENT

UNDERGRADS



73.5% MALE
25.3% FEMALE
1.2% OTHER

GRAD STUDENTS



MALE **65.5%**
FEMALE **33.5%**
OTHER **0.8%**

89%
CANADIAN

11%
INTERNATIONAL

55%
NOVA SCOTIAN

101
FACULTY

511
SEXTON SCHOLARS

10
RESEARCH CHAIRS

21,000
ALUMNI

3
SEXTON LEADERS

98%
CO-OP PLACEMENT

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DalEngineering
FacultyofEngineering
Dalfacultyofeng

Greetings to our engineering community.

Nova Scotia and Canada are in the midst of a major shift towards renewable energy, with ambitious goals to power our communities through cleaner, more sustainable sources. Engineers will play a critical role in making that transition possible, and here at Dalhousie University, our students and researchers are leading the way.

In this year's issue of Engineering, you'll discover why Dalhousie Engineering is the place to be for students interested in renewable energy, hands-on learning and research that's set to make a big impact on our world. Whether you're pursuing a bachelor's degree or a PhD, there are countless opportunities to work directly on renewable energy projects alongside leading experts.

It's no surprise that more students than ever are choosing to study at Dalhousie Engineering. This year, we welcomed our largest first year class in our history! Students are choosing Dalhousie Engineering because of the opportunities available. From cutting-edge research projects to hands-on design teams, student societies, and supports that help you succeed, we've continued to enhance our student experience throughout the years.

At the same time, we're continuing to build a more inclusive and welcoming engineering community. This year, we proudly opened the new Indigenous Student Centre on Sexton, providing a space where Indigenous students can study, connect, and build community. Thanks to the Johnson Scholarship Foundation's generous $1 million donation to the Inclusive Pathways to Engineering Careers Program, even more students now have access to scholarships through this incredible initiative. The Foundations' generosity has inspired and motivated additional alumni and partners to support this initiative as well.

I would like to extend my sincere thank you to all our alumni, donors, industry partners, and friends. Your support makes all these opportunities possible and ensures our students have the tools they need to shape a better, more sustainable future for everyone.

We are excited to share these initiatives and more in this edition of Engineering, and we look forward to staying connected with you in the year ahead.

Sincerely,

Dr. John Newhook, P.Eng., FCAE, FCSSE
Dean, Faculty of Engineering

Land Acknowledgment

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treaty rights in Canada.

We recognize that African Nova Scotians are a distinct people whose histories, legacies and contributions have enriched that part of Mi'kma'ki known as Nova Scotia for over 400 years.

New Research Chair at Dalhousie Turns Water and Energy Ideas into Action

Water and energy are deeply connected, and both are under pressure. Known for its strength in both renewable energy and wastewater treatment, Dalhousie's Faculty of Engineering just got a major boost in research from the lab next door.

Last fall, Dr. Mita Dasog was appointed the Faculty's new Tier 1 Canada Research Chair in Advanced Design for Water-Energy Sustainability, a joint position with Dal's Faculty of Science.

After joining Science in 2016, she established a materials science lab focused on addressing major challenges in energy and water. Her team designs nanomaterials, tiny particles that interact with sunlight, to produce hydrogen fuel, clean water, and recover valuable minerals. She says the goal is to do more with less: less energy, fewer expensive materials, and a lower environmental impact.

For example, her lab is creating materials that can turn seawater into hydrogen fuel, a clean energy source that could work almost anywhere. Now with her move into the Faculty of Engineering, there are new opportunities to take those ideas further.

Interdisciplinary Approach

Now she's starting to look at the bigger picture, including how much energy it takes to produce materials, how to keep processes safe, and how the technology can be deployed outside the lab.

"Being part of Engineering, you really start thinking about scale-up," she says. "It's not just about making a single unit. We have to think about the supply chain, the manufacturing, the social implications, and how it all works once it's out in the real world."

Tackling these challenges requires more than science or engineering alone. It's about bringing expertise together to move materials from the lab into the real world.

"Being jointly appointed gives us the opportunity to connect fundamental research with applications and focus more on higher-level integration, from materials design to applying them in real-world systems," she says. "Engineering helps bring all of those pieces together."

Real-World Impact

This is exactly what drives the impact of her work: creating solutions that can be used in communities and industries. One current focus is green hydrogen, a clean fuel that could replace fossil fuels in energy-intensive processes. Traditional hydrogen production is expensive, energy-intensive, and often relies on ultra-pure water. However, Dasog's materials use sunlight and low-cost elements, offering a cleaner, more accessible alternative that could benefit everyone, not just a privileged few.

"The goal is to think cradle to grave," she explains. "From the materials we make in the lab to how they are manufactured, transported, used in the real world, and how can they be recycled and repurposed after their intended use. We want solutions that are practical, scalable, and sustainable."

Hands-on Opportunities

Although her lab on Dalhousie's Sexton campus is still under construction, students will soon have the chance to tackle these challenges firsthand.

"In the past, we have hosted Engineering undergrads and co-op students to help scale up our prototypes and test real-world applications," she explains. Now, graduate students will also get the opportunity to explore how materials interact in complex systems and move closer to practical deployment.

"We truly are at a crisis point. We need solutions, like yesterday."

– DR. MITA DASOG

Inspiring the next generation of leaders has always been important to Dasog, particularly women in STEM, who often struggle to find role models within the field.

"A lot of women in STEM are told, 'Maybe math and physics isn't the field for you; maybe you should try biology or medical sciences,'" she says. "I heard that from teachers, family, all well-meaning people. I want to be there so others can see themselves in me. I enjoy interacting with women and girls, not to force them into STEM fields, but to show there's a place for them here, if they choose."

Motivated by the Planet

For Dasog, mentorship is part of a much larger picture. She points out that the challenges facing the planet will only be solved by a diverse generation of scientists and engineers.

"We truly are at a crisis point," she says. "We need solutions, like yesterday."

But complex challenges require more than expertise in a single field. She says students often learn subjects in isolation, but real-world problems require collaboration across disciplines.

"When you're thinking about answers, you really do have to take your training from different disciplines into consideration. You have to work with people in adjacent fields or even transdisciplinary topics to come up with more holistic answers."

Addressing these challenges though, isn't just about research, it's about the kind of future she'd like to leave behind for her children.

"At least for me, I would like my daughter to have a safe planet," she says. "When she grows up, I want her to face fewer challenges than we are dealing with today. That's part of what drives me."

Dalhousie Engineering Students and Faculty *Shape the Future of*

Renewable energy is the key to fighting climate change, and Dalhousie University's Faculty of Engineering is leading the way. For students passionate about making a real difference and building a cleaner, greener future, there's no better place to be than Dal.

For decades, Dal Engineering has been at the forefront of renewable energy, working with industry partners to develop cleaner sources of power such as wind, solar, hydro, and biomass. That work is a key part of the effort to help Nova Scotia slash greenhouse gas emissions by 2030 and reach net-zero by 2050.

But it's not just faculty leading the charge. Students from undergraduate to PhD are teaming up with industry partners to tackle these complex energy challenges. From designing advanced batteries to testing hydrogen systems, they gain hands-on experience that's difficult to find anywhere else.

In the pages ahead, you'll meet engineering students and recent graduates who are making a real impact in their fields and turning ideas into solutions that are shaping the future of renewable energy.

Turning Manure into Clean Energy

Dalhousie Engineering PhD student Koushika Kumaresan is turning agricultural waste into renewable energy. Her fascination with manure began during her agricultural studies on Dalhousie's Truro campus, where she saw firsthand how untreated animal waste could harm the environment.

"I've always been interested in finding sustainable solutions, especially when it comes to manure management," she says.

Once at Dal Engineering, Koushika joined the Circular Process Engineering Lab under Dr. Khaled Benis, a professor in the Faculty's Department of Process Engineering and Applied Science. Her research focuses on biomass pyrolysis, a process that heats organic waste without oxygen to create bio-oil, biochar, and pyro-gas.

"Biochar can be used to adsorb pollutants or as a carbon material," explains Koushika. "Bio-oil can be converted into biodiesel, and pyro-gas can be used to generate electricity." By converting poultry manure through pyrolysis, nutrients and metals are stabilized, emissions are reduced, and waste becomes usable energy.

Koushika is now optimizing the process by comparing manure from broiler and layer chickens to see how composition affects outcomes. To do so, she adjusts temperature, heating rate, and duration to improve efficiency.

"Sometimes experiments don't give you the results you expect, but when things start working, it's very rewarding," she says.

Although her research is still in its early stages, she believes it could lead to more sustainable ways of managing agriculture and producing energy in the future. A process she's very excited to be a part of.

"This project brings together everything I've been interested in since my undergraduate studies," she says. "It's about finding solutions that reduce harm, support sustainability, and turn waste into something useful."

Bringing Clean Power to the Far North

For recent Dalhousie graduate, Hayley Knowles, engineering was all about solving real problems for real people.

And that's exactly what she did during her master's research in Mechanical Engineering. Her project focused on bringing renewable energy to a remote Indigenous community in northern British Columbia where she had the opportunity to make their daily lives cleaner, easier and much more sustainable.

She says many communities in the north rely on diesel-powered microgrids that are expensive, noisy, and often very unreliable. Under the supervision of Mechanical Engineering professors Dr. Lukas Swan and Dr. Andrew Swingler, Hayley explored how solar and wind power, paired with energy storage, could reduce diesel use and improve reliability in extreme, remote conditions.

"What do these communities want? How can we design systems that fit their needs? Every community is so different," she says when talking about some of the challenges she faced in finding the right solutions.

Her work, however, went beyond the technology. She had to consider the community's priorities, challenges, and long-term goals to ensure the solutions she developed actually worked for the people using them.

Her research eventually led her into industry, where she secured a full-time position with Hatch, a top engineering firm. There, she has gained hands-on experience building hybrid renewable systems and learning what it takes to turn research into real-world solutions.

"Working with both research and industry helped me see what it takes for these projects to succeed, start to finish," she says.

Since joining the company, Hayley is still putting her engineering skills to work, developing renewable energy projects across northern Canada while collaborating directly with communities in the field.

"I love using science to work with people," she says. "And I love solving problems for unique lifestyles and backgrounds."

Powering the Future with Hydrogen

If there's one lab at Dalhousie Engineering that's sure to provide undergraduate students with hands-on experience in renewable energy, it's the Green Hydrogen Applications Research Lab.

Since opening its doors in 2024, the lab has provided students such as Amel Ali and Cash Bertolo with the opportunity to explore how hydrogen can be safely blended into everyday household appliances such as gas stoves, water heaters, boilers and barbecues. Over the course of a summer, the chemical engineering undergraduates tested these hydrogen-natural

gas mixtures, gaining firsthand experience with flame behavior, efficiency, and the safety considerations essential to bringing clean energy into homes.

"My project looked at what happens when you mix hydrogen into a stove's fuel and how it affects emissions, performance, and safety," says Cash. "We started with 100% natural gas and gradually worked up to a 50/50 hydrogen mix, testing different stove settings along the way. And yes, we even baked cookies with hydrogen-blended gas. They were delicious!"

Meanwhile, Amel focused part of her time behind the scenes, developing safety procedures and designing components for hydrogen-compatible equipment. The experience gave her insight into the engineering work that happens before experiments even begin.

"One of the highlights for me was redesigning a stove burner to work with hydrogen's shorter flame," she says. "I adjusted the gaps in the burner, built the design in SolidWorks, and got to see it come to life through multiple trials. It was a hands-on way to sharpen my engineering skills while contributing to real solutions, and it was exciting to watch each iteration improve."

For both students, working in the lab gave them a deeper understanding of how university research supports long-term community goals and how they might one day contribute to future renewable energy solutions through academia.

"It gave me hope," says Cash. "I can look forward to my work one day and feel that my contributions matter. Even in research, where the impact isn't always obvious to everyone, what we do here can make a real difference."

"It's so important to take what we learn in the classroom and use it to make a positive impact on the world," adds Amel. "It was truly an honor to be part of the Hydrogen lab."

Turning Renewable Power into Industry Fuel

Industries around the world face the same challenge: cutting carbon emissions in sectors that need enormous amounts of energy.

In Nova Scotia, the problem is not a lack of renewable power. With some of Canada's strongest wind resources, the province can generate clean electricity. Still, energy-intensive sectors such as shipping, heavy transport, and industrial operations cannot rely on electricity alone. That's where green hydrogen comes in.

Master of Industrial Engineering student Andrew Swift is exploring how renewable electricity can be turned into hydrogen,

a zero-emissions fuel capable of meeting high energy demands. Using electrolysis, wind and solar electricity split water into hydrogen and oxygen.

"During some of my co-ops, I worked on solar energy projects for rural communities," he says. "That experience made me want to dive deeper into how we can make renewable energy work on a larger scale."

His research focuses on combining wind and solar power, storage systems, and electrolyzers to produce hydrogen cost-effectively. "It really requires a regionally tailored solution," he says. "You need to assess local resources, regulations, the environment, and market conditions to figure out the most cost-effective approach." Some of his results suggest that in Nova Scotia, most energy should come from wind, but solar can also play an important role.

While his model could be adapted anywhere, Andrew is using Nova Scotia as a case study. "There is strong policy interest in developing and exporting green hydrogen," he explains. "Nova Scotia's wind resources and deepwater ports make it an ideal place to produce hydrogen that can be shipped directly to European markets."

Andrew hopes his work will one day move beyond the lab. "I want to see this being used," he says. "It has strong use cases in industry, and I'd like to find a way for it to be deployed and make a real difference."

Powering Nova Scotia's Tides

When it comes to renewable energy, the tides of the Bay of Fundy offer tremendous potential. But harnessing all that power isn't easy. Beneath the surface, powerful currents, shifting seabeds, and complex conditions make tidal turbines one of the most challenging forms of renewable energy to design and deploy.

That hasn't stopped PhD students Abiola Akinnibosun and Kenzie Lewis from taking on the challenge. Both are studying how these turbines perform in the Bay of Fundy, how they interact with the environment, and how tidal energy can be made more efficient and cost-effective.

They explain that tidal turbines are essentially underwater wind turbines that spin to generate electricity. Abiola focuses on the turbines themselves, using computational models to simulate turbulent tidal flow and study risk, power generation, and downstream effects.

"If you don't understand the wake, you can't properly design an array of turbines," he says. "You might over- or under-design blades, which can be costly or cause premature failure. Our research guides material selection and array placement to maximize efficiency and reduce risk."

Kenzie's simulations focus on how the ocean environment can impact the turbine performance. By adding the impact of the seabed, she is also able to examine how the turbine impacts sediment transport and marine life.

"Water is almost 1,000 times denser than air, and the channels in the Bay are constantly shifting," she explains. "We need to understand not only if the turbines can withstand the flow, but how they impact the environment. Can fish tolerate changes in flow? Will sediment patterns be altered?"

Although their work is currently based on simulations, both see huge potential in their research.

"It makes me feel like I'm really making a difference," says Kenzie. "I love knowing that my research could eventually be applied in the Bay of Fundy and used by industry."

"Tidal energy here hasn't been widely developed, so there's room to make an impact," adds Abiola. "Nova Scotia has huge potential, and because it's renewable, it causes less harm to the climate."

Solar Power in Unexpected Places

Jesús Gonzalez Navidad is turning ordinary fabrics into electricity that could one day power clothing, tractors, or even umbrellas.

"Maybe while you're at the beach you could even charge your phone," he says, imagining all the ways this groundbreaking research could change how we use solar energy.

A Chemical Engineering master's student in Dr. Ghada Koleilat's lab, Jesús is experimenting with flexible solar cells that are printed onto different textiles. "The fabric we're using is reusable and upcycled," he says. "I love the idea of turning something that's just fabric into a device that can generate electricity. It's exciting to think about the real-world applications and what we can do with it beyond the traditional rooftop solar panel."

Within the last year, the project has significantly grown with new funding and industry partnerships. The lab has also acquired a new aerosol-based printer which lets the team use a coating technique to apply the layers of a solar cell directly onto flexible fabric. This is what makes it possible to convert sunlight into electricity.

"I've been testing it with different chemicals and substrates to see if it's feasible, if it works, and if it's conductive," explains Jesús. "One of the key requirements is that the materials we use have to conduct electricity, so the solar cell can harvest sunlight and convert it into usable energy."

The work involves a lot of experimentation, a lot of problem-solving and a lot of trial and error.

Jesús first discovered this path during a summer Mitacs internship in Koleilat's lab. After returning home to Mexico to work full-time, he received an unexpected email from Koleilat asking him to pursue a Master's degree.

He says that after he completes the degree, he hopes to take what he's learned back to his country. "There is so much potential for renewables, especially solar, but we're not really using it yet," he says. "But that's one of my goals, taking what I've learned or developed here and trying to make it work in Mexico."

Growing the Future of Food

Ghazaleh Afrahi is helping researchers at Dalhousie Engineering rethink the way our food could be produced in the future.

A PhD student in Dal's Circular Process Engineering Laboratory, she is studying cellular agriculture, an emerging field that explores how animal-based products can be produced from cells rather than through traditional farming. While the technology is promising for reducing environmental impacts and strengthening global food security, it comes with significant challenges.

One of Ghazaleh's main focuses is on making these systems more sustainable and affordable for everyone.

"I focus on the environmental and economic aspects of cellular agriculture," she explains. "Specifically, I study how using by-products from agriculture, rather than conventional refined ingredients, can improve the sustainability and reduce the costs of these systems."

Her work is part of an international initiative supported by New Harvest, an organization advancing cellular agriculture research around the world. Although meat production dominates the field today, Ghazaleh is exploring how more efficient inputs could make the technology accessible to a broader range of communities.

"One of the biggest challenges in this field is cost," she says. "Cellular agriculture has the potential to reduce environmental impacts and strengthen food security, but current products are far too expensive for most consumers."

Because the field is still new, limited data adds another layer of complexity to the work. Researchers are still developing methods, testing processes, and building partnerships with the few companies currently operating in the space.

Despite the unknowns, Ghazaleh says there's a lot of potential in the research work that she's excited to take part in.

"I love tackling challenges that actually make a difference, whether it's designing sustainable materials, making digital tools accessible, or advancing research, as long as I can create real, tangible impact."

A SHIFT IN ENERGY

If you had asked Dr. Lukas Swan five years ago what he would be working on today, he never would have said sodium-ion batteries or Nova Scotia's offshore wind future. Yet here he is, leading a groundbreaking project that could redefine how the province harnesses and stores renewable energy.

A long-time electrification expert, Swan has spent decades championing a system where wind and solar power homes, buildings, and charge electric vehicles, with the excess energy being stored in batteries for later use.

"I remember people laughing at me 15 and 20 years ago, saying, 'Natural gas is cheap, or oil will become cheaper, or let's burn wood instead because we have lots of trees,'" he says. "And now people are buying electric vehicles like hotcakes, and virtually all new communities are being built with heat pumps."

Things are changing again. Swan is now turning his expertise toward sodium-ion batteries, a chemistry he has never worked with before. And he's exploring how it could complement or even surpass in some ways lithium-ion for stationary energy storage.

Powering the Future

Funded through the Canada First Research Excellence Fund (CFREF), the seven-year, $1023-million Voltage (VOLT-AGE) grant unites universities, government agencies, industry, and indigenous partners to explore electrification, including batteries. Unlike lithium-ion, sodium-ion batteries use abundant, lower-cost materials and are ideal for stationary applications like grid storage, where size and weight matter less than in mobile application like cars or phones.

Starting with a seed grant just over a year ago, Swan dove headfirst into sodium-ion. "We're learning as we go," he says. "We're running into problems, finding solutions, trying different techniques."

The research quickly expanded, bringing on PhD and undergraduate students and giving them hands-on

experience with partners ranging from Canadian and U.S. companies to defense organizations, Indigenous groups, and public agencies.

To kick things off, the lab invested about $30,000 in cells, from thumb-sized cylinders to shoebox-sized prismatic modules, and began cycling them through rigorous tests of temperature range, voltage range, and real-world load simulations. Their goal: to design modules and packs for stationary storage, powering everything from homes to commercial buildings and the wider electricity grid.

Swan isn't working alone, he's also teaming up with experts at the universities Concordia, Calgary, ETS Montreal, and Carleton, including Faculties of Engineering, Science, and Social Science.

For students, it's a front-row seat to the future of energy. Over the next four years, about 23 PhD students will dive into the project, tackling new technologies and collaborating with partners across North America. "It's allowing them to go off and do their individual PhD research tasks, but recognizing this web of interlinks between sciences and engineering and social science, and drawing them back together to share and collaborate" explains Swan.

Perfect Timing

The timing couldn't be better. With Nova Scotia ramping up onshore wind and solar, and making major commitments to offshore wind, current electrical grids may not be ready for all that extra power.

"We do battery research because we need to store energy," says Swan. "These sodium-ion batteries are exclusive for stationary. That's our focus. We need to store wind and solar energy when there's excess, and release it at later points when the sun goes down, when the wind stops blowing, or when the temperature drops and the heat pumps come on."

He adds that while Asia leads in sodium-ion production, and Europe and China dominate offshore wind, Nova Scotia offers unique advantages: abundant land, strong winds, and a chance to develop domestic battery supply.

"Five years ago, I wouldn't have imagined working on offshore wind and sodium-ion batteries. But that's where I am. We're pivoting fast, filling research gaps, and doing work that's critical for the province of Nova Scotia and the region as a whole," he says.

With this work, Dalhousie Engineering is emerging as a hub for renewable energy research. While the rest of the world has valuable expertise, Swan says their technologies may not be suited for the province's unique conditions.

"Although the Europeans have done a phenomenal job and the Chinese now lead at this point in offshore wind energy, they have not seen a resource like we have here in Nova Scotia," he says. "Our winds are just substantially stronger, and you really need boots on the ground and local research. That's where the fun is for us in our research work."

"We're pivoting fast, filling research gaps, and doing work that's critical for the province of Nova Scotia and the region as a whole."

Bonding over advanced ceramics:

Galina Boubnova and Yasha Boubnov are siblings, and colleagues in the lab

When Galina Boubnova tells people she 3D prints ceramics, they think teapots and mugs. But those are very different from the ceramics she's working with at a Dalhousie University Engineering lab.

"The advanced, technical ceramics we use have unique properties that are really important for a variety of applications," Galina says.

Instead of mugs, she's working with sophisticated materials with medical, military and other uses.

"You could 3D print a bone scaffold to help regeneration if someone has injured a bone, because the ceramics have really good properties for that — good wear properties, hardness and density similar to bone," she says. "They're also used on military aircraft, where the ceramic can absorb high heat and protect the fuselage. And they're used a lot in soft robotics for conductivity."

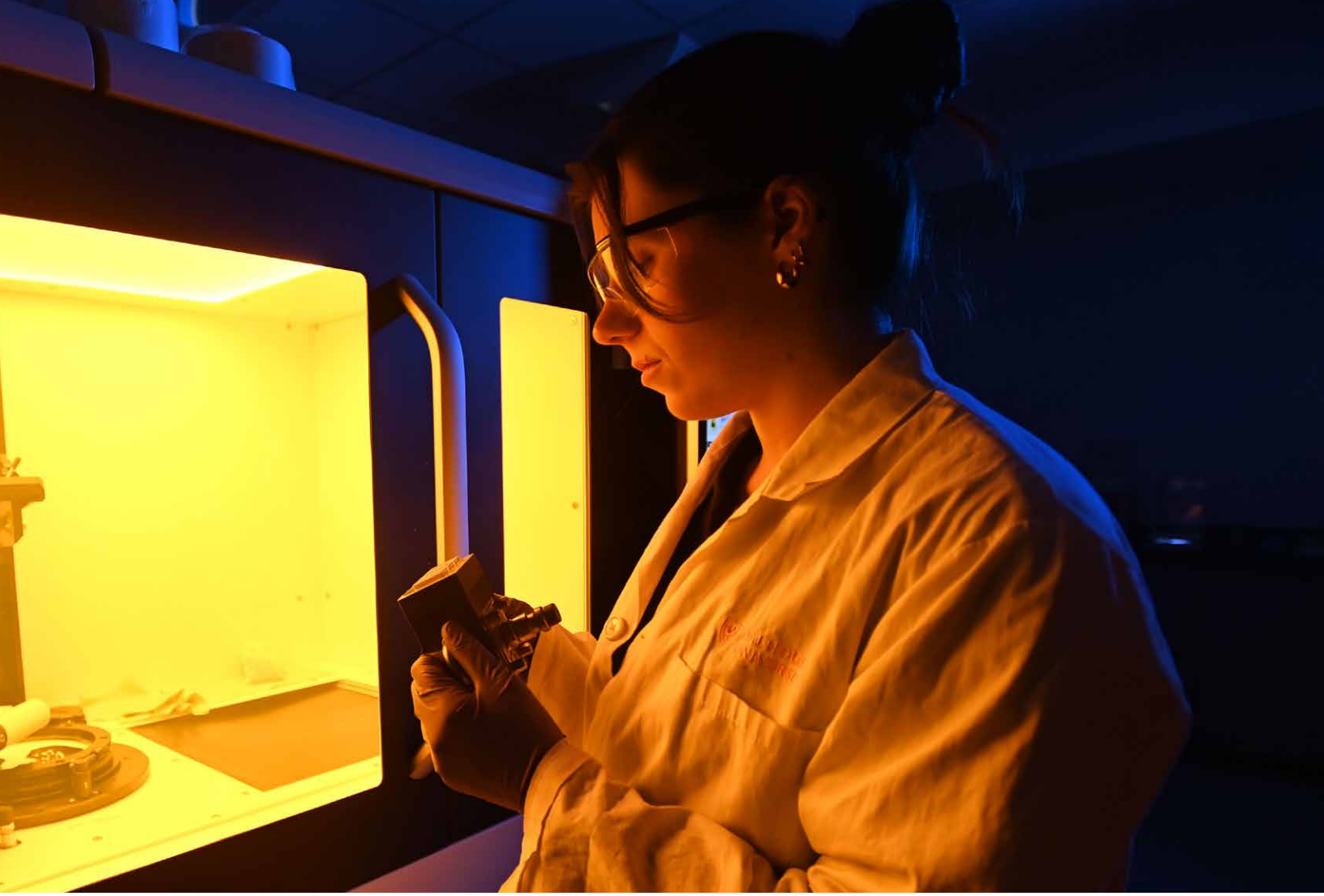
A Master's student in Mechanical Engineering, Galina is supervised by Dr. Kevin Plucknett and works in his lab. It received a $9 million grant from the Canada Foundation for Innovation, allowing the lab to purchase sophisticated 3D ceramic printers made by Lithoz. They are the first printers of their kind installed in North America, and the only ones in Canada.

One of the focuses of the lab is eliminating barriers to the manufacturing of advanced ceramics, which can be expensive and complex.

Last summer, one of Galina's colleagues in the lab was her younger brother, Yasha Boubnov. An undergraduate Mechanical Engineering student, Yasha received an Undergraduate Student Research Award through the Natural Sciences and Engineering Research Council of Canada (NSERC), which funded his work. ("Yasha's super-smart," she says.)

For some people, working with a sibling might sound like a nightmare, but Yasha said it was "really great." He got relevant lab experience and an opportunity to learn about different fields. "And having her there was great, because she was in the same position I was in two years ago. She was very much able to mentor me through the processes; she knew how to use the confocal [microscope] and the printers. I got to learn a ton, and it was a really cool environment."

Yasha worked primarily on 3D printing ceramic parts from a slurry of ceramic powders and polymers. The components are built layer by layer and cured with mirrors and lights before the polymer is burned off, leaving only ceramic. After



printing, his responsibilities included "doing all the post-processing and then using imaging techniques, like the scanning electron microscope and the confocal, to examine these parts in different stages."

"With this technique, you can 3D print very tiny things with an immense amount of detail," Galina adds.

Galina also got her start in the lab as an undergrad, volunteering to get some experience. She calls Dr. Plucknett "a super-super-generous professor." He offered her a summer position before the last year of her undergrad, kept her on the next summer, and then hired her as a Master's student as well. The first summer, she worked with a doctoral student doing research on an oxide ceramic called alumina. Then she moved on to a National Research Council project, printing multi-materials, which she describes as "really cool for some biomedical applications, because you can mimic a material that's found in nature."

"We worked together in the same lab and did the same research... Not all siblings get to experience that. It's a really special and unique experience."

GALINA BOUBNOVA

For her Master's, she has continued working with multi-materials and alumina, "adding different additives to toughen the material, to see how the different additives compare to the regular alumina."

Yasha says getting this kind of lab experience is one of the things that drew him to Engineering at Dal, when he was considering university programs. "The first year Engineering program was so diverse. You took physics, chemistry and math and get a more general understanding of a lot of fields. Dal is just so diverse, and I really liked that environment."

And as for Galina, she says she is "really grateful" for the experience of working with Dr. Plucknett, and with her brother. "We worked together in the same lab and did the same research. That's super special! Not all siblings get to experience that. It's a really special and unique experience."

The beating heart of research: Capstone students' research could help save lives of people with cardiac arrhythmia

Creating something that could help humanity may seem like an ambitious goal for an undergraduate project, but that's exactly what a team of Dalhousie University electrical engineering students hopes their capstone project will achieve.

"We took this biomedical project because we're interested in the bridge between electrical systems and the human body," says Ispeeta Ahmed, "and trying to create something that could help humanity."

For their Capstone Project — supervised by Professor Sergey Ponomarenko — Ispeeta, Cassie Norman and Orion Wiersma worked in Professor Alex Quinn's Cardiac Autoregulation and Arrhythmias Laboratory. Their research involved using LED light to stimulate the activity of zebrafish hearts. (Zebrafish hearts are often used in arrhythmia research, because they beat in a way that's similar to the human heart.)

Ultimately, their findings could help lead to new treatments for a form of cardiac arrhythmia called Long QT Syndrome.

Cassie explains: "Your heart basically is a mechanical pump, but it's electrically driven. So when your heart isn't beating properly, a lot of the times you can trace that down to the level of the electrical signal in the cells in the heart, in order to figure out what's causing that."

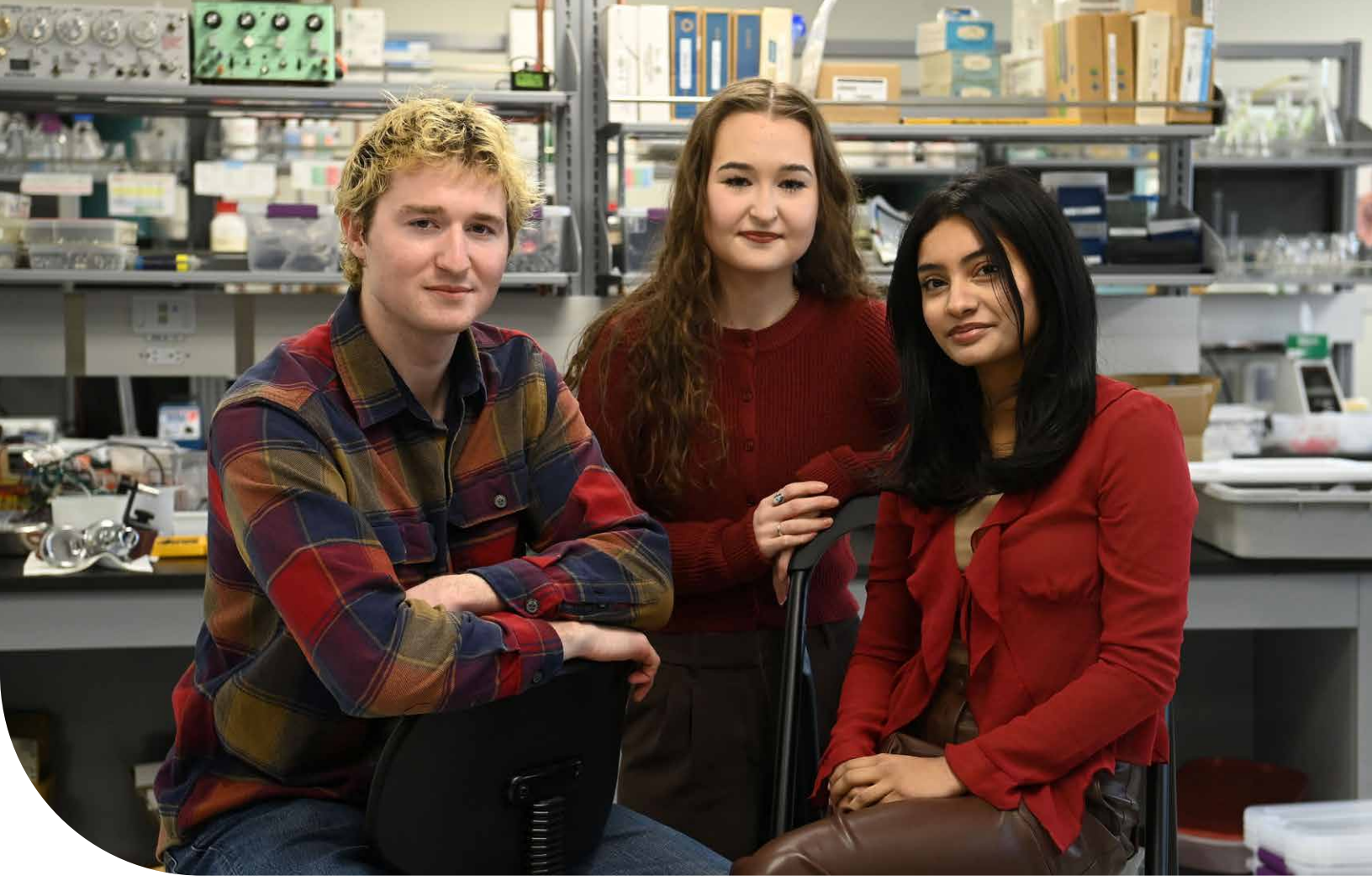
For people with Long QT Syndrome, those electrical pulses last too long. The Capstone Project, which is called, "LED Feedback System for Optogenetic Control of Cardiac Electrical Activity," uses light to try and shorten those pulses, but without affecting the shape of the heart as it beats.

"We took this biomedical project because we're interested in the bridge between electrical systems and the human body."

ISPEETA AHMED

The research is part of a revolutionary new field in neuroscience called optogenetics, which, the Quinn Lab says, "entails the control of cellular activity with genetically-encoded light-activated ion channels and pumps."

"We're basically trying to modulate the light that you have to use in the optogenetics experiment." Ispeeta says. "So, it's a lot of MATLAB [a programming language], a lot of coding. We're stimulating an actual heart in real time. And then we're creating a controller system that can modulate the heart in real time."



Numerical modelling was key to the project, creating a computational model that ultimately drives the light to turn on at the correct intensity. That modelling made it possible to move beyond simulation, to a fully functional system where light could be controlled by the algorithm.

“We see a genuine pathway for this to be in a medical technology in our lifetimes.”

CASSIE NORMAN

If the process works, it could ultimately lead to implantable devices that can save human lives. “We see a genuine pathway for this to be in a medical technology in our lifetimes,” Cassie says.

The Capstone Project provided invaluable skills and opportunities beyond the research itself. “It's taught me a lot about not only the technical work, but also the communication aspects,” Orion says. “Being able to present our work, and to collaborate with peers outside of our department as well. It definitely taught me a lot about that, and I'll probably apply those skills in the future.”

For Ispeeta, the communications aspect was important as well. “Our work is technical, right? So to be able to communicate it in a 15-minute presentation, make sure that everybody understands, and make sure we can answer the questions correctly — I think that's something that's really important in any science career.”

Asked about the most important thing that she got out of the project, Cassie says, “I have a good answer to this, because I was about to graduate in eight months when I started in this lab, and now I'm pretty convinced I'm going to do a master's in this lab, working on this project, because I really, really love it.”

“It's taught me a lot about not only the technical work, but also the communication aspects.”

ORION WIERSMA

She adds, “It's totally different to take things from the classroom and actually use control theory in real life. There's a learning curve to that, and Capstone does a really great job of making you feel far more confident, going into whatever you may do in the future.”

MAKING THE IMPOSSIBLE FLOAT: Dalhousie's Concrete Canoe Team Paddles Back into Competition

Will Sayson can already imagine the sense of pride he'll feel when he's sitting in the middle of a lake, in the concrete canoe he and his team have built.

Seems impossible, right?

For the fifth-year Dalhousie Civil Engineering student, it's a moment he's been dreaming about since he and a group of fellow students revived Dalhousie's Concrete Canoe Team earlier this year. The team is a student-led design group dedicated to turning hands-on civil engineering concepts into reality. Their goal: To design and build a 20-foot-long canoe, made of concrete, that doesn't sink.

"When people think 'concrete canoe' it's a bit of an oxymoron," laughs Will. "But those huge container ships are thousands of tonnes and they still float."

He explains that their canoe floats not only because it displaces water like any other boat, but also because the density of their concrete mixture is carefully engineered.

The Challenge

The team, however, is racing against the clock. They only have a few months to prepare for this year's Canadian National Concrete Canoe Competition (CNCCC).

As captain of the team, Will oversees every aspect of the project, from early design discussions to recruitment and construction planning. Unlike other design teams within the Faculty of Engineering who typically have over a year to build their prototypes, Will and his teammates need to build their concrete canoe all within the same academic year as the competition. That means everything needs to be ready to go before this spring.

"Even before the team was official, we were already brainstorming design and taking stock of our resources," he says. "Once recruitment started, we were surprised by the amount of interest from students in both the diploma and the upper division of engineering."

The team now includes more than 40 members, many of them first-year engineering students eager to gain hands-on experience early in their university careers.

The Design

From choosing the perfect concrete mix to selecting materials that balance strength and buoyancy, Will and his teammates are putting everything they've learned in their civil engineering courses to work on the concrete canoe. Structural design, material science, and fluid dynamics all play a role in making sure that the canoe not only floats but can also race successfully in competition.

"The canoe will be made from materials such as lightweight volcanic rock, recycled glass, expanded polystyrene, micro-fiber reinforcement, a basalt mesh, as well as an innovative carbon-negative admixture," says Will. "The combination of these materials keeps us afloat, the boat structurally stable, and even reduces our carbon emissions."

The team will also be able to draw on the experience of past Dalhousie Concrete Canoe teams who have competed in national competition.

"We're glad to have revived a design team with such a rich history at Dalhousie. The old generations of the team won bronze nationally in 2005 and hosted the competition right here in Halifax in 2008," he says. "We're very proud to carry on the legacy after the team stopped operating due to COVID."

The Competition

The CNCCC brings together university civil engineering teams from across Canada to test their designs, technical reports, presentations, and, of course, their canoes on the water. To win, a canoe must float when fully loaded and meet strict construction and safety rules.

Teams race off in sprint, endurance, and co-ed races, while overall standings are decided by a mix of design innovation, technical reporting, presentations, and race results.

"The team is very excited to compete in the competition for the first time in 6 years. We can't wait for the moment we see our concrete canoe racing through the water."

This year's competition will take place in mid-May in Moncton, New Brunswick. For Will, the location holds special meaning as he prepares to compete close to home while representing Dalhousie on a national stage.

The Path

Originally from New Brunswick, Will came to Dal in 2021 looking for something new. He wanted the experience of living in a different city and meeting new people, without being too far from home.

Before choosing engineering, he considered a future in the military, though his strong interest in physics and problem solving won out. The part that interested him the most was the opportunity to work in a career that offered a balance of hands-on field work and office-based design.

That mix of theory and practice is also what drew him to student design teams. In 2023, he joined Dalhousie's Solar Car Team, where he remains a member and supports the team through social media and communications work. It was that experience that helped him realize that something was missing within the Faculty of Engineering.

"Despite already being involved in design teams, and going into my final year, I was craving some more technical experience that was related to my discipline," he explains. "Coincidentally, a few of my peers felt the same. Upon checking the Dalhousie website for other opportunities, I stumbled across the past design teams' section and found concrete canoe. I floated the idea to my friends, and we began speaking to the department to gauge the practicality of reviving the team."

Although it's been a significant time commitment, Will says launching the Concrete Canoe Team has been well worth it. The hands-on experience gained through the project has even helped him secure a position with a construction company in New Brunswick, where he plans to work as a project coordinator after graduation.

"Joining design teams has been such a great experience for me, it's just like the regular societies, but with an extra hands-on aspect that is directly tied to my studies and future career," he says. "What really makes it are the other students on the team and close-knit community that begins to form. We are very happy to have revived Dalhousie's Concrete Canoe Team and are all looking forward to seeing our team's hard work in action when we once again head to competition in May."

RUNNING ON SUN: SOLAR CAR TEAM GETS READY TO RACE

A car driving 65 km/h, running entirely on a solar-powered battery. That's an achievement members of Dalhousie's Solar Car team have pulled off in the past, and they hope to match or improve on it, with a brand new car they are building now.

Every year, students from across North America participate in the Formula Sun Grand Prix solar car race, organized by the Innovators Educational Foundation. Dalhousie students have been there twice, in 2023 and 2024.

For those races, the Dal team modified a car they'd bought, outfitting it with a new, custom-built battery pack, new wiring, and a refurbished solar array. But now, the Solar Car team is "switching gears" to "see what we can come up with and push the technology forward a bit," says co-team lead Noah Bugden. They've decided to build their new car from the ground up.

Noah says the vehicle will use some components from the team's previous car, "but the whole chassis, solar array and most of the small components will be redesigned and replaced." Instead of carbon fibre, the new car's chassis will be made of steel tubing, which is a bit heavier. "We're OK with that because we know we can build it, and Dal has experience making this kind of chassis," says Noah, a Mechanical Engineering student.

The car will be powered by a battery made up of 420 cells, producing 120 volts. The rest of the design is pending approval by tech inspectors in the United States, where the race takes place. "Once that point comes, we can order the material, have it show up, and start manufacturing it," Noah says.

The team is multi-disciplinary and consists mostly of engineering students based at Dal Engineering's Sexton Campus. There are all kinds of roles available, including design, mechanical, electrical, operations, and branding, sponsorships and social media management.

August Holder, the team's other co-lead, is an Environmental Engineering student who has learned skills like soldering and working with carbon fibre through the Solar Car team. But she says the value of belonging goes beyond technical skills.

In fact, it may have helped keep her in university.

Early on during her time at Dal, she struggled to find her footing, and considered dropping out. She says Solar Car "is a huge reason" why she stayed in school. "It was like a tether to keep me in the program, and on campus. I always had a core group of friends on the Solar Car team to keep me accountable to my work," she says. "Our team is very close-knit and very supportive of each other." How close knit? They get together off campus too, even going on group hiking and camping trips.

When she speaks with new students, August encourages them to participate in activities like Solar Car. She says one of the University's strengths is the number of teams and groups available, and that it's important to "have an identity on campus other than just being in your classes."

The new Dal-built solar vehicle is expected to run its first race at the 2027 Formula Sun Grand Prix.

SAWS, FLAMETHROWERS, AND SUPER-HARD MATERIALS:

Dalhousie's first combat robotics team prepares for action

A robot with an extendable arm that shoots flames. Armoured bots with deadly spinning saw blades. Welcome to the intense world of combat robotics, where custom-built bots try to take each other out, by any means necessary.

Founded in 2024, Dalhousie's first-ever combat robotics team is aiming to put their homemade robot to the test in at the National Havoc Robot League world championship qualifier, to be held in Connecticut in October 2026. Its main sponsor is Lockheed Martin.

Jack Brown, a third-year Chemical Engineering student, is the combat robotics team lead. At the competition, "There will be hundreds of three-pound robots, and we don't know what we'll be up against," Jack says. "But there are a few archetypes of bot: one with a vertical saw blade, which is what ours is, one that shoots fire at you, one that tries to flip you, and one that has a blade like ours — but it's on an arm."

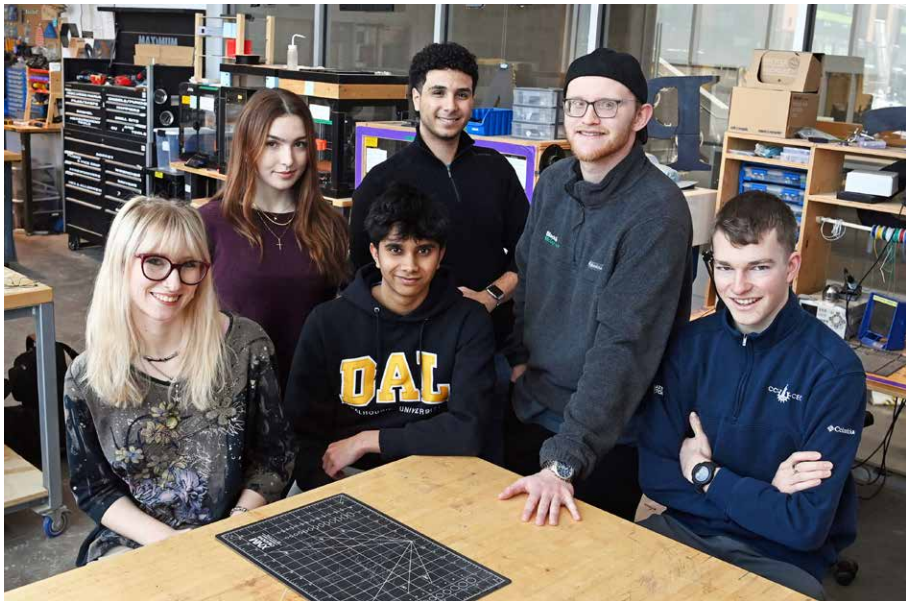
He says designing and building a fighting machine is a great way to study adversarial engineering ("Building something with the assumption that someone's going to try and break it"), and provides training for real-world applications.

Combat robotics seemed like a natural extension of his first-year design project: building a robot that would fire a hacky sack at a target. Once he'd completed the project, he got to thinking about taking it farther. "What if we made this out of steel? What if we made it three pounds? What if our goal was to make it as durable as possible? And what if we did away with this catapult and put a saw blade on it?"

Jack says he was drawn to study Engineering at Dalhousie in part because of the Faculty support for extra-curricular projects, and the diversity of the student body. "Diversity is great. We want to include as many people as we can, and by definition it's going to include people who come from different backgrounds and are going to think in different ways. And there's tons of support for whatever you want to do. That's why I like Dalhousie, and Dalhousie Engineering specifically."

The battle bot is still in the design stage, but the team, which currently consists of six people, has decided on the design and materials: titanium, nylon, and super-hard AR500 steel. Most battle bot competitors use off-the-shelf RC controllers to pilot their machines, but the Dal team are building their own, based on a PS5 controller. "We're doing everything custom, and that's the biggest challenge," Jack says. But it also gives the team an advantage. "We can switch the controls to whatever the pilot wants, and we'll have two-way communication — so not only can we send commands, we can also receive back information from all the sensors we have on the bot."

Jack hopes all their research and preparation will pay off once they're in the combat ring in Connecticut. But ultimately, no matter what happens, being on the team is "tons of fun," he says.



Engineering Change from Coffee to Coastlines

Two ambitious ventures. One already scaling internationally; the other still deep in prototype development. Both companies began when their student founders saw potential in undervalued resources, and both demonstrate how early-stage engineering support can drive high-value innovation.

At the Emera ideaHUB, RFINE and Equlantic have tapped into an ecosystem of mentors. Through programs like ideaBRIDGE and ideaBUILD, they have learned to apply rigorous design processes to transform early ideas into engineered prototypes and launch ventures with global potential.

RFINE Biomass Solutions Inc.: Turning Grounds into Good

For RFINE President and founder Quinn Cavanagh (MASc. ’24), the entrepreneurial journey began during his undergraduate co-op work term.

While working as an intern, he was tasked with emptying the wet grounds from the office coffee machine. “I was struck by how much coffee we were throwing out as a small office of 15 people,” Cavanagh recalls. “This was perfectly usable biomass.” According to RFINE’s market analysis, more than 60,000 tons of spent coffee grounds are generated worldwide each day.

That insight grew into RFINE, a cleantech venture upcycling spent grounds into KAFFIKA™ Cocoa Extender, a sustainable and delicious cocoa alternative.

Yet the path to entrepreneurship is never straight, as Cavanagh attests, “I started with collecting spent coffee grounds to make brownies for Halifax coffee shops. But it wasn’t long before I realized the high costs and inefficiencies of having to drive all around the city to manually collect, dry, process, and deliver my product.”

In search of a better way, Cavanagh shifted his focus to designing a drying system that reduces water weight and enables safe, cost-efficient collection of spent coffee grounds. His market research showed that coffee shops were spending $6,000–$12,000 annually to dispose of wet coffee grounds. But to go from an idea to manufacturing a drying system required engineering expertise beyond Cavanagh’s chemical engineering background.

That’s where ideaBRIDGE became essential. Cavanagh credits his early residency days at the ideaHUB with providing the design

support needed to build a compact unit that dries and stores grounds in food-grade containers for lightweight backhaul transport.

"The ideaHUB gave us a real design pathway," he says. "I had the vision, but the HUB provided the tools, engineering expertise, and mentorship."

"I had the vision, but the HUB provided the tools, engineering expertise, and mentorship."

QUINN CAVANAGH

Fast forward two years and RFINE is part of CDL Atlantic. The company successfully operates both in-store and industrial drying divisions, diverting about 250 tons of spent coffee grounds each month for use in food ingredients and other applications. With cocoa prices at record highs, RFINE is positioning itself as a key player in sustainable food innovation, turning waste into a circular economy success story.

Equlantic Aquatic Monitoring Inc.: Turning Samples into Solutions

Equlantic, at the start of its entrepreneurial path, is developing the AutoSampler – a compact aquatic monitoring system.

The idea originated when the student team won $10,000 at the Mission Innovation SMART CDR pitch competition in Norway, proposing a unique solution to meet water quality monitoring needs in the marine carbon dioxide removal (mCDR) industry.

According to Canada's Ocean Supercluster, the fast-growing mCDR industry could help reduce the negative impact of ocean acidification and may become as big as Canada's electric utility sector, attracting $30B in investment and creating 90,000 jobs by 2050.

With massive market potential, Equlantic's competitive advantage comes from a multidisciplinary team. Its founders and engineers include Will Myrer (BEng '27), Isaac Bahler (BSc. '26), Rowan Norrad (BSc '26), Caliyena Brown (MSc. '28), Cameron Richardson (BSc.'23), Dylan Moore (BEng '27), and Gregor Deveau (BEng '26) – who bring diverse academic backgrounds in earth sciences, environmental sustainability, marine biology, and mechanical, electrical, and computer engineering. This range of perspectives fuels creativity but also requires careful prioritization.

After more than 30 customer interviews, they found there was widespread frustration with existing monitoring systems. "mCDR companies run on data, but the tools haven't kept pace," says Equlantic co-founder Will Myrer. "Size, simplicity, and durability matter most."

Their first prototype, built quickly for Dal Innovates Demo Day, showed promise but needed a more rigorous engineering environment. Through the 10-month ideaBUILD program, they are refining mechanical, electrical, and software components. "ideaBUILD helps us break big problems into buildable steps," Myrer says. "That structured approach saves us months of going down the wrong technical paths," adds Dylan Moore, Equlantic's embedded systems engineer.

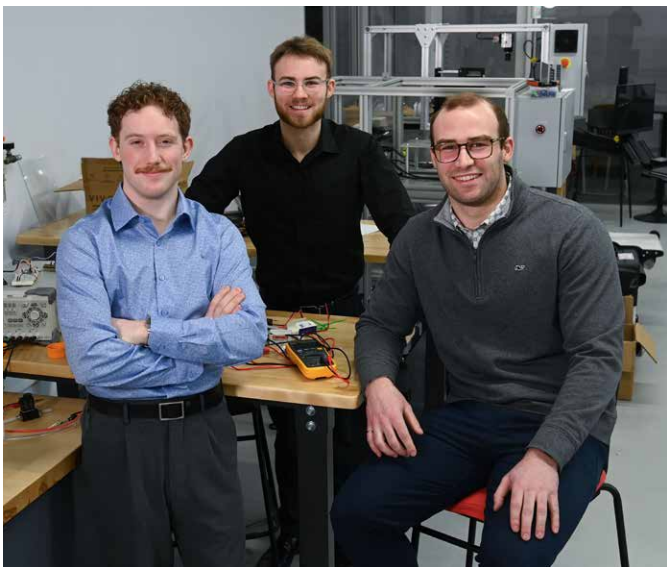
"ideaBUILD helps us break big problems into buildable steps."

WILL MYRER

With support from the ideaHUB's lead engineer, Danielle Maltais, Equlantic has streamlined their system from 28 sample points to seven optimized ones. They are now testing underwater housings, integrating a printed circuit board system, and simplifying the user interface. "The AutoSampler has to survive real world conditions," says Gregor Deveau, Equlantic's electrical engineer. "The ideaHUB's prototyping support has been a game-changer."

With field testing ahead, Equlantic is preparing for pilots and partnerships within Nova Scotia's fast growing mCDR sector.

Whether scaling globally or iterating prototypes two, three, or six times, founders connected to Emera ideaHUB gain the structure, discipline, and technical foundation needed to turn early ideas into high-potential solutions.



Out of the Office: Tolue Gholami's co-op placements took him from remote logging roads to the lab

When Civil Engineering student Tolue Gholami was looking for co-op opportunities, one job stood out to him immediately. It was a posting for a hydro dam safety surveillance intern at energy company TransAlta, based in Calgary.

Born and raised in Halifax, Tolue had been thinking about moving out West, and a co-op in Calgary would give him a chance to test-drive the city. Plus, TransAlta was offering something else that appealed to him: a chance to "get outside, do work with my hands, and not be in the office all day."

It was a good choice. He liked his first placement so much, he stayed with the company for all four of his co-op terms.

TransAlta manages 10 dams in Alberta, and Tolue's work involved heading to remote sites to inspect dams— some of them so remote he had to cut trees fallen across the road to get there.

Dams require a lot of care and maintenance, and he appreciated the range of experiences that came with the job. Everything from draining a canal (and collecting fish to keep them safe), to measuring water pressure, recording seepage, and checking for human and animal activity. "I'd go from talking to a contractor about dealing with beavers in the river one day, to doing an inspection and looking for cracks in the dam the next. It was a whole variety of things."

While some of his placement involved chainsaws and shovels, there were more technically advanced projects too. One of them saw him driving from site to site with a contractor, using a LIDAR 3D drone to study the composition of rock deposits. "It was cool being on the front line of things that are new in the industry and finding out how they work," he says.

Now in his last semester, Tolue is back in Halifax and planning his next move. He says doing co-ops in a different part of the country was an invaluable part of his education, and he recommends it for other students.

He says, "Especially if you have a long run like we do in civil engineering, if you have over a year to go try a city out, I think that's the best experience you could have. It's long enough that you can really get comfortable and make the place your home for a little bit. But at the end of the day, it's got that expiration date on it, so you're never married to a spot and there's that safe sense of returning home at the end."

Tolue adds, "I thought that was the best experience for me overall. Moving out to a new city, meeting new people, and getting to experience new things."

"If you have over a year to go try a city out, I think that's the best experience you could have."

Developing renewable energy projects — on land and offshore

When David Frost started his Environmental Engineering degree at Dalhousie, he didn't expect his education would include going to sea, or helping to run public consultation sessions. But, he says, one of the advantages of Dal Engineering is "access to some very interesting and niche opportunities."

David, who is in the final term of his undergraduate studies, has a strong interest in renewable energy. He spent all three of his co-op terms working in the field — one of them with the federal government's Bedford Institute of Oceanography (BIO), and the other two with Nova Scotia-based renewable energy company Natural Forces.

At the BIO, David worked on a project sampling and analyzing sediment from the ocean floor. It's an important step in determining where to site offshore wind farms. He had expected to spend the entire co-op in the lab, but when he was asked to take part in a 17-day sampling expedition off the coast of Nova Scotia, he couldn't refuse.

For someone who hadn't been to sea before, "It was definitely a bit daunting," David says. "But it was such a good opportunity, and so interesting, I just couldn't turn it down. And it was a very good experience, for sure."

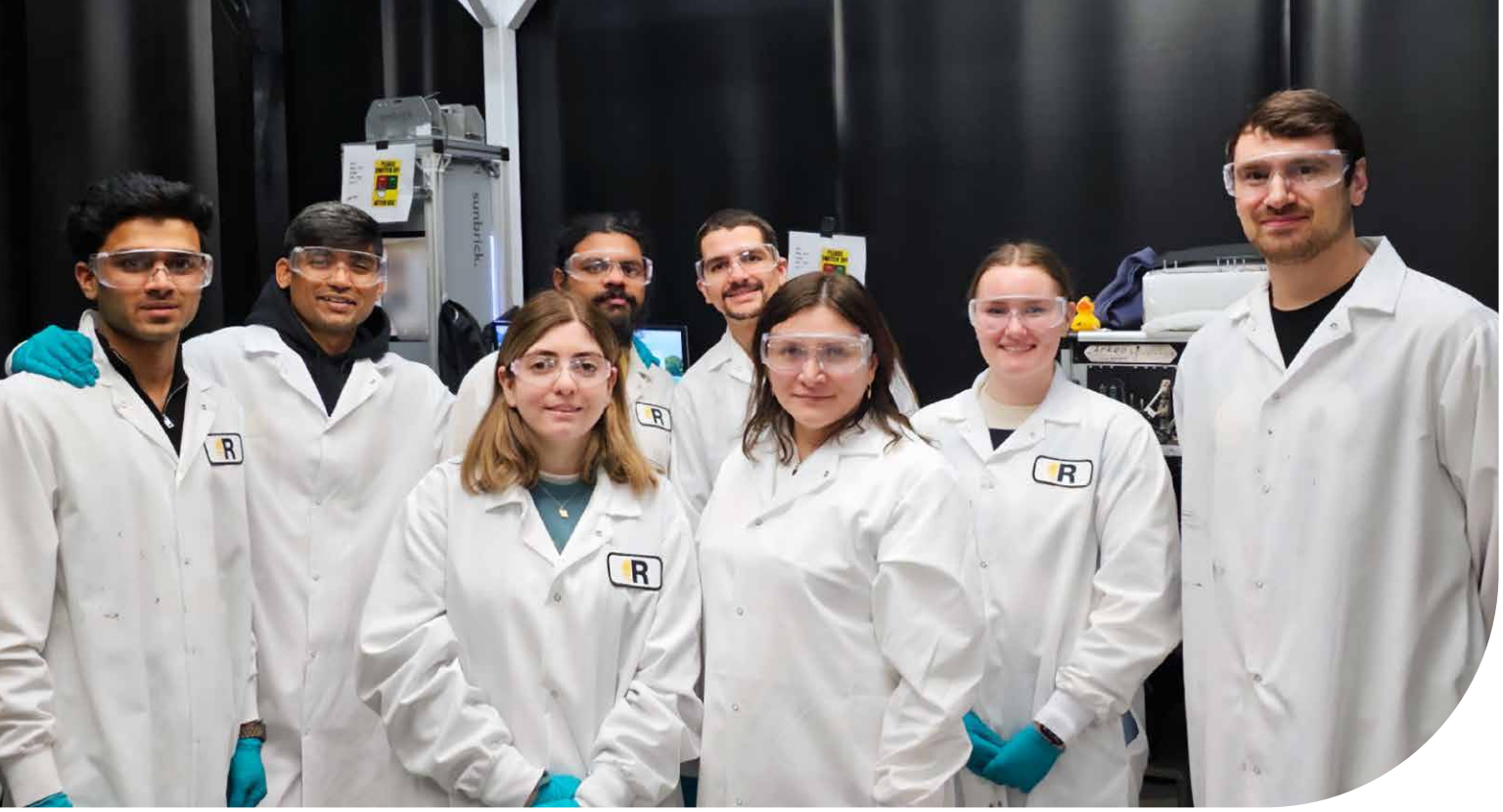
His next two co-ops were on shore, working with Natural Forces as part of their engineering design and project development teams.

Natural Forces develops wind and solar energy projects, often in partnership with First Nations communities. David spent his first co-op with the company working on the technical aspects of solar systems, including, he says, "electrical design, sizing different system components, and looking at system capacity for rooftop mounts and ground mounts, trying to figure out how to best optimize systems."

Because some of these projects were part of Nova Scotia's Community Solar program, David transitioned to the company's development team, with roles that included everything from site-finding to managing sub-contractor relations — and consulting with the public on various aspects of the projects.

The public engagement sessions allowed him to connect with people who would ultimately be benefiting from the projects he was helping to design. "It was great, because there was an overwhelming sense of acceptance and support for the projects. People are definitely interested in clean energy, and they like that it's not super-invasive, and they appreciate the ability to be consulted, and have their questions heard."

When David came into the Dalhousie Environmental Engineering program, he was already interested in a career in renewable energy. And as he nears the end of his degree, he's glad to have been able to pursue that passion in his co-op placements. "I found all of the experiences during my time in the co-op program very valuable in building technical and workplace skills," he says. "There are a lot of economic opportunities in the field, and it's something you can feel good about doing at the end of the day. You're working towards a better future. That's a large driver, for sure."



HARNESSING THE POWER OF RENEWABLE ENERGY

Paige Chahley's Experience with Rayleigh Solar Tech

Paige Chahley enjoys the hands-on aspects of engineering, especially when it comes to problem-solving and designing systems. "I'm especially interested in the power and control areas of electrical engineering."

The fourth-year Electrical Engineering Co-op student is currently completing her second work term at Rayleigh Solar Tech. As a Solar Electrical Testing Intern, she's helping develop perovskite solar modules. "Compared to traditional silicon solar cells, they are thin, lightweight, flexible, and low-cost," she says. "The team is constantly testing, designing, and improving both the solar modules and the equipment used to evaluate them, to increase efficiency, reliability, affordability, stability, and overall sustainability."

Paige's team mainly focuses on the stability of the solar modules. "Our goal is to ensure that solar modules can withstand various environmental conditions over extended periods of time without significant loss in performance," she says. "I have contributed by creating and setting up testing systems and various programs to evaluate and analyze how solar cells perform under different conditions."

Paige's interest in renewable energy began developing before her time at Rayleigh. "I completed two summer internships at Versant Power, a utility company in Maine, where I had the opportunity to work with various aspects of the power grid, including renewable energy integration," she says. "Through this work, I saw firsthand the growing demand for renewable energy and the real impact it has on the power grid, which first sparked my interest in the field."

Her interest in the field continued, and she became increasingly interested in the technical challenges associated with renewable energy, including grid integration, increased fluctuations between power generation and consumption, increasing demand, and accommodating new and emerging technologies. "This, combined with the goal of contributing to a more sustainable future, motivated me to explore renewable energy further through my studies and work experiences."

Paige is not only growing her technical skills at Rayleigh, but also her confidence.

"I'm developing professionally through regular opportunities to present my weekly progress and receive constructive feedback. This has helped me improve how I communicate technical information and present my work in a clear, effective way," she says. "Rayleigh encouraged me to take ownership of tasks and explore my own ideas, which strengthened my critical thinking and problem-solving skills, especially when designing new testing systems or troubleshooting and improving existing setups."

"I've seen the dedication and passion the entire team has, not only toward meeting their goals but also toward contributing to a more sustainable future through renewable energy. The team is highly committed, collaborative, and supportive of co-op students, which made this a rewarding work experience that I'm proud to be part of."

When asked what advice she had for other co-op students, Paige encouraged students to be open to new opportunities. "Keeping an open mind allowed me to explore new areas and learn what I genuinely enjoyed," she says, "You don't need to have your entire career path figured out going into your first co-op, use these experiences as an opportunity to explore different fields and find work that you're passionate about."

DID YOU KNOW?

Fast facts about Engineering at Dal

Students who start their studies at Dalhousie are considered **Bachelor of Engineering** students from day one. Students who begin at one of our Associate Universities officially become Bachelor of Engineering students when they transfer to Dalhousie Engineering in their third year.

Students interested in healthcare or medical science can add a **Certificate of Biomedical Engineering** to many of our engineering disciplines. Biomedical Engineering applies engineering principles to medicine. Students in their field help design technologies such as medical imaging systems, prosthetics, diagnostic devices, and other tools that improve patient care.

Dalhousie Engineering is the **largest engineering school in Atlantic Canada**. Our students benefit from top-ranked programs, hands-on learning opportunities, strong student supports, and access to groundbreaking research.

Artificial intelligence won't replace engineering jobs. It's just another tool in your toolkit. Engineers are always going to play an essential tole in creative problem-solving, designing complex systems, and ensuring new technologies are safe, reliable, and beneficial to society.

Physics 12 is a must for first-year Engineering. Without it, you won't be able to start your engineering degree. If you're still in high school and haven't taken Physics yet, now's the time. Physics provides the foundation you need to succeed in all engineering courses.

More Than a Game: Students Score Big for Community

Each year, Dalhousie Engineering and Dalhousie Commerce face off in a hockey game that has become about far more than rivalry.

Now in its fourth year, the Eng vs. Comm match-up has grown into one of the university's most impactful student-led traditions, bringing together competition, collaboration, and community. This year's match-up ended in a narrow 4–3 victory for Dalhousie Engineering, but the most meaningful result came off the ice, with $75,000 raised in support of the Canadian Cancer Society and The Lodge That Gives in Halifax.

Organized by students from both Faculties, the annual event continues to expand in both reach and impact. Through their ongoing partnership, Dalhousie Engineering and Dalhousie Commerce students have now raised nearly $300,000 in support of these organizations, demonstrating what student leadership and strong community support can achieve.

The success of the game is driven not only by those who organize and participate, but also by the network of donors, partners, and supporters who continue to stand behind it.



HALIFAX
McDONALD'S
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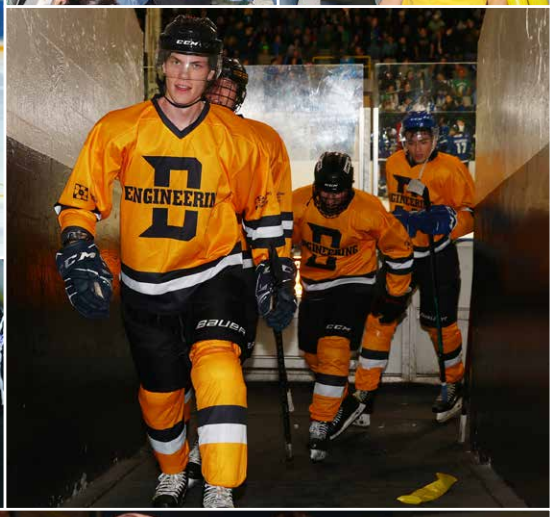
ENGINEERIN


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GO
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How EngiQueers is Changing Engineering at Dalhousie

When Rowan Pratt (they/she) first arrived at Dalhousie University in 2017, life as an engineering student felt overwhelming. At 19, they had never lived on their own, was struggling to manage their coursework, and didn't know yet that they were living with ADHD.

"There were just too many moving parts," they admit. "I ended up failing my second semester, went home to Ontario and felt really ashamed. I didn't tell anybody."

During that time, Rowan was also quietly figuring out who they were. They hadn't yet realized they were queer and spent much of their energy trying to fit into what they thought a woman in engineering was supposed to look like.

"I made friends out of necessity rather than genuine connection," she says. "Honestly, I was just trying to survive."

Nearly a decade later, Rowan's life looks very different. She is now a mother to a baby girl and is preparing to complete her engineering degree. They also re-founded the Dalhousie EngiQueers Society, a student group that has reshaped what community and belonging look like for 2SLGBTQIA+ students on Dal's Sexton campus.

Finding a Place to Belong

For Anna Yaung (she/her), that same society has become a lifeline. Now co-president of EngiQueers, she remembers feeling the same uncertainty Rowan had when she began her engineering degree in 2020. Originally from Windsor, Ontario, she chose Halifax after touring campus with her father and falling in love with the city.

But, once classes began, the transition was harder than expected. Although it seemed like many students had found their path, Anna felt like she was still trying to find her way.

"I feel like in my undergrad I was definitely a late bloomer," she says. "In a similar way to Rowan, I was also just kind of struggling to stay afloat, managing all my classes and keeping myself going."

It wasn't until she discovered Dalhousie's EngiQueers chapter that things began to change.

"That's where I've been able to find my family," Anna says. "Some of my closest friends in engineering have come from this society."

Once she found a place to belong, she gained the confidence to step forward as a leader within the Faculty.

A Second Chance

But the society's return to campus almost never happened.

"The chapter fell through in 2017," says Rowan. "And at the time, I was actually more involved with jack.org because I was trying to find my community," Looking back, as someone who is non-binary, I realized that (societies such as) Women in Engineering wasn't a fit for me."

After returning to Ontario following their second semester, they confided in Dal Engineering Student Engagement Coordinator Karyn Hemsworth and received the support they needed to stay in the program.

Then, in 2020, a few students began encouraging them to revive the EngiQueers Society. After some hesitation, they agreed.

"Honestly, for a while I felt like I wasn't queer enough to be leading something like EngiQueers," she confesses. "Which is kind of funny, and kind of queer-phobic in itself."

They pushed those thoughts aside and set to work relaunching the group. After attending an EngiQueers Canada conference and connecting with the national organization, they gained access to mentorship, structure, and a wider network of support. Soon after, they teamed up with Quinn Stanley, and the two became co-presidents.

Building Community

Today, EngiQueers builds connection and visibility across the Faculty. The society creates a welcoming space for 2SLGBTQIA+ students through a mix of social, educational, and professional initiatives. From study sessions and movie nights to drag shows and Pride events, EngiQueers has done an exceptional job fostering community while also making sure students feel seen, supported, and celebrated.

Following the same framework as the national organization, the society focuses on three key pillars: professional development, education and advocacy, and social connection. This year, the group is placing a stronger emphasis on career-building opportunities, including plans for a queer-focused networking mixer with engineering firm CBCL Limited.

"They're one of our biggest supporters," says Anna.

The society has also partnered with other groups on campus to raise its profile and let students know who they are. They

make a point of attending community events and all the campus society fairs to stay visible and connected.

"Even just last night, we collaborated with Women in Engineering to host a board game night at the Boardroom Café," says Anna. "I think our community has over 60 members, so I'm happy to see things are growing. I even received an email from the Murray Student Centre asking about queer resources, so things have been growing."

The society has big plans ahead, including a bid to host the 2028 EngiQueers Canada Conference (EQCC). If successful, it would mark the first time the conference has ever been held on Canada's East Coast.

Looking Back

As the society has grown, Rowan says it's become clearer what was missing on campus when they first arrived in 2017.

"I used to say there were no queer people on Sexton campus," she says. "I realized I was completely wrong. People were just hiding."

Looking back, Rowan noticed significant gaps in support for queer students, including the lack of gender-neutral washrooms and a limited understanding among professors of how to support trans students. While they say homophobia still exists, progress on campus since that time has been remarkable.

"It's been really nice to see the rainbows popping up, to have our society recognized by the faculty, to be invited to events, to travel, and to receive funding," they say. "There was such a big gap before. There still is one. But we've grown a lot."

Anna agrees. "There is still homophobia on campus and that's exactly why having a community like this is so important," she says. "I've definitely struggled with feeling like I don't look queer enough, but here, I can just be myself. I don't have to mask."

Looking Ahead

This year, Rowan stepped back from their role as co-president, opening the door for Anna to take the lead.

"I feel like we're doing a lot of rebuilding after so many people graduated and moved home," Anna says. "But things are going really well." She hopes to see more participation from both the 2SLGBTQIA+ community and allies. "I know school is busy, but taking breaks to reset is important. I hope we can keep building that sense of belonging for everyone."

Now an active leader within the Faculty of Engineering, Anna also began her master's in Electrical Engineering last September. Originally planning to continue work on perovskite solar cells, she's now diving into robotics research in Dr. Jason Gu's lab. "I came in with almost no robotics experience," she laughs. "But Dr. Gu has been incredibly supportive, and I've been learning so much along the way."

And as Anna's master's degree is just beginning, Rowan's journey as an undergraduate is coming to an end. This spring, she hopes to walk across the stage at convocation with her baby girl by her side. They say balancing motherhood, navigating an ADHD diagnosis, and discovering their identity made their degree challenging, but they're grateful for the support EngiQueers provided. And they hope sharing their struggles can guide and inspire others.

"Last year at the gala, I said in my speech that EngiQueers had saved my life, and I truly meant it," they say. "I was on a fixed path, unsure of who I was, where I belonged, or where I even fit in engineering. EngiQueers gave me friendship, a sense of belonging, and understanding."

"And like Anna said," they continue, "it gave me the confidence to walk into a room and make sure even one or two people felt safe. And that has made all the difference."

Meet the Students Behind the Jumpsuit

How the Dalhousie Engineering Gearheads are making an impact.

At Dalhousie Engineering, you can't miss the Gearheads. Decked out in jumpsuits, hard hats, and safety glasses, they're impossible to ignore, and that's exactly the point. Leading the student group is third-year electrical engineering student Alexandre DesAulniers, whose signature look has become a campus trademark.

"The idea is to be inviting," explains Alex. "It's about being silly, approachable, and showing our excitement for what we do. We want people to feel welcome and engaged in the community."

"And it's not just me," he adds. "Every one of our team members has a jumpsuit too. We're all identifiable, I'm just a little more eccentric with mine."

That playful energy is only one side of the Gearheads. A student-led society, their goal is to bring their peers together, celebrate engineering, and rebuild community spirit on Sexton Campus.

"Our overarching mission is community," says Alex. "We're out flipping grilled cheeses, we're at student events, orientation, and sometimes we're even invading lectures. That's the fun side of what we do. But we're also building connections, encouraging teamwork, and fostering pride and belonging among Dalhousie Engineering students."

And their impact doesn't stop there.

Through their volunteer program, the Gearheads have sent students into the broader HRM community, supporting organizations like Phoenix Youth and local junior high schools while inspiring younger students to explore engineering.

"In the last year alone, we've had over 250 students sign up," says Alex. "It's a win for everyone. Community partners get volunteers, students build leadership and soft skills, and they do it together."

Building a Sense of Belonging

Alex's connection to Dalhousie Engineering didn't begin when he enrolled as a student. It started years earlier.

Long before he was leading a society in a jumpsuit and hard hat, he spent summers on Sexton Campus through youth programs and high school co-op placements, working alongside engineers and becoming familiar with the culture and community.

Those early experiences didn't just introduce him to engineering, they made the campus feel like home.

"I knew from around grade three or four that I wanted to do engineering," he says. "A high school co-op at Dalhousie's facilities management really solidified it, and that's when I knew this was what I wanted to do."

"It's about being silly, approachable, and showing our excitement for what we do. We want people to feel welcome and engaged in the community."

ALEXANDRE DESAULNIERS

Choosing Dalhousie Engineering was the obvious choice, especially given his familiarity with Sexton Campus. But it was the faculty's strong sense of community that really drew him in and later inspired his involvement in student life.

"When I started in first year, there wasn't a lot of spirit or engagement on campus," he recalls. "People were still coming out of COVID. Everyone just wanted to study. That's understandable, but I wanted to help rebuild that sense of community."

Two years later, he says he's seen a lot of change on campus. "First- and second-year students are way more engaged now, not just with Gearheads, but with everything happening on campus," he says. "Seeing that growth has been incredibly rewarding."

Leading the Gearheads

Now as team lead, Alex is working alongside seven executive members to make the Gearheads sustainable well beyond his time at Dal.

"My goal is that I could step away and the organization would still run smoothly," he says. "It's not about me; it's about the community."

His number one goal is strengthening what already exists: expanding volunteer partnerships, running spirit events, and continuing to build connections within Dal Engineering and the broader HRM community.

For Alex, the message is simple.

"Whether through Gearheads or something else, I just think it's so important for students to get involved on campus. Getting out and being part of the community is so important. When you feel like you belong and when you feel engaged, it's much easier to perform, feel proud, and give back. I think meaningful outcomes come from that."

And for Alex and the Gearheads, that involvement has sparked many positive outcomes, both on Sexton Campus and beyond.

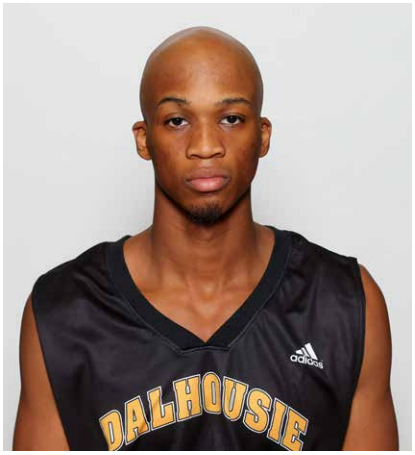
Balancing Books, Basketball, and Engineering on and off the Court

Engineering is a challenge. Varsity basketball is a demanding. Doing both at once means learning very quickly how to manage time, expectations, pressure and life. Just ask Jayden Parker, Osazemhinde Oseghale, Samuel Olugu, Isaiah Graham-Roache and Cedric Sanogo, five current and former Dalhousie varsity basketball players who are proving that the impossible is very possible.

But they're not doing it alone. These engineering students are taking on varsity basketball together, sharing notes, study hacks, and strategies to survive the grind. They lean on each other and on former players who've been through the grind. They also rely on a remarkable coaching staff, including Dal Engineering alum Kevin Bezanson, or Coach Kev as the players call him, who provides the support and flexibility they need to balance academics and athletics.

Together, their support network has carried them through long days, tough classes, and a season that tested their resilience. Now, they're showing us what it really takes to juggle engineering and varsity basketball.

From Athlete to Mentor



CEDRIC SANOGO, from Montreal, earned his Industrial Engineering degree in 2019 while playing for the Dalhousie Tigers men's varsity basketball team. As team captain, he developed leadership skills on and off the court and now mentors younger engineering varsity basketball players.

"When I first joined the team, I was one of the only engineering players around. Balancing my classes with basketball was overwhelming—I had to figure out how to eat, get to practice, and complete my assignments while keeping up with school. Coach is very demanding and vocal, so meeting expectations on both fronts was tough. On top of that, I wasn't confident speaking English at first, and I tended to keep to myself. Learning to talk to my teammates, make friends, and just be more open was a big part of finding my place—not only on the court but in my classes too.

I did my first year in residence, and in my second year, I paired up with one of my engineering buddies in school instead of a teammate, just to help me out with academics rather than basketball. That helped a lot. Going through co-op opportunities also helped me land the job I currently have, showing that I could manage leadership as team captain and demonstrate skills that employers value.

"Seeing the next generation grow, thrive, and support each other reminds me why all those long nights, tough practices, and balancing acts were worth it."

CEDRIC SANOGO

Time management became everything. If you don't control your hours, you'll struggle. I also learned early on not to be afraid to ask questions—there's no such thing as a dumb question. Even if a question feels silly, it might be exactly what someone else needed to ask.

I also faced setbacks—during my third year, I suffered a career seizing shoulder

injury and didn't play most of that season. Coming back my final year and being able to compete again was a huge moment for me.

Having a strong support system made a huge difference for me. Whether it was after a tough game or a failed exam, having people around who understood what I was going through helped me get through it. That's a big reason why I try to give back now and support the younger players.

I mentor the newer players, especially those in engineering, sharing advice and helping them balance academics, practice, and life. I genuinely want to see them succeed as much as I want to succeed, and I've told them that many times. Looking back, I'm proud of what I accomplished and honored to still be part of this team. Seeing the next generation grow, thrive, and support each other reminds me why all those long nights, tough practices, and balancing acts were worth it."

Leading the Way

JAYDEN PARKER, from Milton, Ontario, is a Chemical Engineering student and one of the more senior members of the Dalhousie Tigers men's varsity basketball team. Now a leader on and off the court, he mentors the team's three first-year engineering players, helping them navigate the demands of both academics and athletics.

"When I first came into the program, it was a shock. You don't experience this kind of workload in high school—not academically, and not athletically either. It really felt like being thrown into the deep end, and you have to learn how to swim quickly because you don't have a choice. My first two years were definitely the hardest. There were a lot of sleepless nights—times I'd stay up finishing assignments, then go straight to a 6:00am practice without any sleep.

Time management is the biggest thing. It's a lot to juggle—the demands of engineering and the demands of varsity basketball. You look at other teammates' schedules, and they might have gaps in their day, time to train or rest. Ours are packed. It's usually a full day of classes starting around 8:30am, trying to fit in

meals where you can, and then heading straight to practice. It's not just mentally demanding, it's physical too.

"You look at other teammates' schedules, and they might have gaps in their day, time to train or rest. Ours are packed."

JAYDEN PARKER

What really makes a difference is having people around you. Being in such a tough academic program while also playing a demanding sport can feel overwhelming but having other engineering players on the team changes that. We support each other, share notes, study together, and help fill in the gaps if someone misses something. It's a lot better than trying to do it all on your own.

I've also learned that a lot of the skills go both ways. Things you pick up through your studies can help you on the court, and things from basketball—like discipline, communication, and leadership—carry over into school. As you get older on the team, you take on more responsibility. You have to communicate more, be more of a leader, and that translates directly into how you work with classmates and professors.

I had a setback in my second year—I got a concussion during preseason and was out for about two months. That was one of the most difficult stretches I've been through, balancing recovery with school. But it taught me a lot about resilience. You're faced with a choice in those moments, and giving up is never the option. You just have to keep going.

Now, as one of the more senior players on the team, I try to be that support for the younger guys. I've been through what they're going through, so I make myself available—whether it's helping with school, answering questions, or just talking through challenges. We lean on each other a lot, and that's made a big difference.

Even with how demanding it is, I'd say being part of both engineering and a varsity program is worth it. It's tough, but it pushes you, and in the long run, it benefits you in ways that go far beyond the court or the classroom."

Finding his Place

OSAZEMHINDE OSEGHALE, originally from Nigeria, is a first-year Bachelor of Engineering student and a member of the Dalhousie Tigers men's varsity basketball team.

"I'm from Nigeria. I moved to Canada five years ago—Saskatoon—at the start of Grade 9. It was very scary, just moving and not knowing anyone. I had to leave my friends and most of my family.

Engineering is a good challenge. There's just endless opportunities and rewards for being an engineer. I'm trying to go into civil engineering. That's what I have my mind set on.

"Jayden, Isaiah, Cedric, Sam, Coach Kev—the guys in engineering. They understand what it's all about. That support means everything."

OSAZEMHINDE OSEGHALE

It's a continuous learning process on and off the court. Some classes are tough—you think you're putting in the right work, but you're not getting results. You're working hard, but the wrong way. I've learned there are different ways to study.

Basketball helps. I've been allowed the most freedom to do school work, and that really helps me. If I don't have my school in place, I don't feel comfortable doing anything else. Being able to manage school and basketball is very helpful.

Everyone is from different backgrounds. There's not one story that's the same. You get to learn about different parts of the world, different cultures—everything.

I still talk to my parents the most, but here it's Jayden, Isaiah, Cedric, Sam, Coach Kev—the guys in engineering. They understand what it's all about. That support means everything."

Stronger Together

ISAIAH GRAHAM-ROACHE, from Montreal, is a first-year Bachelor of Engineering student and a member of the Dalhousie Tigers men's varsity basketball team.

"Coming into a pretty challenging program as a first year, having other guys to support me—and to support each other—is really helpful in starting off university.

I'm from Montreal. I went to CEGEP for three years and graduated in mechanical engineering technology. I could have gone to work as an engineering technologist, but I decided to continue my studies to become an engineer. I'm looking to go into mechanical engineering.

Coming from CEGEP with a pretty intense course load, that helped with my time management. Like Jayden said, time management is one of the most important things in your first year. It's been a lot to manage, but you have to prioritize certain things over others. Sometimes if your friends want to go out, you have to choose school.

"...you have to prioritize certain things over others. Sometimes if your friends want to go out, you have to choose school."

ISAIAH GRAHAM-ROACHE

Being on a team with other engineering students has been really helpful. We have Jayden to guide us—he's been through what we're going through, so he tells us what to study and how to approach classes. If we're having problems in a course he's taken, he helps us figure it out.

Me, Sam, and Osaze all picked the same schedule on purpose so we could study together and really help each other out. That's made a big difference."

Finding Balance

SAMUEL OLUGU, born in Worcester, Massachusetts, and raised in Canada, is a first-year Computer Engineering student and member of the Dalhousie Tigers men's varsity basketball team.

"Well, my background is Nigerian—my parents were born there—but I was born in the States, Worcester, Massachusetts, and then my family came to Canada. I basically grew up here.

I feel like when I was smaller, throughout elementary school, I was kind of the tech guy around the house. If the Wi-Fi wasn't working, my family wouldn't know what to do, so I had to handle it. I've always liked numbers, so I knew early on I wanted to be an engineer. When I applied to Dalhousie, they had just started Computer Engineering, which was exactly what I wanted to do.

Time management is a huge challenge. I struggled with it in high school with IB classes, and it's still something I work on in university. I block out time to study with Osaze and Isaiah because we intentionally picked the same schedule to help each other out. We prioritize school over other things, and it helps having teammates who are in the same situation.

"...it's about teamwork and pushing through the challenges."

SAMUEL OLUGU

Some of the best parts are traveling and sharing meals before games, like at Boston Pizza. We sit together, share stories, and get to know each other better.

Missing the playoffs this year was definitely heartbreaking. We watched Memorial play, and we knew we could have made it. Especially since some people didn't even expect us to make it this far with so many first-year players. But there's a lesson learned from it—it's about teamwork and pushing through the challenges."

CARRYING THE LEGACY OF ROD SHOVELLER

When Kevin Bezanson (BEng'89) started his engineering degree, one of the first things he was told was, "you can't play basketball and take engineering at the same time." As it turned out, that advice was wrong.

And that's something he now tells students hoping to play for the Dalhousie Tigers while pursuing an engineering degree. A former Atlantic University Sport (AUS) and varsity basketball player at the Technical University of Nova Scotia (TUNS), now part of Dalhousie University, Kevin is not only an assistant coach for the Dal Tigers but also the team's unofficial engineering mentor.

"When Dal is recruiting someone interested in engineering, Rick Plato (Tigers Head Coach) always tells me to meet with them, show them around campus, and take them to lunch," he says. "I talk about basketball, engineering, what it's like to balance both, what their future plans are, and whether they're really serious to take on this challenge."

He guides students, not just because he's been in their shoes, but because of the mentors who shaped his own basketball journey.

Finding a Mentor

A Chester, Nova Scotia native, Kevin had always loved basketball. But when he started his engineering degree at Saint Mary's University (SMU) in the 1980s, he was told that it was impossible to balance engineering with varsity sports. That, however, didn't keep him off the court.

One afternoon in his first year, he wandered into the SMU gym hoping to borrow a ball from the equipment office. Instead, he was turned away and told to come back later when more players would be on the court.

He later discovered the man who sent him away was Rick Plato, the same person who would one day ask him to join the Dal basketball coaching staff. Unfazed, Kevin returned that afternoon and joined a scrimmage with the group, soon realizing they were SMU's varsity basketball team.

"Rick and I just keep weaving back and forth in our lives," Kevin laughs, adding that he eventually went on to play basketball with the SMU team. A few years later, in his final year at TUNS, he even played against Plato, who had just begun his storied coaching career at Mount Saint Vincent University.

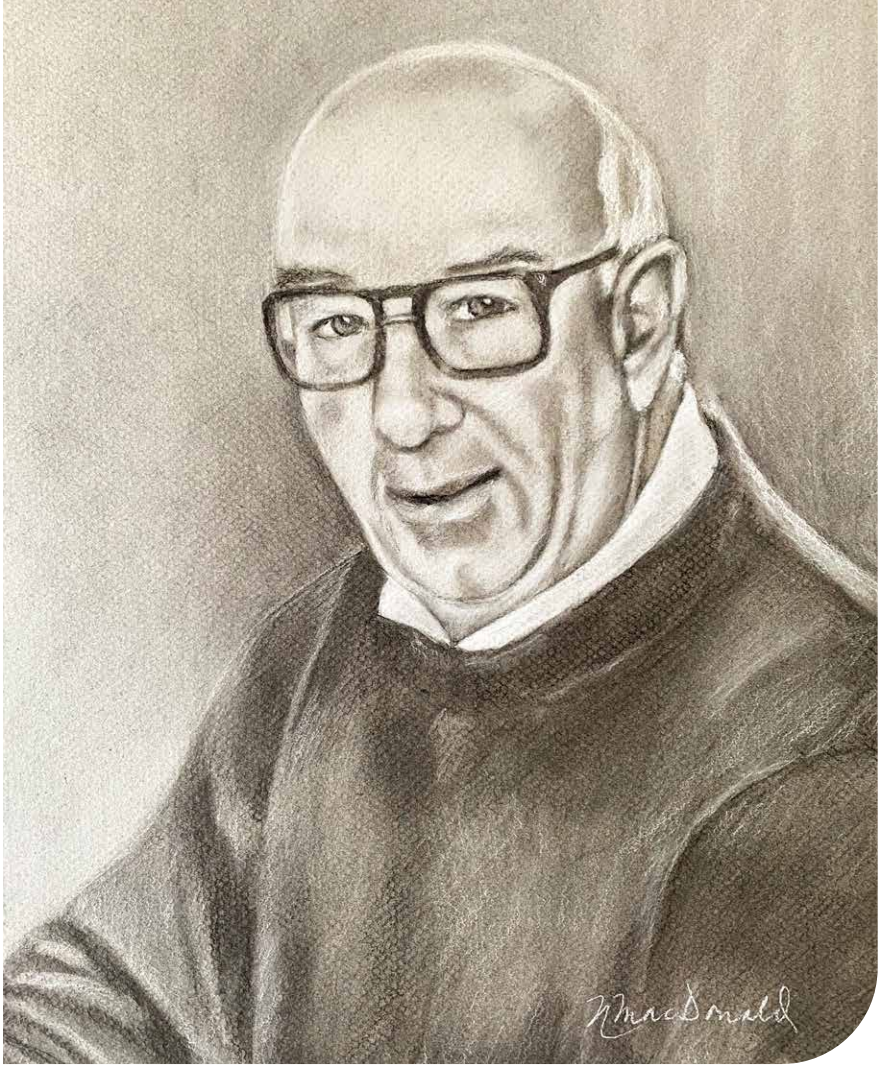
When Kevin finished his Diploma of Engineering and Bachelor of Science at SMU, he enrolled at TUNS to complete his three-year Bachelor of Engineering. There, he tried out for the varsity basketball team and met a man who would greatly impact his life. His name was Rod Shoveller.

"I showed up my first day and asked if he was Rod Shoveller," Kevin recalls. "Rod was huge, 6'3", 250 lbs, bald, intimidating if he wanted to be, and he seemed to be having a bad day. I asked if there was a basketball team, and he brushed me off. I told him I played at SMU and thought I could make the team. Suddenly, he stood up, put his arm around me, and said, 'Let me show you around.' That was the moment that I knew that we connected," Kevin recalls.

Rod became a mentor that Kevin very much admired. Although he had a tough exterior that could frighten anyone, he had a quiet way of easing stress. His office, right under the Sexton Gym, became a place where students could drop in to talk about challenges, share a laugh, get advice, or just catch a moment to themselves before going to the gym to write an exam.

However, the team soon began to notice something unusual in the storage room next door to the office: a few mats and a pillow. They would joke that Rod was sneaking in daytime naps. What none of them realized at the time, not even Rod himself, was that he was already fighting cancer.

After graduation, Kevin stayed in touch with Rod, writing letters to his mentor from



time to time. “When I came back to Halifax two years later, I made some phone calls and found out he was in the hospital. I went to see him and we talked for a long time and I was really happy,” remembers Kevin. “I thought he looked good, and I told him I’d come see him tomorrow. He told me to call first. The next day he passed away. I was just stunned.”

That same year, the Dalhousie coach at the time, Bev Greenlaw, led the charge to name their annual tournament in Rod’s honour: the Rod & Joan Shoveller Memorial Men’s Basketball Tournament, later updated to include his wife’s name after her passing.

Honouring Rod Shoveller

Over time, Kevin stayed close to the game. He coached youth basketball teams in Prospect where he now lives, mentored players, and kept in touch with Rick Plato.

He also built a career as an engineer and later manger and Director at CBCL Limited, launched his own consulting business, and taught engineering courses at Dal part time for over 30 years. Through it all, his support for the Dalhousie men’s basketball team grew, mentoring players, donating proceeds from his private consulting work to support the Dal basketball team, and eventually joining the coaching staff.

Then, in the spring of 2021, he found himself facing the same battle as his former mentor. He was diagnosed with acute promyelocytic leukemia.

“When I was in the hospital, I had a lot of time to think,” he recalls. “Rod was around my age when he got cancer and the thing is when you first get cancer and its not diagnosed yet, you just do not understand why you are so tired and have no energy, and suddenly it hit me. I remembered those blankets and mats in the storage room, and it became clear to me that Rod had no idea at that time that he had cancer and he was just trying to make it through the day. His main goal was to just always be there for the students. That was amazing.”

Kevin also realized then that while the Shoveller tournament carried Rod’s name, many players likely didn’t know who he was, or the kind of person he had been. Even Rod’s grandsons, Mike and Ben Shoveller, who both played on the team, had never met their grandfather. That’s when Kevin decided to do something about it.

Working with the university, he commissioned a drawing of Rod and arranged for it to be presented to the family that year at the tournament to honor his mentor’s impact.

“Rod wasn’t an engineer,” Kevin says, “but he was at the heart of student life, always showing up, always mentoring. I wanted people to see that.” Faculty of Engineering Dean Dr. John Newhook also joined in, representing the engineering community and showcasing just how much Rod had shaped life on campus.

Over the last three years, Kevin has reached out to the engineering community, including past classmates, to raise money to support the Shoveller Tournament. He says his goal is to help players, students, and the Dalhousie community experience the same mentorship and energy that Rod brought to the game.

Passing it On

Today, cancer-free and still coaching basketball, Kevin says he feels honoured to be so closely involved with engineering students and is grateful to share the lessons and strategies that helped him endure life as a varsity athlete.

"Time management is everything,” he says. “I also try to show students that learning from those who have gone before them makes all the difference.” But above all, he adds, is having the right mentors and supporters by your side to celebrate all the wins and losses along the way.

“Really special and unique”: Galaxia Mission Systems co-ops offer space tech experience

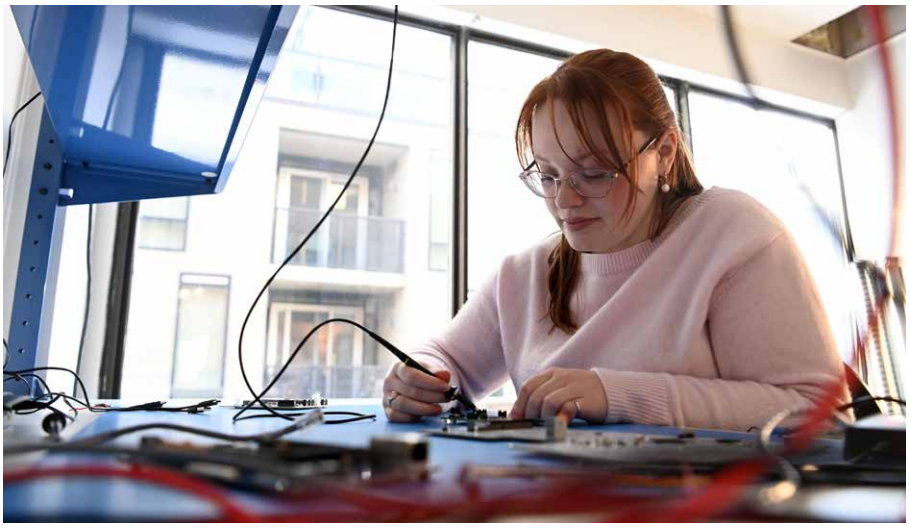
As kids, Kristian Lethbridge-Hall (BEng’23) and Maria MacDonnell (BEng’25) were fascinated with space — and inspired by Canadian astronaut Chris Hadfield. Now, they both work at Galaxia, a Halifax-based company that designs and builds intelligent satellites for space missions.

Kristian grew up with “the whole Chris Hadfield craze” and wanted to be an astronaut. He says that interest eventually dwindled, but doing his Electrical Engineering co-ops at Galaxia, and later being hired by the company “reignited” his passion for space. Today, he is Galaxia’s Vice-President of Engineering, running projects across a number of disciplines.

Meanwhile Maria, an electrical engineer in training at Galaxia, also grew up with a strong interest in space and “at least flirted with the idea of being an astronaut.” At 15, while living in P.E.I., she wrote the winning entry in an essay contest. The prize? Meeting Chris Hadfield. (“We talked about playing guitar in space, and he gave me a guitar pick,” she recalls.)

Galaxia was founded in 2020, by Dalhousie University Mechanical Engineering alumnus Arad Gharagozli, with the goal of designing and building satellites that are “intelligent systems that could process information in space, make decisions, and respond instantly to what they see,” Arad said in a May 2025 interview. “We didn’t just want to send satellites into orbit — we wanted to give them a mind of their own.”

Kristian started at Galaxia as a co-op student in late 2020, just two months after the company had been founded. One of the reasons he returned for his later co-ops was the combination of training and responsibility it offered.



“We really value letting people take control of a project, learn in their own way, and approach problems in their own way.”

KRISTIAN LETHBRIDGE-HALL

“I felt a lot of ownership over what I was doing, and I felt a lot of respect in how I was working. I wanted to keep coming back because I really felt like what I was doing was important to the company, and I was also learning a lot,” he says. “There's not a lot of opportunity for space technology in Nova Scotia, so having the opportunity to work in space tech, do something I'm interested in, and then having that kind of autonomy at 19, 20 years — that's what I really liked.”

Today, Kristian supervises co-op students, and he wants to make sure they get the same opportunities he had to work independently and make real contributions. “The philosophy that we try and carry on is giving co-op students a ton of responsibility from the top. Obviously, there's training and everything that goes along with that, but we really value letting people take control of a project, learn in their own way, and approach problems in their own way,” he says.

That fits with Maria's co-op experience at Galaxia. "I really had an interest in embedded systems, and Arad essentially let me fall into a role that matched my curiosity for embedded systems, and programming, and the electronic side as well," she says. "It was a really special and unique thing, being able to pick what I worked on, but also being given the freedom and the trust to approach it however I liked. It was very freeing, because I felt like there were no restrictions on whatever approach I wanted to take."

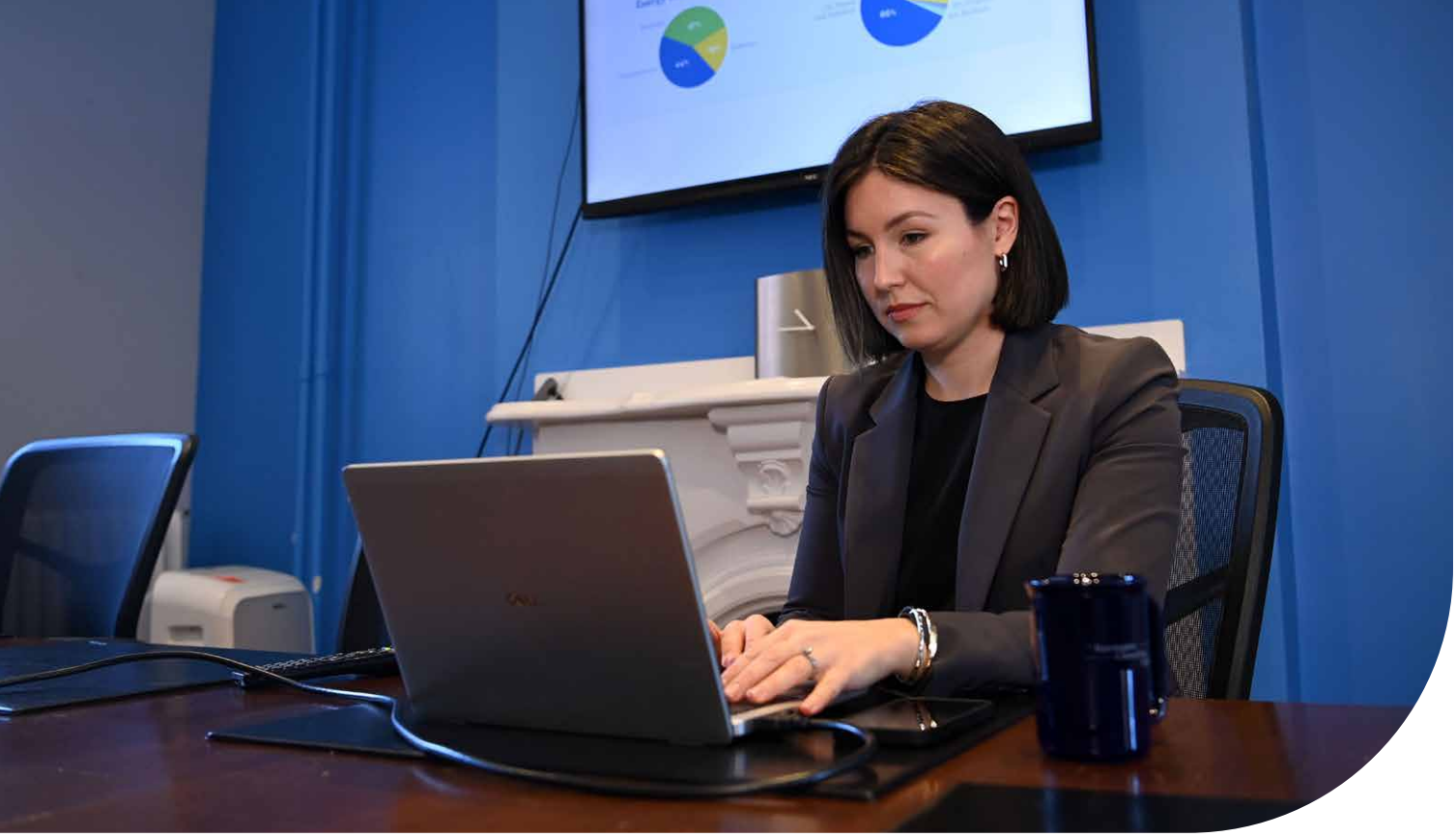
After she graduated in Electrical Engineering from Dal in 2025, she was hired by Galaxia, where she continues to work in embedded systems — a field she describes as "the place where software and hardware meet."

One of the projects she's working on is building a networking layer for Galaxia satellites. It "allows all the different computers to talk to one another over a standardized interface, and then communicate with different computer peripherals," she says.

Kristian adds, "making sure everything can talk to itself internally, and then can also talk to other parts of our satellite, whether it be the camera or the antennas or anything like that — the communication systems."

When Kristian started at Galaxia, he was one of the first employees. Now, the company has grown to nearly two dozen staff, many of them Dalhousie Engineering grads. And it continues to offer co-op opportunities to Dal students.

"We've found a lot of value out of Dalhousie's co-op program specifically," Kristian says. "Three new co-op students from Dal just started at Galaxia, and they are going to be with us for the next eight months. We find a lot of value there."



Tackling the Maritime Energy Puzzle

Danielle Comeau (BEng'14) is the kind of person who runs toward the messiest problem in the room, and it's not just for the thrill. It's because, as she puts it, "it seems solvable."

That mindset has shaped her career as an engineer. Now a partner at Barrington Consulting Group, the Dalhousie Industrial Engineering alum leads the company's energy practice, guiding teams that support utilities, clean energy, and renewable projects. Her work revolves around questions most people may find overwhelming: how energy systems connect, how new technologies fit into existing infrastructure, and how companies can adapt to greener solutions quickly.

"It seemed very complicated at the beginning, and there was a lot to learn," she admits. "I had to step back and look at it from the 10,000-foot level. How does energy work in Nova Scotia? How are the grids connected? Where does hydrogen play a role?"

For Danielle, it's the kind of complexity she was seeking when she started her undergraduate degree.

The Big Picture

Originally from Dartmouth, she came to Dalhousie Engineering with a very clear path.

"I knew exactly what industrial engineering was and I said, that's exactly what I want to do," she explains. What drew her in was the mix of problem-solving and big-picture thinking.

"There's no shortage of problems that need solving. The key is going in with your eyes open," she says.

"There's no shortage of problems that need solving. The key is going in with your eyes open"

After completing co-op terms with Canada Post and Barrington Consulting, Danielle joined the firm full-time and never left. Over the years, her work has spanned healthcare, manufacturing, construction, IT, and utilities, but recently, energy has become her focus. "What I love about it is how complicated it is," she says. "But also how much can be done, and how much needs to be done."

The team at Barrington Consulting do it all, from project management, business analysis, change management, to consulting across a range of industries. In the energy world, that means helping organizations launch new divisions, modernize systems, and navigate major operational and digital changes.

"There's so much to it, and I can see how people spend their entire careers in this field, which is probably where I'll be spending mine," says Danielle. "The subject matter itself is fascinating, but when you add in the systems, technology, people, and processes needed to support it all, the complexity just keeps building."

The work she says, also feels personal. "I have kids. What is their future going to look like?" Contributing toward positive outcomes feels very impactful."

Part of what makes her work meaningful is the chance to see a project through from start to finish. In consulting, teams are often brought in for just one phase, either the beginning, the middle, or a single piece of the puzzle. But in some of her recent energy and utilities projects, Barrington has stayed involved all the way through to delivery.

"We're part of the success and we're part of the end result," she explains. Seeing that impact up close is what drives her. "You see people in their organizations happy and appreciative. You see the impact that you were able to make."

And the field itself is changing fast. From digital tools to artificial intelligence, Danielle says new technologies are quickly reshaping how energy systems are designed, monitored, and managed.

Engineering Creativity

But long before she was mapping systems and processes for utilities and renewable projects, Danielle was building patterns on a dance floor. A dancer as a child, she continued coaching throughout her engineering degree, often working with complex choreography and competitive teams.

"I realized that whether I'm designing a system or building a business, the approach is the same: understand the pieces, see how they connect, and make it all work together."

When she graduated in 2014, she and her longtime coaching partner co-founded Downbeat Dance Company, the only bilingual dance company in the Halifax Regional Municipality. Although dance and engineering might seem worlds apart, Danielle sees a clear connection. That creative work, she says, has quietly shaped how she now approaches engineering.

"When I do choreography, complex hip-hop choreography, I actually used some of those techniques in my problem solving," she explains. "My pattern recognition in choreography... when I'm looking at a company and I look at different systems or processes; I can almost laser-focus on the root cause of the problems."

"It's odd to say, but I do feel like at some point they overlapped," she adds. "Even in my day-to-day, how I look at the big picture and how to solve problems, it absolutely helped."

She credits her engineering degree at Dal with giving her the tools to turn her creativity into a business, and to also thrive at Barrington Consulting

"Engineering taught me how to break big, complex problems into manageable pieces," she says. "I realized that whether I'm designing a system or building a business, the approach is the same: understand the pieces, see how they connect, and make it all work together."

However, she admits there's one challenge her degree hasn't prepared her for: raising children. "Having three kids under the age of four is a humbling experience that I don't think any engineering degree could have set me up for," she says with a laugh.

But as she's proved throughout her career: she doesn't just tackle the mess, she transforms it.

LEADING THE FUTURE OF ARTIFICIAL INTELLIGENCE

Unlike many others, Robert Newcombe isn't afraid of a world shaped by artificial intelligence. In fact, instead of fearing the inevitable, he's helping businesses embrace what's possible.

"It's here to stay. It's not going anywhere," he says. "I think your competitors are using it, your clients are coming to expect it, and even employees want to use it."

As founder of AI First Consulting, the Dalhousie Industrial Engineering alum helps businesses across Atlantic Canada understand and implement generative AI tools. He works with them to develop the training, strategies and policies needed to use AI effectively as new technologies begin to reshape the future of work.

And as interest in AI grows, Robert's business is rapidly growing. But taking the leap to launch his own company wasn't easy.

Early Roots

Raised on a dairy and poultry farm in Port Williams Nova Scotia, Robert grew up surrounded by problem-solving and process improvement. Watching the day-to-day operations of the family farm sparked an early interest in systems thinking, which eventually led him to industrial engineering.

After beginning his studies at Dalhousie's Agricultural Campus in Truro, he transferred to Halifax to complete his degree. There, he found a tight-knit community within the industrial engineering program and discovered how his passion for systems, strategy, and business could come together.

After graduation, he was hired by Barrington Consulting Limited, where he spent the next decade working on process improvement projects and leading Lean Six Sigma training and coaching. Over time, he became involved in marketing, business development, and financial planning, gaining experience running a small business unit within a larger organization.

"I've always been very entrepreneurial, and I always knew that I wanted to start my own business at some point," he says, adding that Barrington Consulting helped him build the skills, network, and experience he would eventually need to launch his own venture. But he debated the move for a long time.

"I wanted to do it sooner, if I'm being honest," he admits. "I just had a hard time pulling the trigger and taking that jump."

The Rise of AI

Things changed with the launch of ChatGPT.

"I realized my learning was slowing down. I had learned a lot from the projects I was running and the people around me, but I felt like I would learn more if I started my own thing and had the space to experiment and test ideas," he explains. "When ChatGPT launched in 2022, that's when I got serious about it. I knew it was

going to be the future of work."

Robert officially launched his business in December 2023. In the early days, he spent evenings and weekends planning his strategy, thinking about how he could differentiate himself and identifying the types of services he wanted to offer.

"When ChatGPT launched in 2022, that's when I got serious about it. I knew it was going to be the future of work."

"It was a lot of research, talking to different people and learning from folks who had started their own businesses," he says.

The company initially launched as Newcombe Consulting, giving him flexibility as he explored different types of consulting work. But as generative AI tools rapidly evolved, his focus shifted.

"Eight months in, I rebranded from Newcombe Consulting to AI First Consulting," he says. "Since that time, we've been 100 per cent focused on generative AI technologies.

Business Growth

In the past year, demand for AI technologies has skyrocketed. At this time last year, Robert was running the business on his own. Today, his company has grown to a team of five.

"I would say last year, there were individuals within organizations starting to play with AI tools. Most of it was either very large enterprise companies or very small companies that were very entrepreneurial. Now this year, everyone's starting to talk about it, and I feel like there are very few businesses that I've talked to that are not curious or trying out ChatGPT or Copilot now," he says.

"Most AI tools work in very similar ways, so once you learn one, it's easier to pick up the rest. We stay on top of new models and specialized tools, but our focus is always on understanding a company's challenges and finding the solutions that fit their operations, not just pushing the newest technology," he explains, adding that for many companies, the biggest barriers to adoption are simply a lack of understanding around security and privacy.

Taking the Leap

Now with so much opportunity in his future, Robert says starting his own business was definitely worth the risk. And for those considering a similar path, he has one key piece of advice:

"I would say you're never going to be 100 per cent ready to do it. You're just going to have to make that jump. There is always going to be risk involved," he says. "How I framed it to myself was: in 10 years, am I going to regret trying this and jumping out on my own? I realized I wouldn't. Worst case, I fail, I learn something, and then I would find another job or another opportunity."

Ten Dalhousie Engineering varsity student-athletes achieved U Sport Academic All-Canadian status during the 2024-2025 year. Their hard work and success were celebrated at the annual Academic All-Canadian Celebration. To qualify as an Academic All-Canadian, student athletes must maintain a GPA of at least 3.50 over the academic year while competing in a varsity sport. Hard work, dedication, sacrifice and support are crucial for success.

Last fall, Civil Engineering Professor Dr. Kyle Tousignant received the 2025 H.A. Krentz Research Award from the Canadian Institute of Steel Construction (CISC). The award is presented annually to the researcher with the highest-ranked proposal in the organization's national research competition.

This marks the third time in seven years Dr. Tousignant has earned the prestigious honour. His leadership has also helped shape the next generation of innovators. In 2023 and 2024, two of his students, Ben Newcomb and Brendan Richards, were awarded the $25,000 G.J. Jackson Fellowship from CISC.

Together, these national recognitions highlight both Dr. Tousignant's contributions to advancing steel research and the strength of the students he mentors at Dalhousie.

Did you know? Dalhousie researcher Dr. Jeremy Brown is working on two groundbreaking medical technologies that could change the lives of people living with brain and spinal conditions. The first is an ultra-high-res endoscope already in human trials for neuro and spine surgery. The second device is a therapeutic ultrasound device that can safely vaporize tissue deep inside the body such as brain tumours. This one is currently in preclinical trials and is showing very promising results.

Dalhousie Engineering hosted the 2026 Atlantic Engineering Competition (AEC) on Sexton Campus, welcoming 180 student delegates from 11 universities across Atlantic Canada. Over three days, participants tackled technical challenges, honed professional skills, and connected with peers and industry partners. Organized by 36 Dal engineering students after nearly a year of planning, the event highlighted the Faculty's commitment to innovation, collaboration, and community, and showcased the very best of engineering in the region.

Three Dalhousie Engineering students were recognized at this year's Dalhousie Impact Awards, which celebrate outstanding achievements across academic life, student life and community service, student societies, and residence life.

Rowan Pratt (left) received the President's EDIA Award for advancing equity, diversity, inclusion, and accessibility through leadership and action.

Eamon Quill (right) earned the Faculty Leadership Impact Award, honoring his exceptional leadership and efforts to strengthen the Engineering community.

Rikuto Nakayasu was named Outstanding Student of Distinction, one of Dalhousie's highest student honours, recognizing sustained, high-impact contributions throughout their university career.

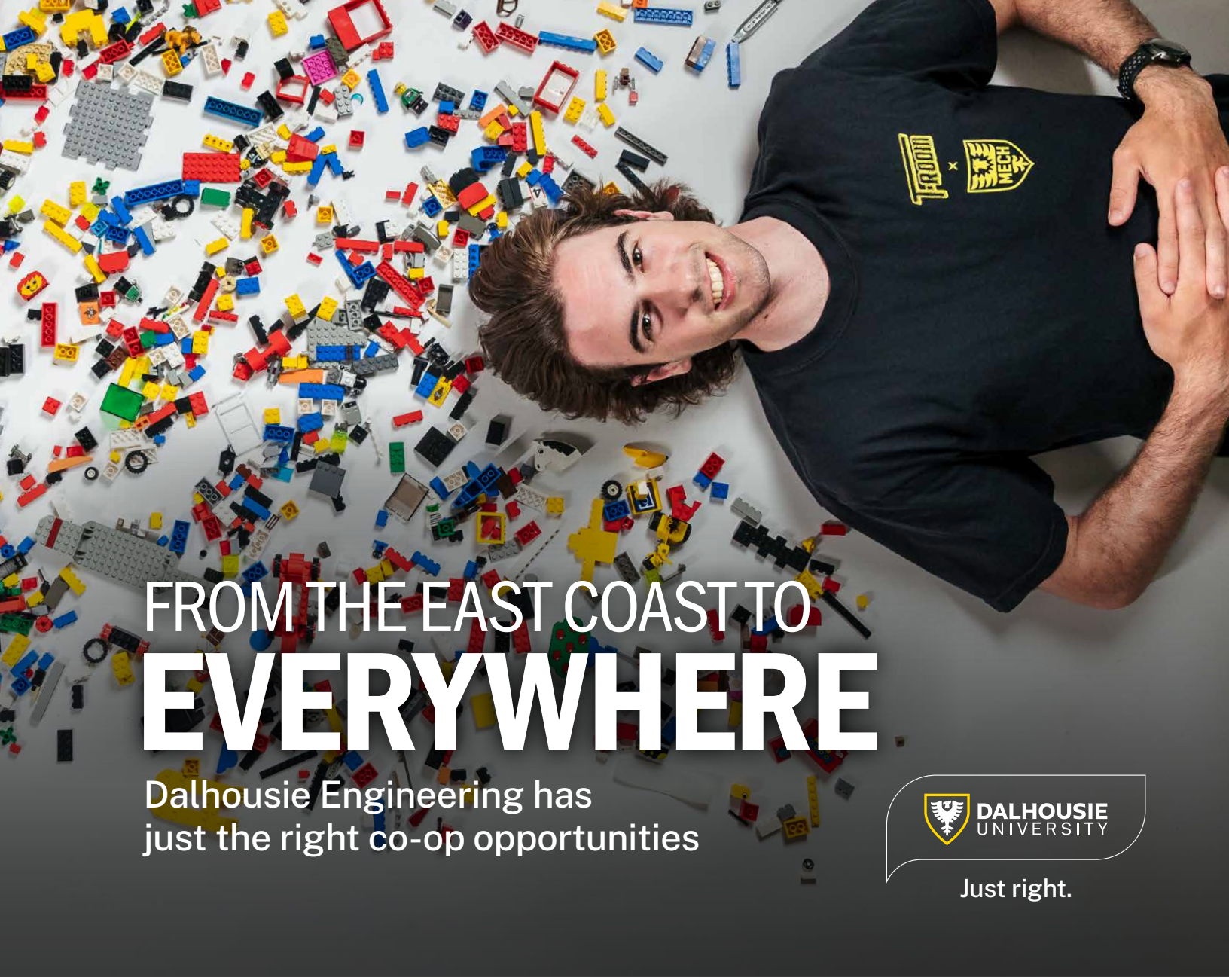
A thank you to our alumni and friends who came out for our 16th Annual Engineering Golf Tournament last September. The event was a fantastic celebration of community and generosity. Each year proceeds from the tournament directly support the Engineering Student Experience Fund, empowering students to take part in extracurricular projects that foster innovation and help them excel beyond the classroom.

On December 6th, members of Dalhousie Engineering remembered the victims of the 1989 Montreal Massacre. A vigil, hosted by the Dalhousie Women in Engineering society, was held on Sexton Campus. The ceremony paid tribute to the 14 women who were shot and killed at l'École Polytechnique in Montreal in 1989. The vigil also celebrated the resilience of women today and a national movement to end gender-based violence.

Dalhousie Engineering celebrated women in STEM for International Women's Day. Students, alumni, and faculty joined an inspiring panel of women shaping careers in science, technology, engineering, and math.

Dal Engineering alum Elisabet Astatkie, now a product analyst at Nova Scotia Power, shared how her Dal experience and involvement with initiatives like Go Eng Girl and Imhotep's Legacy Academy, shaped her career and created some of her most meaningful opportunities outside the classroom.

The event highlighted the progress women in STEM have made and the lasting impact they continue to have on society.



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