

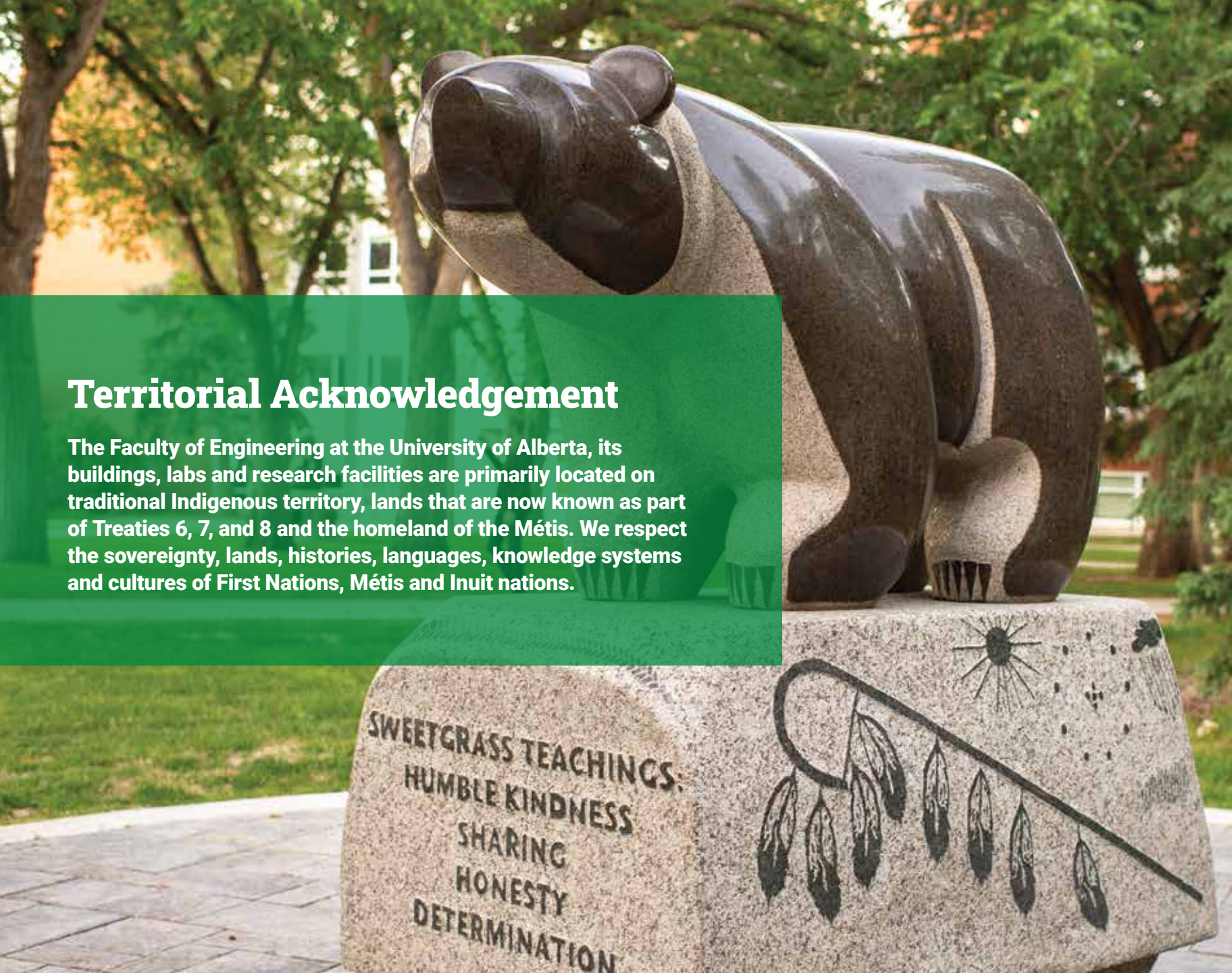


Faculty of Engineering

IMPACT REPORT 2023-2024



UNIVERSITY
OF ALBERTA



Territorial Acknowledgement

The Faculty of Engineering at the University of Alberta, its buildings, labs and research facilities are primarily located on traditional Indigenous territory, lands that are now known as part of Treaties 6, 7, and 8 and the homeland of the Métis. We respect the sovereignty, lands, histories, languages, knowledge systems and cultures of First Nations, Métis and Inuit nations.

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Faculty of Engineering

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Message from the Dean

Engineering makes anything possible, and our faculty is the place where possibility is realized.

Our collective journey has been nothing short of remarkable. Through unparalleled dedication to excellence we continue to push the boundaries of what we know. I am deeply grateful for the ongoing support of our community and truly honoured to lead our faculty into its next chapter.

Since 1908, this faculty has sought solutions for the world's most pressing challenges in energy, the environment, infrastructure and technology. Today, we continue to positively transform our community and the world.

Every person in this community – faculty, staff and students – has been valuable in helping the University of Alberta's Faculty of Engineering rank fifth among engineering faculties across Canada, according to the 2023 Times Higher Education's World University Rankings.

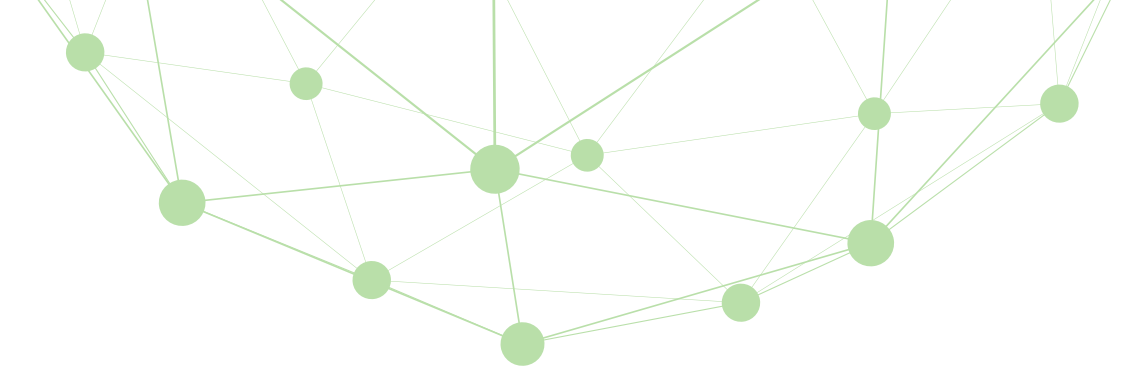
We are developing new relationships with our counterparts across the university as part of the College of Natural and Applied Sciences, and we are finding exciting new opportunities for collaboration and interdisciplinary work with the help of the teams in our college research and education offices. At the same time, within the Faculty of Engineering, we are steadfast in our commitment to our vision and goals. Our mission is to be the most daring engineering community on the planet. Looking to the future, we are embracing a no-limit philosophy: we believe that anything is possible and we want to expand engineering beyond just academics.

To accomplish this, we are building our capacity in research and innovation, empowering a positive culture, increasing our capacity to train students in top facilities and technologies, and ensuring we operate in an effective and responsible manner.

As we embark on this journey together, let us remain steadfast in our commitment to excellence, guided by a sense of purpose and a shared vision for a better tomorrow. Let us harness our collective talents, expertise and passion to surmount every challenge and seize every opportunity that lies before us.

With profound gratitude and utmost respect,

Simaan AbouRizk PhD, PEng, FRSC



VISION, MISSION, VALUES



WE ARE: Driven. Trailblazing. Curious. Supportive. Grounded. Considerate.

OUR VISION

Be the most daring engineering community on the planet.

OUR MISSION

Be united in our unwavering dedication to solving the world's greatest challenges and building a better future for our society.

OUR CORE VALUES

Building our future through people: We support world-class research in a collaborative, cross-functional environment. We aim to diversify the engineering field and apply ingenuity, opening our process and potential for students, faculty and staff.

Developing minds and hands with heart: We take a holistic approach to provide an exceptional student experience, developing graduates who possess technical acumen and emotional intelligence.

Demonstrating the ever-expanding value of our contributions: We promote an understanding and deep appreciation for the value we provide to society through our engagement in the community, research impact and the example of our contributions.

Solving the world's greatest challenges: We position our engineers to uplift the whole of humanity toward a better future by focusing on research programs and exemplary educational and extracurricular experiences.



BY THE NUMBERS

9

Programs accredited by the Canadian Engineering Accreditation Board Co-operative Education and Work-Integrated Learning (CEWIL) Canada

5

Our place among engineering programs in Canada

9

Engineering disciplines taught at the U of A

7

Our institutes and centres
For more information, see page 31.

We aspire to become the top-ranked engineering program in Canada.

FAST FACTS

#1

The Faculty of Engineering ranks first nationally in total energy research publications (2,569)



12,000

The number of square metres of research space dedicated to energy, from oil and gas to carbon capture and hydrogen

RESEARCH IMPACT

What Research Does



The Faculty of Engineering leads large-scale collaborative research, fostering interdisciplinary teams to tackle grand challenges.

The Centre for Energy and Mineral Processing promotes sustainable energy and mineral development. The Institute for Oilsands Innovation supports future oilsands production, emphasizing efficiency and sustainability. nanoFAB is a national open-access training, service and collaboration centre, focusing on academic and industrial applications in micro- and nanoscale fabrication and characterization. The Construction Innovation Centre provides breakthrough research, education and training that directly benefit Canada's construction industry.



\$6.6M

in financial support awarded annually



\$70M

per year in research revenue



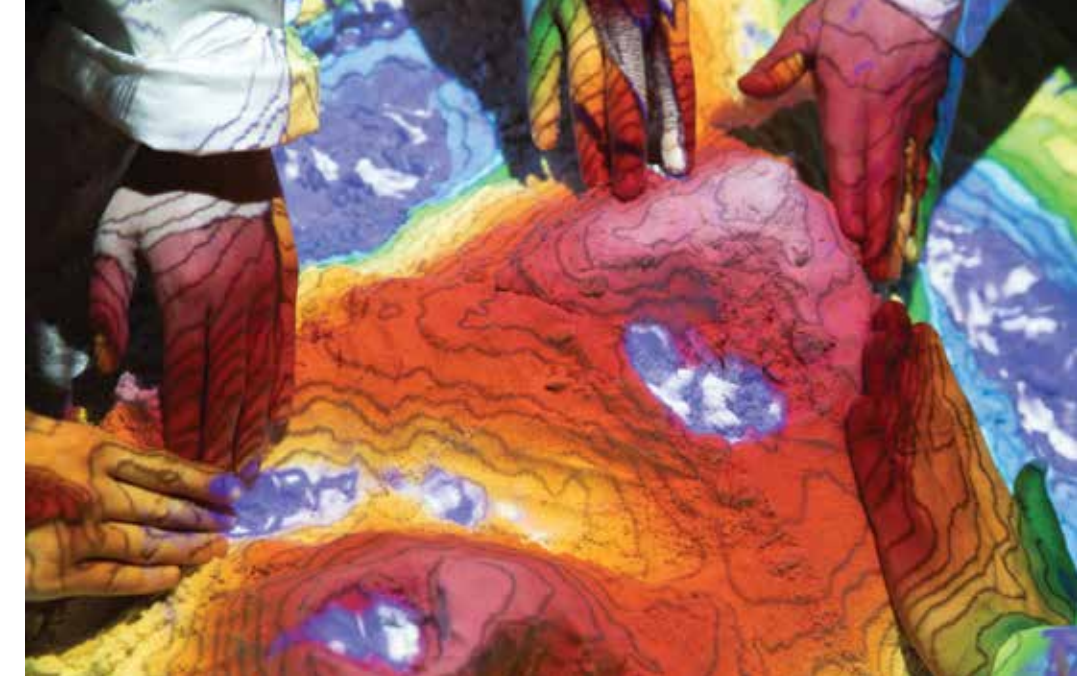
U of A ranks

3rd

in the total number of research publications across Canada

#1

The Faculty of Engineering received the highest dollar value of NSERC Alliance Grants among all Canadian universities for the most recent reporting period (2019-2022). The total value was \$58.8M, about \$6.5 million higher than the second-place institution.



RESEARCH IMPACT BY THE NUMBERS

The Faculty of Engineering is home to:

- ◆ 22 NSERC Industrial Research Chairs (current and past holders)
- ◆ 12 Endowed chairs and professorships
- ◆ 2 Foundation-supported chairs
- ◆ 18 Canada Research Chairs
- ◆ 21 University of Alberta Engineering Research Chairs



Engineering projects explore ways to turn a component of bitumen into carbon fibre for commercial use.

Researchers Cagri Ayranci, Kevin Hodder and Zhi Li are working to transform asphaltenes, a plentiful oilsands byproduct, into an inexpensive feedstock for carbon fibre production. Their projects were born of the Alberta Innovates Carbon Fibre Grand Challenge, a competition to commercialize bitumen-derived carbon fibre.

Carbon fibre, known for its strength, lightness and corrosion resistance, is ideal for various products

but expensive to produce. The researchers aim to reduce costs and environmental impact by using asphaltenes instead of traditional feedstocks from agriculture and forestry.

Ayranci, a professor in mechanical engineering, applies his expertise in multifunctional fibrous polymeric composite materials to the challenge. His team is working on large-scale production of unconventional micro meter diameter carbon fibres.

Hodder, an industrial professor in chemical and materials engineering, likens his process to a hot glue gun. His team uses electrolysis and thermal energy to transform asphaltenes into fibre, with potential applications in products like wind turbine blades.

Li, an associate professor in chemical and materials engineering, focuses on creating ultrathin carbon fibre by aligning asphaltene molecules using an electrical field. His goal is to develop a unique reinforcement material that fills the gap between carbon nanotubes and traditional carbon fibre.

All three projects have shown success in lab settings and are working towards commercial scalability. This research not only aims to create new low-carbon opportunities in Alberta but also to address the challenge of finding valuable uses for the abundant asphaltenes derived from bitumen in the oilsands.

Subterranean Power Play

A geotechnical team led by Rick Chalaturnyk has teamed up with Alberta's first conventional geothermal power project to explore using carbon dioxide instead of water to pump heat from below the Earth's surface. The partnership with Alberta No. 1 Geothermal Energy aims to optimize the plant's contribution to the province's energy solutions.

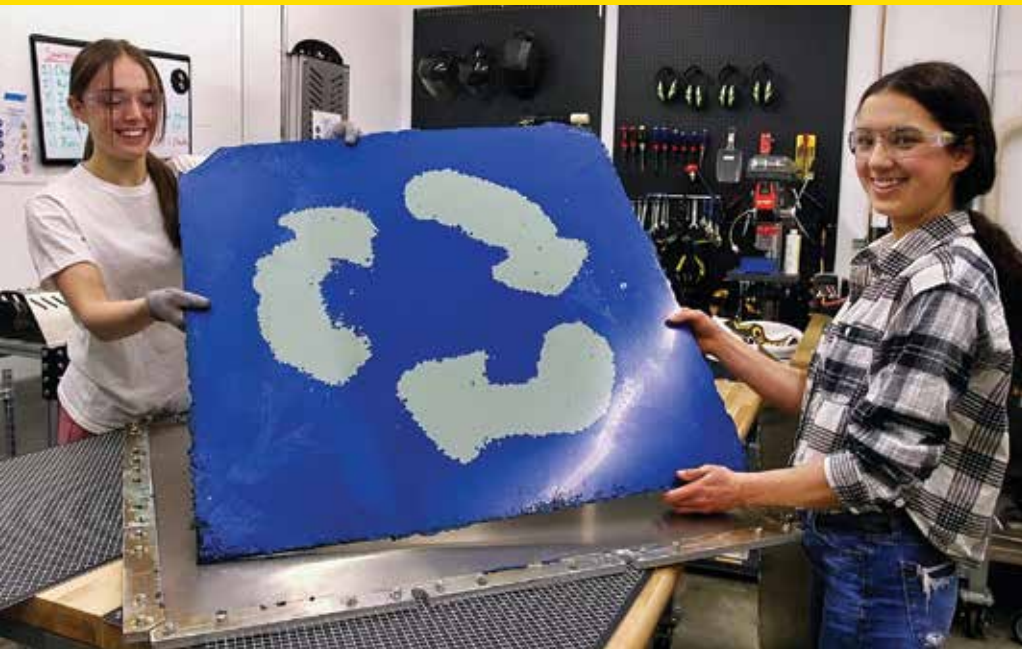
Geothermal resources are reservoirs of hot water below the Earth's surface that can be extracted as a source of renewable heat and power.

"Alberta No. 1 wants to drill very deep, to a package of rocks that sits right above the Precambrian shield, to extract that water," Chalaturnyk says. Meanwhile, his team has been looking at injecting CO₂ into these aquifers for permanent storage.

Together the concept is known as CO₂ plume geothermal, where the injected CO₂ absorbs heat from the reservoir, buoyantly rises to the surface and drives a power generation system. The CO₂ is then cooled and reinjected underground.

New Uses for Oilsands Leftovers

Students Solve Problems



Level 7 members, Micaela Barreda and Autumn Borsellino showcase fabricated recycled plastics.

An in-house facility keeps hard-to-sort items out of landfills.

Two engineering students at the University of Alberta have initiated an on-campus recycling facility, tackling the challenge of handling hard-to-sort plastics, thus reducing landfill waste. Jacob Damant and Connor Povoledo, co-founders of Level 7 Plastics, aim to showcase how educational and medical institutions can independently recycle plastic waste into useful products like bricks and climbing gear.

557
The number of square metres available in the Elko Engineering Garage, a makerspace for students located in ETLC

“We ask ‘why is this important and what problem are we solving?’ If we can’t answer, we don’t want to be the ones doing it. There are a lot of companies out there making money, but they’re not necessarily solving a problem. So why bother?”

Jacob Damant
Level 7 Plastics co-founder

Their venture targets the problematic “other” resin code plastics often overlooked by conventional recycling methods. By processing small, lightweight polycarbonate containers and syringes, Level 7 Plastics produces durable materials such as high-density polyethylene.

Since its inception, the company has recycled more than 450 kilograms of plastic, fostering sustainability within the university community. Supported by the Faculty of

Engineering, Damant and Povoledo have expanded their operations, engaging 20 students and developing various recycled products. Their entrepreneurial journey reflects a commitment to solving real-world problems through tangible action, exemplifying the ethos of addressing meaningful challenges with innovative solutions.



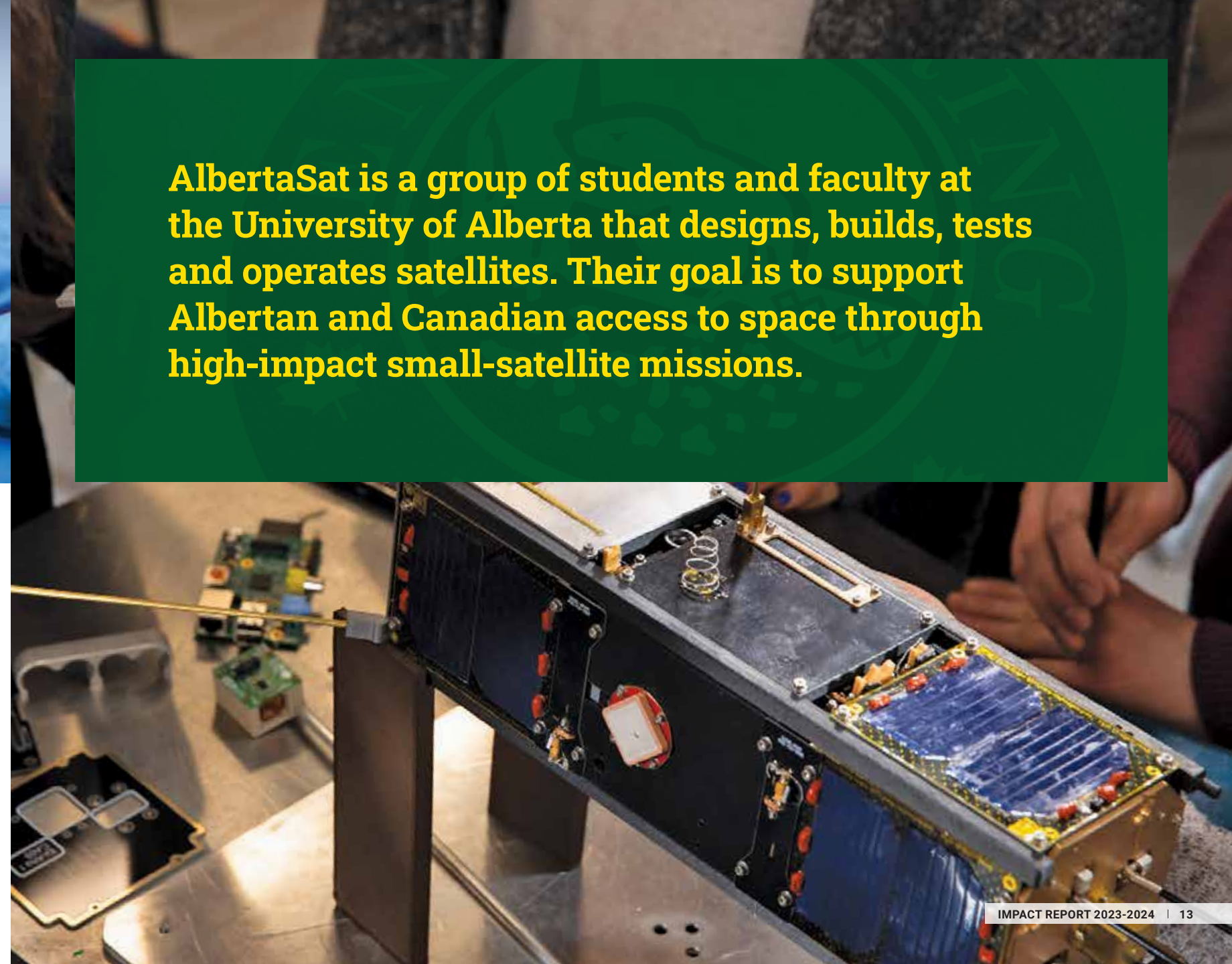
Engineering a Cancer Treatment

Innovative approach uses RNA technology to target gene defects in blood cells.

“Tell me the genetic defect and I’ll tell you the mRNA. I can devise a method to destroy that mRNA, neutralizing harmful effects causing cancer,” says Hasan Uludag of the Department of Chemical & Materials Engineering. He’s developing a drug to combat blood cancers using RNA technology. The approach targets specific gene defects in blood cells underlying acute myeloid leukemia and related cancers. Unlike with conventional drugs, Uludag’s method uses short interfering RNAi (siRNA) to disable defective mRNA, preventing cancerous

protein production. The innovation lies in nanoparticles or lipopolymers that deliver the interfering nucleic acids into blood cells. After 12 years, the research is approaching clinical trials within two years and potential commercialization within five. This breakthrough represents advancements in cancer treatment in a \$33 billion global market. Uludag’s affiliations with the Cancer Research Institute of Northern Alberta and the Women and Children’s Health Research Institute underscore collaboration in innovation.

AlbertaSat is a group of students and faculty at the University of Alberta that designs, builds, tests and operates satellites. Their goal is to support Albertan and Canadian access to space through high-impact small-satellite missions.





Boundary-Blurring Research Revs Up Engineering

The Faculty of Engineering’s participation as part of the College of Natural and Applied Sciences aids our research, focusing on the integration of multiple subfields in engineering, across disciplines and faculties. Our work within our college and with the College of Health Sciences allows us to expand and streamline our biomedical engineering teaching and research programs.

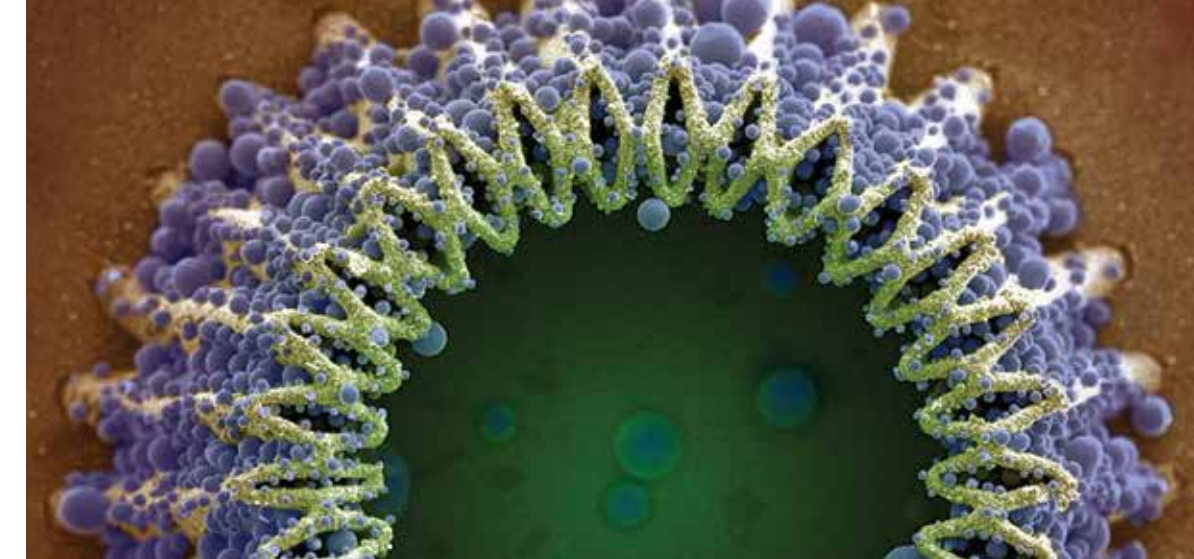
We embrace the interdisciplinary approach.



Tiny Robots, Big Goals

Made of carbon, these devices could be used in cancer treatment, water purification and infrastructure maintenance.

Mahdi Hamidi, a professor in the Department of Mechanical Engineering, is pioneering research on next-generation microrobots so small they defy visibility. Drawing inspiration from the 1966 sci-fi film *Fantastic Voyage*, where a crew uses a new technology to shrink themselves and their submarine and venture inside a scientist’s body to eradicate a blood clot, Hamidi envisions a future where microscopic robots navigate human bodies, targeting tumours and self-destructing post-mission.



In his recent study published in the journal *Advanced Materials*, Hamidi demonstrated that these devices, which he calls micro-actuators, can be made from carbon nanotubes, each 10,000 times finer than a human hair and activated by electric charges. They hold promise for medical breakthroughs, from tumour encapsulation to non-invasive procedures such as colonoscopies.

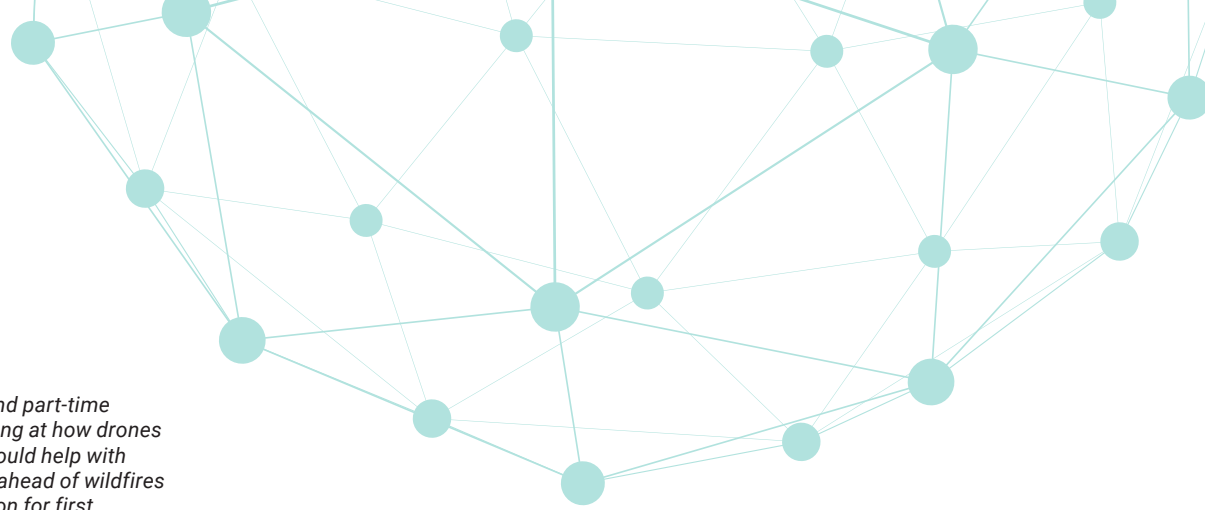
Hamidi’s vision extends beyond medicine; his microrobots might purify water, detect pollutants or inspect the interiors of pipelines. He explores adding nano-scale chips and miniature batteries to enhance their functionality and he envisions a future where microrobots can adapt mid-mission, possibly even connecting to the internet.

The scale of the devices is small, but Hamidi’s aspirations are large. He sees his work as just the beginning, acknowledging the necessity of collaboration and the inevitability of progress. His quest isn’t merely about creating tiny robots but about reshaping the future of technology and health care.

“If I don’t do it, there are very smart people out there who will,” he says. Hamidi’s work is the fusion of imagination and innovation, where the tiniest creations harbour the potential for monumental change.



U of A engineering professor and part-time firefighter Jeff Boisvert is looking at how drones and AI-powered applications could help with everything from getting a step ahead of wildfires to providing valuable information for first responders to emergencies. (Photo: Supplied)



Spot Potential Wildfire Risk with Drones

Can AI help predict wildfire behaviour?

In 2021, a wildfire near Tomahawk, Alta., burned for two months, scorching an area the size of 5,500 football fields and destroying a dozen structures. University of Alberta engineering professor Jeff Boisvert, also a paid-on-call firefighter, faced this massive fire, noting the difficulty in controlling it due to intense crown fires and unpredictable behaviour.

Boisvert, who uses artificial intelligence to optimize mining operations, sought to apply his expertise to wildfire management, focusing on predicting fire growth by studying fuel sources like trees, grass and shrubs. His goal is to

use drones to map the wildland-urban interface, aiding in better operational decisions, evacuation plans and fuel mitigation.

His research aims to provide incident commanders with valuable real-time data, enhancing situational awareness for emergency personnel. Boisvert’s team is developing human-centred AI systems for smoke and hotspot detection, weapon detection for law enforcement, and diagnosing life-threatening injuries for EMS. They envision creating three-dimensional models of emergencies to aid responders.

Boisvert emphasizes the potential of drones in emergency response but acknowledges budget constraints and regulatory hurdles. He collaborates with organizations like the Olds Fire Department to demonstrate the benefits of drone first responders (DFR). Fire Chief Justin Andrew highlights the limitless opportunities AI and DFR technology present, such as early warning and effective response.

“Hopefully we can put numbers to the value that drones are providing to 911 response,” Boisvert says, “and use that work to encourage governments and emergency services to use modern drone programs.”

Tier 1 Sustainability

In the field of sustainability research, three leading scholars from the Faculty of Engineering have been awarded Tier 1 Canada Research Chairs. These esteemed positions account for a quarter of the University of Alberta’s Tier 1 Chair recipients in this specialization. Each scholar will receive \$200,000 annually for seven years to carry out problem-solving research aimed at advancing sustainability across their fields: energy, construction and water.

The Future of Energy:

Amit Kumar’s research assesses the cost, environmental impact and resource availability of energy systems to inform

efforts to reduce greenhouse gas emissions. His team has contributed to Alberta’s Hydrogen Roadmap and advised industry and governments on integrating renewables and improving efficiency.

The Future of Construction:

Vicente Gonzalez is focused on promoting the global adoption of digital lean construction concepts within the architecture, engineering and construction sectors through research at the Intersection of lean construction and digital twins. His work on digital lean construction seeks to help industry seamlessly integrate lean production-based practices, people and culture, as

well as smart digital technologies and automation—all within a human-centred design framework.

The Future of Water:

Mohamed Gamal El-Din’s program focuses on developing effective, low-energy treatment strategies to enable sustainable “circular water systems” that clean and reuse industrial and municipal wastewater. His interdisciplinary team takes a holistic approach combining engineering, environment, science and social aspects.



TEACHING AND LEARNING

The Faculty of Engineering is dedicated to fostering student success and creating positive change in society.

We prioritize diversity and collaboration in research and aim to develop technically skilled and emotionally intelligent graduates who are prepared to take on the world's most pressing challenges. The David and Joan Lynch School of Engineering Safety and Risk Management (ESRM) offers the only integrated ESRM program of its kind in Canada, providing strategies for the continuous reduction of risk exposure for people, the environment, facilities, assets and business interests across industry.

SIGNIFICANT NUMBERS

4,900

Our undergraduate students

1,800

Our graduate students

220

Our amazing faculty members

500

The staff who make it happen

5

Our departments

Students Delaney MacIntosh, Mikael Schmidtke and Immanuel Kasapu study in the engineering student success centre.

Co-op Works for Students and Employers

Since 1981, the Faculty of Engineering's Co-op Program has been a national leader in cultivating young talent and preparing students for an ever-changing global economy.

Our students learn from industry leaders and make meaningful contributions to their communities. Co-op students have access to a team of employment professionals and employers seamlessly integrate future engineers into their teams.

CO-OP BY THE NUMBERS

- ◆ 534 students participated in winter term 2024
- ◆ 551 students participated in fall term 2023
- ◆ 1,043 students participated in summer term 2023

"I worked for 12 months with the electronics team at Red Bull Advanced Technologies, the high performance engineering arm of Oracle Red Bull Racing. I was responsible for an entire part of an electrical system on the RB17 Hypercar Project and I was also tasked with building some calculators and simulation tools. My work has contributed to shaving several kilograms off the weight of the vehicle, saving us a few tenths of a second per lap!"

Sarthak Sheth
Fifth year, Electrical Engineering Co-op

Engineering co-op students have a 95% placement rate.



Sarthak Sheth (Photo: Supplied)

CONGRATULATIONS TO OUR AWARD RECIPIENTS!

Hongbo Zeng and Tongwen Chen, Fellows of the Royal Society of Canada, Royal Society of Canada

Juliana Leung, 2024-2026 Ewha Global Fellow, Ewha Womans University, South Korea

Douglas Ivey and John Doucette, Fellow of Engineers Canada, Engineers Canada

John Doucette, Fellow (Honorary) of Geoscientists Canada, Geoscientists Canada

Venkata Dinavahi and Yasser Mohamed, Fellow of the Asia-Pacific Artificial Intelligence Association, Asia-Pacific Artificial Intelligence Association

Janet Elliott, Ryan Li, Zengtao Chen, Tayfun Babadagli and Douglas Ivey, Fellows of the Canadian Academy of Engineering, Canadian Academic of Engineering

Andre McDonald and Hossein Rouhani, Fellows of the Canadian Society for Mechanical Engineering, Canadian Society for Mechanical Engineering

Joao Soares, Fellow of the Engineering Institute of Canada, Engineering Institute of Canada

Hai Jiang, Fellow of the Institute of Electrical and Electronics Engineers, Institute of Electrical and Electronics Engineers

Patricio Mendez, Fellow of the International Institute of Welding, International Institute of Welding

Jun Jin and Xingyu Li, Amii Fellows, Alberta Machine Intelligence Institute

Tian Tang, University Cup, University of Alberta

Hasan Uludag and Biao Huang, University of Alberta Distinguished Professors, University of Alberta

Thian Gan, ASTech Award, ASTech Awards

Aminah Robinson Fayek, Outstanding Woman In Innovation – Research, ASTech Awards

Our students and researchers benefit from the scholarship of their peers. As a result, we can boast a mighty braintrust. Here are some of the awards our faculty, staff and students have won recently.

Simaan AbouRizk, Outstanding Innovation in Construction, ASTech Awards

Hassan Dehghanpour, Award for Hydrogen Innovation, ASTech Awards

Wenming Zhang, ASTech Award for Sustainability Solutions – Research, ASTech Awards

Rafiq Ahmad, ASTech Award for Digital Innovation, ASTech Awards

Ying Tsui, Tarek El-Bialy, Jie Chen and Cristian Scurtescu, ASTech Researcher of the Year, ASTech Awards

Zengtao Chen, Frank Spragins Technical Summit Award, APEGA





COMMUNITY IMPACT

We value open doors over ivory towers.

We strive for an environment that fosters collaboration, transparency, diversity and accessibility by design. We strive to make our community better, with a service-minded approach to the work we do. We are accountable to the land, water and communities where we live and practise. And we practise all over the world.

Where Our Alumni Live

Edmonton: 17,699	USA: 1,173
Calgary: 6,877	Asia: 419
Rest of Alberta: 1,595	International: 74
Canada: 4,471	Total alumni: 36,846*

**Some records provide no geographical information.*



Métis Student's Breakthrough Tech Protects Communities from Toxic Algae

With temperatures rising due to global warming, blue-green algae blooms have become increasingly common on Alberta lakes. Early detection is crucial because the algae produce toxins that can be harmful to humans and animals.

Second-year engineering student Jordan Eleniak is well acquainted with blooms, having grown up dodging them in Lac La Biche, Alta. Last summer, in a U of A Indigenous internship program called I-STEAM Pathways, Eleniak, who is Métis, developed a microbial fuel cell that quickly recognizes voltage fluctuations caused by the toxins, sending data to biologists over the internet. The technology is cheap and easy to produce, with materials fabricated by a 3D printer.

I-STEAM (an acronym for Indigenous science, technology, engineering, arts and mathematics) provides Indigenous undergraduate students from any recognized post-secondary institution the chance to engage in environment-related research.

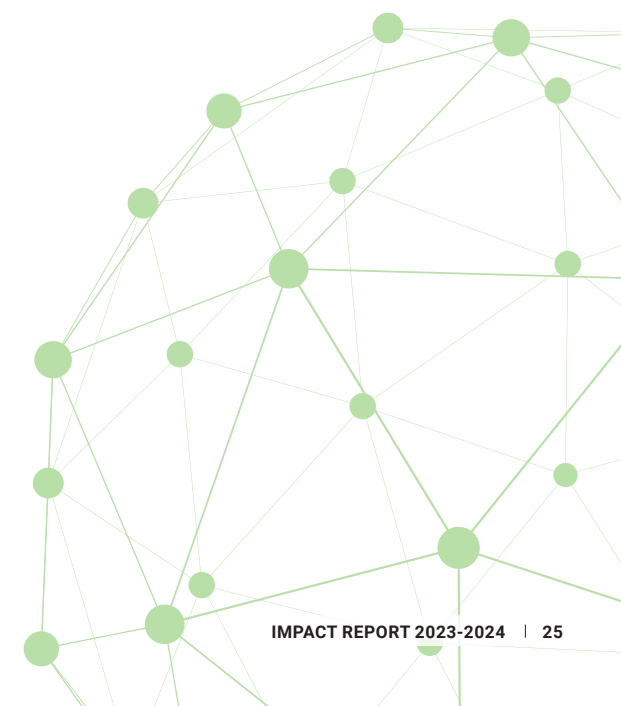
Innovative Union of Engineering, Sociology and Indigenous Insights

Emily Quecke's internship as a land consultant in Beaver First Nation revealed the often-overlooked importance of clean water, especially in Indigenous communities. Raised in Alberta and born on Prince Edward Island, Quecke was unfamiliar with water advisories common in Indigenous areas. During her time at the University of Alberta, she learned from elders about the spiritual significance of naturally sourced water and the drawbacks of chemical treatments.

This experience highlighted the need for engineers to consider alternative water purification methods, such as UV disinfection, that align with Indigenous

beliefs. Now a civil and environmental engineering student, Quecke is driven by the challenge of water security. Her PhD dissertation combines engineering solutions with community consultation, integrating Indigenous perspectives.

Quecke hopes her consultative approach in environmental engineering will serve as a model for future research projects, fostering better understanding and collaboration between engineers and Indigenous communities.





Thank You, Donors!

Students participated in the Fred Otto DiscoverE Program, in which youth explore different engineering topics and disciplines to demystify the field

What Donors Do

Callie has been part of the donor-funded engineering opportunities since childhood – and now she’s building a new industry in Alberta.

As a child, Callie Lissinna was fascinated by outer space and joined the University of Alberta’s donor-supported Fred Otto DiscoverE program, which offers kids interactive engineering activities. DiscoverE’s camps, including those that create dedicated opportunities for girls, helped Lissinna feel comfortable in engineering spaces. She later studied

engineering at the U of A where she joined AlbertaSat, a donor-funded student club that put the first Alberta-made satellite into space. Today Lissinna is the co-founder of Wyvern, an Edmonton company that builds satellites to capture high-resolution Earth photos for agriculture, wildfire and other uses.

Founded in 1993 to promote diversity in engineering, DiscoverE now focuses on engineering to address its absence in school curricula. The program reaches about 27,000 youth annually, including

2,500 Indigenous students, through camps and workshops across Western Canada. More than 500,000 kids have been to a DiscoverE camp. It prioritizes diverse staff representation, hiring U of A undergraduates to inspire young campers.

Director Ilana Young, herself a former participant, sees DiscoverE as pivotal in making engineering accessible to all children. “I want my children and my friends’ children to see that engineering is a viable option for them,” she says.



Three Among Many

We are grateful to our thousands of donors. We’d like you to meet three of them.

Growing up on a mixed farm in Winfield, Alta., the Broks brothers – Leo, Corry and Martin – learned hard work early. Sons of Dutch immigrants, they balanced farm chores with a strong emphasis on education, with all three eventually earning civil engineering degrees from the University of Alberta.

In 1976, Leo founded Al-Terra Engineering Ltd., an Edmonton engineering and landscape design firm. Corry and Martin joined the company later, with Martin managing the Red Deer office after its acquisition. Leo led Al-Terra as president and CEO for 32 years, succeeded by Corry for another decade. The current president, Sheldon Hudson, started as a U of A co-op student, reflecting the company’s commitment to nurturing talent.

Corry was drawn to civil engineering for its practicality and versatility. He worked in various sectors, including municipal engineering and transportation planning, and managed significant projects like the Walterdale Bridge.

In 2000, Al-Terra split into two companies: Al-Terra Engineering Ltd. in Edmonton and Aptus Engineering Ltd. in Red Deer, led by Martin. Both companies remain employee-owned, fostering a culture of reciprocity and community involvement. To the Broks brothers, giving back has always been a top priority. In addition to their support of co-op students, many of whom have become full-time employees, Al-Terra Engineering also supports the Broks Family Bursary in Civil and Environmental Engineering.

“Most people want variety in their work life and civil engineering gives you that opportunity,” says Martin.

Your Generosity Makes All the Difference

Engineers are problem-solvers, tackling some of our world’s most difficult social, economic and environmental challenges, and your generosity creates a collaborative and innovative culture where students and researchers flourish and meet these challenges head-on. You empower our students, faculty, staff and researchers to flourish. With your support, the faculty is advancing student and research programs, bolstering our scholarships and bursaries, and continuing to offer our students every learning opportunity possible to help them on their path to innovation.

\$13.5M

Total value of gifts received this fiscal year

Contact give2engineering@ualberta.ca to learn more.

STUDENT SUCCESS



Student Clubs and Project Groups

More than 20 engineering student clubs and project groups provide hands-on opportunities to develop real-world skills. For example, AlbertaSat is building Alberta's second-ever satellite, which will monitor wildfires. EcoCar designs and manufactures hydrogen fuel cell vehicles, competing annually in the Shell Eco-marathon.

In clubs, students apply classroom concepts, make mistakes and learn, preparing them for industry careers. Students routinely credit their club experiences for helping them become work-ready. Students also have the opportunity to get involved with student governance and leadership by joining a discipline club such as the Engineering Students' Society (ESS).



Aerial Robotics Group (UAARG):

Designs and develops autonomous aircraft for competition

Aero Design: Designs and builds a fixed-wing, unmanned aerial vehicle capable of delivering a payload

Albertaloop: Aims to help realize a hyperloop through research, community outreach and competitions

AlbertaSat: Designs, builds, tests, launches and operates cube satellites

Autonomous Robotic Vehicle Project (ARVP): Designs, builds and competes aquatic robots

University of Alberta BioNIX: Alberta Bionix strives to create a more physiologically inclusive world through the development of accessibility technologies.

EcoCar: Designs and builds hydrogen fuel cell vehicles for international efficiency competition

Engineers In Action: Works with underserved communities creating access to resources and economic opportunities

Formula SAE (Society of Automotive Engineers): Designs and builds a formula race car for competition

Future Creators: Engineering-based workshop and mentorship series for students in Grades 7 to 12

Great Northern Concrete Toboggan Race (GNCTR): Designs, builds and competes with concrete vehicles since 1974

Renewable Energy Design: Spreads awareness about green energy for the environment and the economy

RoboMaster Robotic Competition Team: Designs and builds robots for two yearly international competitions

Space Exploration Alberta Robotics (SPEAR): Promotes space exploration technology and robotics through educational outreach

Student Team for Alberta Rocketry Research (STARR): Develops, tests and launches high-altitude sounding rockets

"It's not something that you expect a group of students to take on because of the technical complexity. Tech and technology development, debugging, working through problems, designing or planning the various phases of a mission gives you skills that are really useful once you graduate."

Thomas Ganley
AlbertaSat project manager

"A lot of what we do in class is theoretical. So with EcoCar, a huge focus is hands-on experience. If you want to design something, design it. And after you manufacture it, you're probably going to find it didn't meet your expectations. But you're going to make mistakes, learn and get better"

Rafid Khan
EcoCar project manager

Experiential Learning Spotlight

8 Top 3 place finishes at competitions

20 Projects **600** Students in the projects

~\$100,000

of sponsorship funding from industry for the projects

(23/24 - monetary only not including in kind sponsorships)



Leading Our Centres and Institutes

The centres and institutes within the Faculty of Engineering allow faculty members, students and research staff to concentrate on specific areas or applications of engineering. This focused approach leads to deeper expertise and more impactful research outcomes. Engineering problems are complex and can require expertise from multiple disciplines. Our centres and institutes facilitate interdisciplinary collaboration between engineers and researchers elsewhere

in the College of Natural and Applied Sciences and across the institution. They provide a platform for forging closer ties with industry partners, exposing students to real-world problems and practical applications. Some also conduct outreach activities to engage the broader community. They enable focused pursuit of innovation in the University of Alberta's research areas. We are pleased to introduce our directors and leaders.

NAME OF CENTRE OR INSTITUTE	DIRECTOR	FUNCTION
Centre for Energy and Mineral Processing (CEMP)	Arvind Rajendran	A hub for activities and a funding program supporting energy and mineral processing research in collaboration with industrial partners
Canadian Centre for Welding and Joining (CCWJ)	Patricio Mendez	A facility employing researchers at all stages of their career; research focuses on steel applications and product development
Canadian Underground Infrastructure Innovation Centre (CUIIC)	Alireza Bayat	A research and education centre focused on important issues of underground infrastructure
Canadian Institute of Steel Construction (CISC) Centre for Steel Structures Education and Research	Ali Imanpour	Committed to developing education and research programs to support innovative and industry-leading research advancements to address specific needs of industry
Construction Innovation Centre (CIC)	Yasser Mohamed	Integrating a constellation of research and education into a single point of construction expertise to provide the best opportunities for construction innovation
Imperial Oil Institute for Oil Sands Innovation (IOSI)	Natalia Semagina	Promotes and builds capacities and funds research with commercialization potential that leads to environmentally, economically and socially responsible development of Canada's mineable oilsands resources
Water Research Centre (WRC)	Mohammed Gamal El-Din	Tackles a wide range of global water challenges across various disciplines, including sociology, rural economy and Indigenous communities

Reconnect with us!

Whether you are celebrating a BIG anniversary or would like to volunteer or connect with fellow alumni, the Faculty of Engineering would be thrilled to hear from you!

Contact katherine.kupchenko@ualberta.ca



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