FACULTY OF ENGINEERING
CASE FOR SUPPORT

2024

Making a difference starts here

Our campaign for transformational change

The Faculty of Engineering has been a leader in engineering education for more than 115 years. Our focus on educational innovation and immersive learning enables us to prepare the next generation of bold engineering leaders. Our students graduate as collaborative, community-minded, and highly skilled professionals. They help grow our economy, improve systems, and create healthier communities. We have created an environment on Sexton campus that draws innovators and start-ups to test products and build companies. The Emera ideaHUB provides specialized supports and programs to launch world-class technology companies that create new economic opportunities.

Our vision is to be the leading immersive engineering education experience. We will foster a learning environment where diverse critical thinkers, problem solvers, and innovators solve the grand challenges of a constantly changing world. We aim to graduate leaders who drive innovation and growth.
Our goal is to deepen our impact on our local and global communities through high-impact research that provides a path to a better future.

This campaign will enable us to inspire future-ready leaders by strengthening the exceptional student experience we offer.
It will accelerate our research that is helping to mitigate climate change, create sustainable systems, and improve the health and wellness of our communities. It will create a more diverse engineering profession that reflects the communities it serves.

Enhancing our impact

Inspiring Future-Ready Leaders

We are dedicated to building modern engineers — highly qualified professionals who create innovative solutions, drive economic growth, and create a better world. To us, that means offering an immersive engineering education that also gives students the support they need to be successful. When students have this kind of experience, they graduate as skilled, innovative, and civic-minded engineers.

Through this campaign, we will empower our students to graduate as future-ready leaders by:

- Increasing financial support to attract the best and brightest
- Creating more opportunities for students to develop and practice their skills, training, and knowledge
- Enhancing programs, services, and resources that support the academic, mental, and social well-being of our students
- Ensuring all students have the opportunity to turn their passion for engineering into a lifelong career

1. International learning opportunities — $1.4M

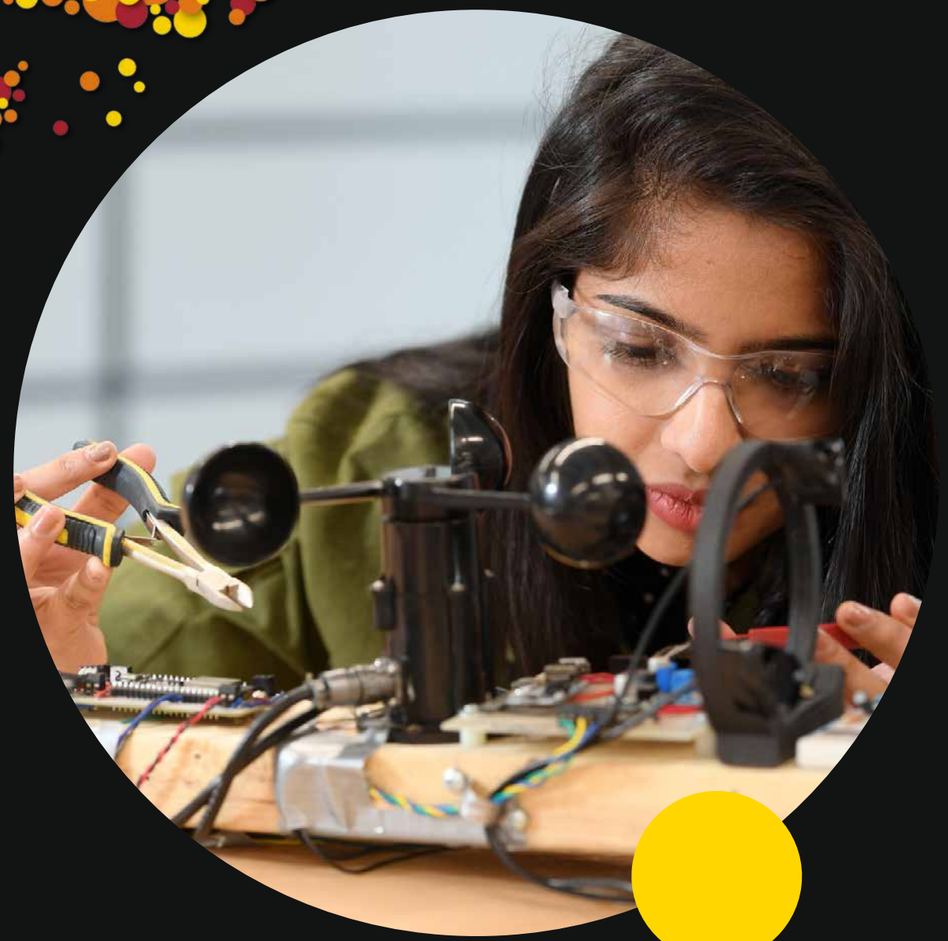
Engineers design and construct new structures, processes, and products that influence how people live globally. It is essential that our engineering students can critically reflect on the impact of their work. We will create more opportunities for students to participate in international learning experiences. This will foster a global mindset and encourage our students to adopt a broader perspective in the ways they contribute to society.

2. Enhanced immersive learning opportunities — $3.5M

Immersive learning is the essence of Dalhousie's engineering education experience. We create opportunities for students to increase knowledge, develop skills, clarify values, and develop their capacity to succeed in their engineering careers. We will enhance and expand our immersive learning opportunities to teach our students to use innovative, practical, and collaborative approaches to solving complex global challenges.

3. Creating more innovation and entrepreneurship opportunities — $11M

Innovation and entrepreneurship are essential to grow our economy and the demand for highly skilled, innovative engineers is increasing every year. We will expand and enhance our programming, facilities, and resources to equip our students with the entrepreneurial and innovative mindset they need to be successful engineering professionals. We will invest in programming to ensure our students have cutting-edge technology, equipment, and programs that bring their products from idea to reality. We will create a mentorship program to provide coaching, leadership, and expertise to new innovators.



4. The Sexton Leaders Program — $900K

Our graduates must be able to work collaboratively, consider alternate perspectives, and think critically to solve society's most pressing issues. We aspire to provide our students with the skills, knowledge, and experience that enable them to become bold engineering leaders. Through the support of the campaign, we will launch the Sexton Leaders Program which will give engineering students the opportunity to develop their professional skills. This two-year program will include extracurricular and certificate opportunities for students to develop their skills in communication, conflict management, leadership, and teamwork.

5. Support for student success — $4M

We envision an expanded financial support program that removes economic barriers, inspires and motivates students, and enables them to follow their passions. We will enhance current and establish new scholarships, bursaries, and awards to attract and retain excellent engineering students. We will focus on multi-year entrance and in-course scholarships. We will also focus on purposeful action to ensure that our financial supports give more consideration to students from all equity-deserving groups.

6. Mental health support — $500K

Our goal is to create an exceptional experience that prioritizes our students' mental health and well-being. Promoting a sense of wellness in the Faculty of Engineering enables our students to achieve their academic, personal, and professional goals. We will enhance our mental health supports to help students gain lifelong skills to manage their well-being.

Where opportunity meets unique experiences

Arsh Singh recalls the feeling of pride when he learned that his team's solar-powered racing car placed fourth in the Formula Sun Grand Prix. "It was amazing to see something we'd worked so hard on finish the competition with such a good result," says Singh.

Singh is a Mechanical Engineering student and member of Dalhousie's solar car design team. He spent a year working alongside other engineering students to design and build a solar-powered car to compete in the international event.

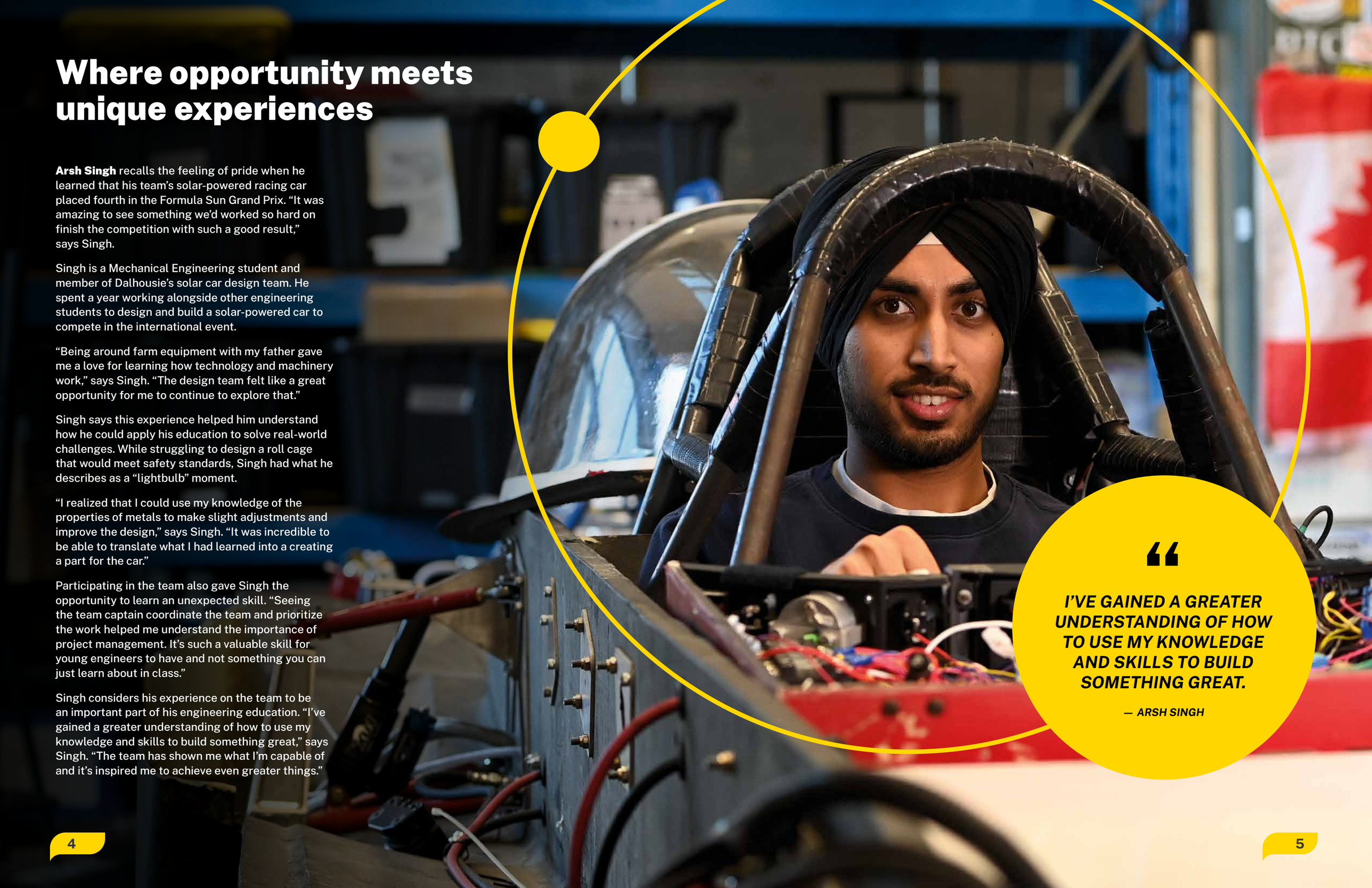
"Being around farm equipment with my father gave me a love for learning how technology and machinery work," says Singh. "The design team felt like a great opportunity for me to continue to explore that."

Singh says this experience helped him understand how he could apply his education to solve real-world challenges. While struggling to design a roll cage that would meet safety standards, Singh had what he describes as a "lightbulb" moment.

"I realized that I could use my knowledge of the properties of metals to make slight adjustments and improve the design," says Singh. "It was incredible to be able to translate what I had learned into a creating a part for the car."

Participating in the team also gave Singh the opportunity to learn an unexpected skill. "Seeing the team captain coordinate the team and prioritize the work helped me understand the importance of project management. It's such a valuable skill for young engineers to have and not something you can just learn about in class."

Singh considers his experience on the team to be an important part of his engineering education. "I've gained a greater understanding of how to use my knowledge and skills to build something great," says Singh. "The team has shown me what I'm capable of and it's inspired me to achieve even greater things."



> ***"I'VE GAINED A GREATER UNDERSTANDING OF HOW TO USE MY KNOWLEDGE AND SKILLS TO BUILD SOMETHING GREAT.***
>
> ***— ARSH SINGH***

7. Expand opportunities for collaborative and interdisciplinary learning — $20M

Our graduates must be able to work collaboratively and integrate the perspectives, expertise, and knowledge of all disciplines to create innovative solutions. We will enhance existing programs and increase our capacity to collaborate with faculties such as Computer Science, Architecture and Planning, Science, and Management. We will upgrade facilities and equipment on Sexton campus to create new and relevant interdisciplinary learning opportunities for students. We will enhance our existing programs in climate change and sustainability, as well as introduce new degree programs including:

- Master of Design and Innovation Management
- Focused professional Master of Engineering in various disciplines
- Bachelor of Computer Engineering
- Certificates in key areas including Biomedical Engineering

8. Inclusive Pathways to Engineering Careers program — $10M

We strive to create an engineering profession that reflects the communities we serve. Our new pathway program seeks to remove barriers and improve access to an engineering education for students from equity-deserving groups. It will focus on creating a safe and successful learning environment including a preparatory year, wraparound supports, mentorship, a welcoming community and targeted financial support for students, teaching and curriculum development, and stakeholder partnerships.

Where experience meets entrepreneurial ambition

Since he was a child **Arad Gharagozli** (BEng'20) has been fascinated with space. Now, a Masters student at Dalhousie, he's launched his own aerospace company GALAXIA, which is dedicated to developing intelligent satellites.

The idea for GALAXIA was born out of Gharagozli's time in the Dalhousie Space Systems Lab — a design lab he started as a second-year student. Gharagozli considers his experiences in the lab an essential part of not only GALAXIA, but his engineering education as well.

"The Space Systems Lab gave me the opportunity to learn how to put the theory into practice and that it's not always a seamless experience," says Gharagozli. "It gave me the space to fail and the tenacity to keep trying, and I think that helped make me a more well-rounded engineer."

Gharagozli and his lab mates partnered with faculty to participate in the Canadian Space Agency's Canadian CubeSat Project. Together, they designed and built the LORIS satellite, which became the first spacecraft built in Atlantic Canada to be launched into orbit.

"As students, we didn't just build a satellite, we also made history in our region and our country," says Gharagozli. "It made me realize that Nova Scotia has the potential to be a hub for the space industry."

In 2020, when he started his Masters, Gharagozli joined the Young Innovators Program through the Emera ideaHub. The mentorship he received through the program helped him successfully pitch his company and secure the initial funding to make GALAXIA a reality.

Since launching, Gharagozli continues to partner with Dal and has hired several engineering graduates at GALAXIA. "Dal has one of the strongest engineering programs in Atlantic Canada," says Gharagozli. "It prepares students like me to solve real-world challenges and contribute to economic growth in our region and beyond."

> ***"DAL HAS ONE OF THE STRONGEST ENGINEERING PROGRAMS IN ATLANTIC CANADA.***
>
> ***— ARAD GHARAGOZLI***

Engaging in High-Impact Research

Our researchers are committed to solving the grand challenges facing society. They take a collaborative approach, working with industry, colleagues across the university, government, and community partners to make a difference. This innovative and interdisciplinary research environment creates solutions that address climate change, improve health outcomes, and sustain the ocean. Our goal is to expand and accelerate our research, creating opportunities for our students and our community to thrive.

1. Advancing sustainable solutions for people and the planet in the face of climate change — $11M

We have notable expertise in key areas that align with the United Nations' Sustainable Development Goals and provincial and federal government priorities. Our research specializations include manufacturing, environmental science and technologies, natural resources and energy, and health information and communications technologies. Our research is conducted through the lens of mitigating and adapting to the impacts of climate change. We are finding sustainable ways to make and use materials, ensure a global supply of safe drinking water, develop tidal energy technology, and create cutting-edge biomedical devices. We will expand our complement of leading researchers, enhance our research facilities and resources, and engage more students in research and innovation.

MORE EFFICIENT TREATMENT PROCESSES MEANS COMMUNITIES HAVE ACCESS TO SAFE DRINKING WATER.

— DR. AMINA STODDART

Where innovation meets sustainablility

Dr. Amina Stoddart (BEng'10, PhD'17) is discovering new ways to improve water quality. Her research at Dalhousie's Centre for Water Resources Studies aims to mitigate the impacts of climate change on drinking water.

"The impact of climate change on water quantity is well-known, but less is understood about how it affects water quality. During our initial research, we noted significant changes to our drinking-water sources because of climate change, such as increases in harmful bacteria. And these changes appear to be accelerating. Our goal is to create sustainable and cost-effective treatment solutions that utility companies can adopt. More efficient treatment processes means communities have access to safe drinking water."

Lifting Our Communities

Our students graduate as professional engineers who are dedicated to serving their communities. An equitable and inclusive profession creates a more well rounded thought of practice. Dalhousie's Faculty of Engineering bears a responsibility to our community to help build a stronger, more inclusive society and innovation economy by promoting equitable access to engineering for all students. To address historic wrongdoings, we are taking decisive steps to build a respectful, equitable, and welcoming place for everyone. We have a particular responsibility to continue strengthening our relationships with our African Canadian and Indigenous communities. Investment through this campaign will expand both our capacity to serve our communities and our outreach activities.

1. Creating more opportunities for youth from equity-deserving groups — $2.5M

We aspire to remove barriers and support youth from equity-deserving groups to develop an interest in science, technology, engineering, and mathematics (STEM). We will build on the success of Dalhousie programs such as Imhotep's Legacy Academy, Math Circles, and SuperNOVA camps to create more opportunities for elementary and middle school students to explore STEM fields. We will amplify the work of our partners to provide students with opportunities to explore STEM concepts, engage in hands-on learning, and build awareness about engineering as a career.

Help make lasting, positive change possible

Bringing Worlds Together will enhance the Faculty of Engineering's ability to prepare the next generation of professional engineers who build companies, develop innovative solutions, and drive economic growth. Together, we will strengthen our research to addresses society's problems through creativity and entrepreneurial discovery. We will expand our outreach to engage more community partners and help young students explore the field of engineering. We will chart a course to create bold engineering leaders with the ability to tackle big projects, grow the innovation economy, and build a better future for all.

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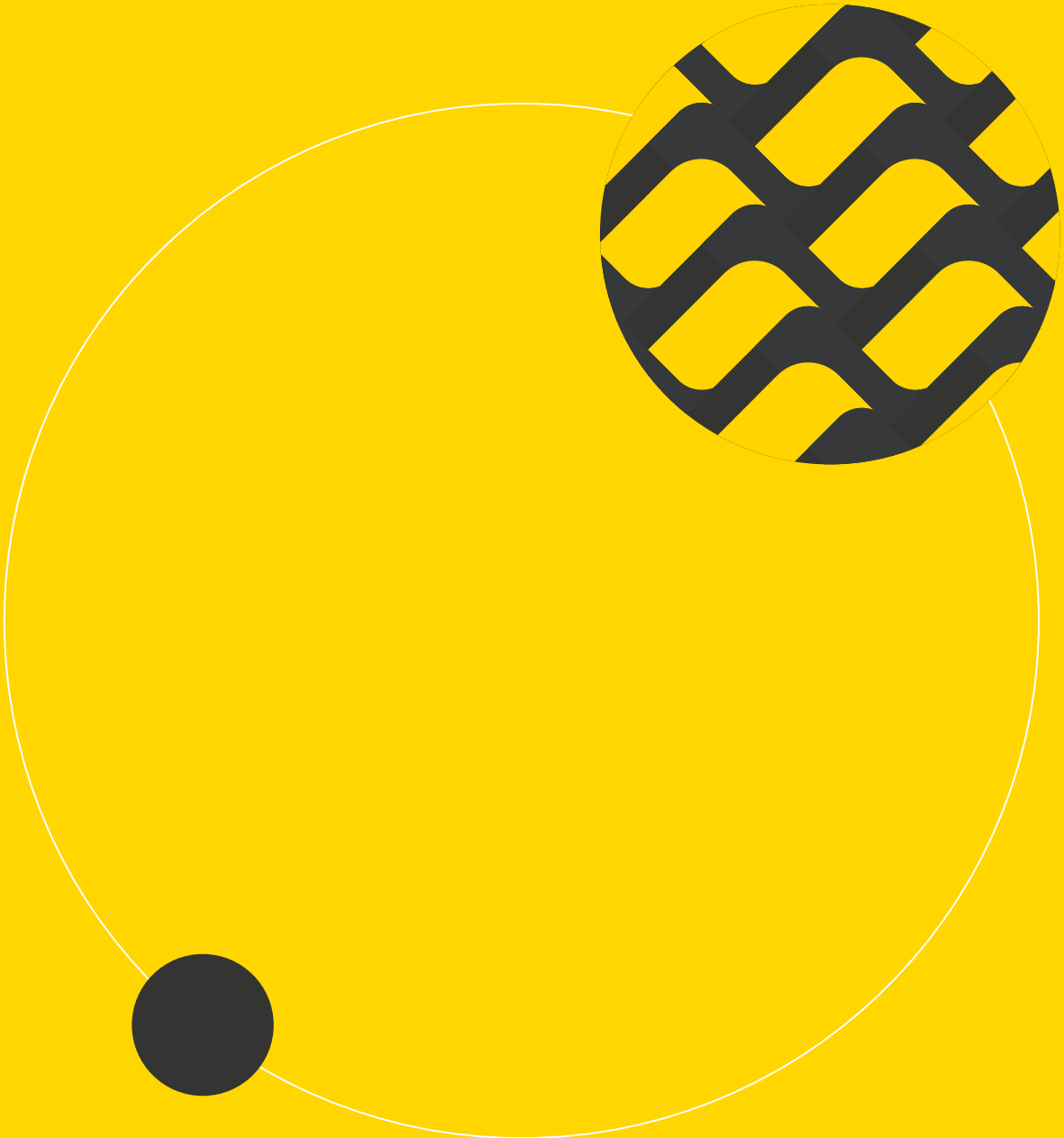

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