



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Brilliance Building

WE'RE BUILDING A DESTINATION FOR SCIENCE LIKE NO OTHER

Help build the future of science in Calgary

Alberta is powered by science and entrepreneurship. They're the engines that drive our growth — from the thriving energy, agriculture and tech sectors that are foundational to Canadian prosperity, to the thousands of startup companies that call our province home.

We need to keep that growth going, yet Canada faces an increasing shortage of science, technology, engineering and math (STEM) talent, and, even with record-high enrolment at the University of Calgary, there aren't enough seats available to meet the country's growing need for work-ready graduates.

We have a solution.

We're investing in game-changing new facilities that will be a hub for developing tomorrow's leaders, creating space for more STEM students while driving cutting-edge research and strengthening connections with industry to accelerate discovery and real-world impact.

“The future of science is being shaped at UCalgary. By building an iconic space, our brightest minds will make breakthrough after breakthrough.”

— DR. KRISTIN BAETZ, PHD | DEAN, FACULTY OF SCIENCE, UNIVERSITY OF CALGARY



Invest in STEM

Unlocking a world
of possibilities.

Since the 1960s, UCalgary has been at the forefront of groundbreaking discoveries.

Empowered by our own brand of ingenuity, our scientists have achieved things that have never been done before. We developed a computer programming language the world didn't know it needed. We pioneered ways to pull greenhouse gases out of the air and safely lock them underground for the benefit of future generations. We established the world's largest network to monitor solar activity across Canada's north, helping to protect critical telecommunication and arctic defense systems.

We've built one of the strongest foundations for multidisciplinary science and research in the country. And we've become one of the best universities in Canada at using our research to drive new businesses that create jobs and improve our way of life. We are quietly changing the world.

“Science creates opportunities to think differently about the world. We imagine the future and work to create what was once deemed impossible.”

— DR. ED MCCAULEY, PHD, FRSC | PRESIDENT AND VICE-CHANCELLOR, UNIVERSITY OF CALGARY



**Our work is
just getting
started.**

We are making a \$450-million investment in Alberta's future, building a new Science District that will unlock our full potential and help to solve some of today's most pressing challenges. This vision is well on its way to becoming reality with a combined commitment of approximately \$350 million from the Government of Alberta and the University of Calgary. We are now seeking the support of donors, funding agencies and industry partners to secure the remaining \$100 million.



“To maintain Alberta’s thriving economy, which is fuelled by energy, agriculture, biotech and aerospace, we must continue to stay at the forefront of world-leading science through the University of Calgary.”

— MARK LITTLE, BSC '85, COMMUNITY CHAMPION LEAD

Economy Building

Driving the new economy, putting our city and university on the map, one solution at a time.

Alberta's success is built on science and technology — and our future relies on it more than ever.

But science demands a new way of working — one built on collaboration, flexibility and access to cutting-edge technology. To fully meet this demand, we're reimagining how we do research and inspiring a new generation of entrepreneurs, industry leaders, disruptors and problem-solvers.

The new Science District will revolutionize how we pursue science, boldly accelerating breakthroughs and fully engaging our students in the world of scientific discovery.

A strong economy starts here.

Canada is facing a nationwide shortage of STEM talent.

The technology-dependent economies of Calgary and Alberta risk stunted innovation and decreased economic growth without these skilled professionals.

Investing in STEM talent creates competitive advantages.

2/3
of our graduates stay in Calgary

UCalgary graduates continue developing our community and accelerating our economy.

2,000+
more students

The Science District will accommodate more than 2,000 additional Faculty of Science students, an increase of more than 30%.

Building capacity with a new Science District that will:

- › Focus on cultivating Alberta's science advantage and meeting the evolving needs of a diverse economy.
- › Grow tomorrow's leaders by pairing exceptional science education with hands-on experience and essential skills.
- › Deliver Alberta's next generation of innovators.



Opportunity Building

Powering radical research relationships.

Focusing on areas vital to Alberta’s growth.

Leveraging UCalgary’s existing areas of strength, the Science District will do away with the traditional silos between scientific disciplines, creating flexible **multidisciplinary research neighbourhoods** focused on areas that drive Alberta’s economy now and in the future:

NEAR-EARTH, SPACE AND AEROSPACE

- › Leveraging UCalgary’s world-leading space expertise to advance understanding of space weather’s impact on the earth, and drive innovations in the space-exploration and aerospace sectors.

NEUROSCIENCE

- › Integrating neurophysiology with other disciplines to advance our understanding of brain development and create more opportunities for innovation.

QUANTUM-NANOTECH CHEMISTRY

- › Creating and characterizing nanomaterials to enhance and support quantum innovation and provide more opportunities for future students.

Featuring a new multidisciplinary research building and strategic renovations of existing lab and classroom space, the state-of-the-art Science District will allow scientists, students, startups and big industry to tackle our most vexing challenges through collaboration and innovation.

Solving the world’s most complex challenges requires dynamic collaborations that break down traditional boundaries, bringing together science, business, policy, law, health and engineering to create holistic solutions.

UCalgary is pursuing a new paradigm for how science is done — building bridges across disciplines to explore every angle of a problem, inviting the community to be part of the journey, and embedding students in all aspects of the research and innovation process.

AGRICULTURE AND PLANT GENOMICS

- › Bringing together scientists in biology, genomics and computing to address food security and our evolving climate.

CHEMISTRY ENERGY INNOVATION

- › Advancing new materials, processes and technologies to improve renewable energy, energy storage, emissions management and other solutions for a sustainable future.

ENERGY PATHWAYS

- › Finding new approaches to producing Alberta’s energy resources to strengthen Canada’s leadership in responsible energy development.

HEALTH INNOVATION

- › Tackling pressing health issues with new biotech technologies to enhance human, animal and plant health.



Building an innovation hub that will feature:

- › Adaptable research floors with open-concept labs designed to facilitate multidisciplinary discoveries now and in the future.
- › Collision spaces to foster collaboration and break down barriers that stifle innovation.
- › Flexible working spaces that encourage collaboration across campus — engineering, medicine, policy, law — allowing science to drive innovation.

Integrating Efficiency and the Power of Big Data

The Science District will feature shared core facilities, providing researchers and industry partners with leading-edge lab equipment, services and expertise that they could not access on their own. This centralized approach will include computer science support to help analyze information, find patterns and model complex systems, enabling researchers to work faster and more efficiently than ever before.

Capacity Building

Preparing students for the real world.

Students in the Department of Earth, Energy and Environment have the opportunity to immerse themselves in a variety of geoscience field courses across North America that provide hands-on experience studying geologic structures, collecting and analyzing data, and working in rugged outdoor conditions.

The global economy demands that today's professionals be natural collaborators with a deep grasp of the scientific, political and socio-economic factors at play across industrial sectors. How we navigate this dynamic has huge implications for Canada's prosperity. And, with the growing shortage of STEM talent, the challenge could not be more pressing.

UCalgary is answering the call, training students in the core science disciplines while instilling the broader skills they need to hit the workplace running. Expanding hands-on learning, participation in research, field schools and work co-ops is a top priority for the Faculty of Science. And most of our graduates choose to build their careers in Alberta thanks to the opportunities and connections forged through their education.

TRAINING TOMORROW'S ENERGY LEADERS

We're launching **Canada's first Energy Science Bachelor of Science degree program** to prepare students for the evolving energy sector. The program will give undergraduates a strong foundation of how all forms of energy—from conventional oil and gas, nuclear, and renewable power to hydrogen, biofuels and batteries — is produced, transported and used, fostering a holistic view of the energy ecosystem.

As one of Canada's top research-intensive universities based in the heart of the nation's energy industry, UCalgary students have direct access to the experts tackling the most pressing energy challenges and the most promising energy opportunities — paving the way for groundbreaking solutions that will change the world.

800+
work placements in oil and gas.

In 2024, more than 800 UCalgary students did co-ops and work placements in Canada's oil and gas sector.

Building learning spaces that will feature:

- › Active-learning classrooms that promote teamwork and open discussion.
- › Outdoor learning spaces that incorporate vegetation, geology, Indigenous knowledge and the university's vast scientific collections to engage students in hands-on learning and discovery.
- › A Science Success Centre to connect students with research opportunities and work co-ops, provide workplace skills training, and assist with job applications, interviews and graduate studies.
- › Gathering spaces for students, faculty and industry experts to share ideas and spark creative thinking.

Solution Building

Opening more doors and creating more entrepreneurial opportunities.

As one of Canada's most entrepreneurial universities, UCalgary is constantly thinking outside the box when it comes to turning curiosity-driven research into new products and services that benefit society.

One of these companies is RetinaLogik, which is improving accessibility to eye care by leveraging the power of artificial intelligence and virtual reality. The company was born out of UCalgary computer science PhD graduate Abdullah Sarhan's experience travelling to Uganda, where he was concerned to find many people suffering from lack of proper access to healthcare services such as vision screening. Sarhan devoted his PhD research to developing sophisticated AI-based solutions that can improve detection of retinal conditions, making it easier for health-care providers to diagnose and treat vision problems, especially in underserved and remote communities.

With the help of UCalgary's unparalleled support system for new ventures, RetinaLogik's technology has been approved by Health Canada for screening and diagnosis, has seen a fivefold growth in revenue, and has expanded across the country in less than five years.

The new Science District will bring academics, entrepreneurs, industry partners and students together in a shared space to maximize innovation and keep Alberta on the cutting edge of science and business. By streamlining the journey from research to implementation, we can become a catalyst for rapid progress and ensure startups have access to the latest talent and equipment in Alberta.

Building new and better ways to turn research into products and services, with:

- › Adaptable, high-service labs designed to rapidly transform to support successive startups.
- › Industry-ready collaboration spaces to facilitate deeper connections between researchers and industry.
- › Entrepreneur-in-residence initiatives to strengthen the relationship between business and science.
- › Incubator spaces to support researchers as innovators and nurture startups.



Dr. Abdullah Sarhan, MSc'16, PhD'21, (right) teamed up with fellow UCalgary alum Julia St. Amand, BKin'22, BComm'22 to found RetinaLogik in 2021 based on Sarhan's research into health applications for virtual reality and artificial intelligence.

“The investments we make in fostering discovery and innovation today will spark bold ideas, fuel economic growth, and create lasting opportunities for all Canadians.”

— ALICE REIMER, BSC'99, MBA '03, COMMUNITY CHAMPION LEAD

UCalgary is a leader when it comes to launching startup companies.

*We aim to double the number of incubated startups and become one of the **top 50 startup creators in the world by 2030**, which will transform Alberta's economy.*

Dr. Chris Clarkson, PhD, (left) leads a diverse team of researchers and students who are applying technologies from oil and gas production to improve carbon capture and storage, geothermal, and hydrogen energy development.

BRILLIANT ENERGY SOLUTIONS

Advancing Responsible Energy Systems

Bringing experts together to solve the world's energy challenges.

The world's demand for all forms of energy continues to grow, largely driven by much-needed improvements to living standards and economic growth in the global south. At the same time, the need to cut global greenhouse gas emissions and address climate change has never been more pressing. Tackling these twin imperatives is an unprecedented challenge for humanity, and many are looking to Canada, as a top energy supplier, for solutions.

From pioneering more efficient ways to develop the oil sands and produce emissionless hydrogen, to inventing new kinds of batteries and better methods of carbon capture and storage, UCalgary continues to build on our long track record of innovation in responsible energy development.

Chris Clarkson, a professor in the Department of Earth, Energy and Environment, is one of the key researchers working alongside colleagues in Alberta's energy sector. As director of the industry and government-sponsored Tight Oil Consortium, Clarkson leads a team of geoscientists and engineers focused on new technologies and processes to enhance production, lower costs, and reduce environmental impacts of unconventional oil and gas extraction. Their award-winning work includes invention of a quick and cost-effective test to assess the characteristics of hydrocarbon reservoirs in advance of full-scale hydraulic fracturing and drilling operations. Their enhanced version of the industry-standard Diagnostic Fracture Injection Test is being adopted by producers across North America, boosting efficiency and reducing the risks related to fracking in tight oil and gas plays.

Clarkson's practical approach to research and development was born out of his early career experience working in Alberta's oil patch, where he learned first-hand the value of applied research that can solve problems on the ground while methodically advancing our understanding of the Earth's natural systems. His team's expertise in unconventional reservoir oil and gas production is now being applied to geothermal energy and hydrogen development, while exploring Western Canada's vast potential for safely storing carbon dioxide emissions deep underground — a pillar of Canada's plan to reach net-zero emissions by 2050.

UCalgary leads the country in energy-related research, including patents for new oil and gas technology. The Science District will build on our legacy as leaders.

Building integrated research facilities that will feature:

- › Innovative, adaptable design that enables researchers and projects to pivot or scale quickly.
- › New revenue-generating facilities that will bridge industry and research.
- › Shared core facilities that provide researchers and industry partners with leading-edge platforms, services and expertise they could not access on their own.

Dr. Marcus Samuel, PhD, in the UCalgary greenhouse where isolation chambers are used to grow different plant strains.

BRILLIANT AGRICULTURE SOLUTIONS

Future-Focused Agriculture

Using scientific discovery to push startups forward.

East-central Alberta has faced agricultural disasters due to severe drought conditions twice in the past 20 years — once in 2021 and again in 2023. Covering more than five million acres, this region not only sustains livestock and communities, but puts food on our tables. Innovative solutions are urgently needed to help producers, and our Science District can be home to these solutions.

Marcus Samuel and Logan Skori are using scientific discovery at UCalgary to make the future of agriculture better for all of us. Samuel, a professor in the Department of Biological Sciences, is working to create hardier and more nutritious plants with gene editing. By snipping a small portion of a gene from a genetic network he discovered, Samuel has had promising preliminary results for drought-tolerance in wheat. This method mimics natural genetic adaptations, which are often based on random mutations and can take generations to develop. Drought tolerance poses a unique challenge — ideally, the plant should activate its defences only when conditions become unfavorable.

Agriculture is both professional and personal for Skori, whose passion for plants is rooted in his upbringing on a family farm. During his PhD studies under Samuel at UCalgary, he witnessed important lab work that, unfortunately remained in the lab. Concerned about the difficult decisions farmers must make regarding which seed traits to invest in each year, Skori co-founded AgGene, a biotechnology company dedicated to bridging this gap. AgGene aims to translate laboratory-developed plant traits into practical solutions that provide real value to farmers, starting with high-protein crops. With Samuel as AgGene's chief scientific officer, they are working together to tackle the challenge of drought tolerance to support the increasing number of farmers facing an uncertain future.

\$65.1B
global market size
for crop protection.

\$41.7B
global market size for
commercial seed.

Building an agri-tech greenhouse that will feature:

- › Climate-controlled and energy-efficient bays to grow thousands of plants under a wide range of environmental conditions, including simulated droughts and floods.
- › State-of-the-art technology to accelerate plant science through robotic automation, and artificial intelligence for rapid identification and classification of plant traits.
- › A teaching lab integrated for hands-on learning and research.

Battling Bacteria to Save Lives

Creating spaces where life-saving discoveries are made.



Microbiologist Dr. Joe Harrison, PhD, (right) and chemistry professor Dr. Belinda Heyne, PhD, are working together to understand the nature of biofilms and developing new tools using light and nanotechnology to fight deadly infections and battle antibiotic resistance.

Imagine a world where a skinned knee leads to a leg amputation as the only option to combat infection, or where hip and knee replacements are deemed too risky due to a lack of effective antibiotics.

At UCalgary, researchers from diverse disciplines — chemistry and microbiology — are working together to stay ahead of the exponential growth of drug-resistant bacteria, developing innovative strategies to combat antimicrobial resistance. This collaborative effort is leading to game-changing discoveries in health innovation and putting UCalgary on the map.

Within the world of Microbiology, Joe Harrison studies biofilms to understand how they help microbes protect, evade and evolve against threats, which is crucial for controlling bacterial infection.

Belinda Heyne applies her expertise as a photochemist to develop methods for killing microbes using light and coloured molecules. Although variations of this technique date back to Ancient Greece, it has been abandoned with the advent of antibiotics. Heyne is advancing this approach through nanotechnology, creating a “nanopaper” and dyes that can penetrate biofilm defences. This innovation is crucial because biofilms shield bacteria from conventional treatments, making infections difficult to eradicate.

Working together, they found that irradiating biofilms with ambient white light and Heyne’s nanopaper for just 30 minutes completely eradicated them. This represents a novel, non-invasive treatment strategy that could reduce reliance on traditional antibiotics, which are becoming less effective. However, they also discovered that some proteins in bacteria can expel dyes from cells, revealing an adaptive response that complicates treatment efforts. Understanding this resistance mechanism is vital for developing more effective therapies, and this discovery has the potential to significantly influence standard of care for infections.

Powerful, complex and well-facilitated teams will drive the kind of groundbreaking changes that no single researcher, group or organization can deliver alone — but they need the space to facilitate this game-changing work.

The global human health and economic burden of biofilm infections exceeds

\$430B
annually.

Brilliance Building

Building labs that will feature:

- › Open-concept plans that support collaboration, community-engaged research and workplace-ready educational opportunities.
- › Incubator spaces to enrich and elevate research translation and strengthen industry partnerships.
- › Prototyping and testing facilities that facilitate rapid design iterations and timely deliveries.
- › Team-oriented design to support UCalgary’s startup culture.

Graduate student Emily Knight (left) is combining her engineering skills with experience and mentoring in physics under the supervision of physics and astronomy professor Dr. Emma Spanswick, PhD (centre) and engineering professor Dr. Susan Skone, PhD (right).

BRILLIANT AEROSPACE SOLUTIONS

Safeguarding Canada's North

Building spaces for world-class collaborations.

Space weather — the stream of gas and particles from the sun that constantly bombard the Earth — remains poorly understood, yet it can wreak havoc on the satellites, electrical grids and telecommunications we rely on every day.

Our national security depends on long-range radar systems that continuously monitor for threats — missiles, planes or even drones — yet this radar can be disrupted by space weather, compromising our ability to detect and respond to potential threats. This is not merely hypothetical, it highlights a stark truth: as our reliance on technology grows, so too does our vulnerability to these cosmic phenomena.

Emma Spanswick and her multidisciplinary team of physicists, electrical engineers, mechanical engineers, geomatics specialists and computer scientists are developing next-generation instruments to study the space environment, with hundreds of pieces of equipment installed across Canada's north to gather critical data. She collaborates with Schulich School of Engineering professor Susan Skone on real-time prediction tools funded by the Canadian Space Agency and the Department of National Defence. Together, they are creating a system that automatically adjusts the launch angle of Canada's northern defence radar to account for disruptions caused by moving electrons and protons, enhancing the radar's ability to detect fast-moving objects approaching the pole.

Documenting, defining and describing are some of the hallmarks of foundational science. Spanswick and Skone use real-time data to adapt devices that are working in the field. Collaborations like this, where foundational science is needed to solve real-world problems, will thrive in flexible lab spaces and engage other researchers and industry.

UCalgary is Canada's most space-active university, engaged in space research for 50 years, including more than 20 space missions involving collaborations with space agencies across the world.

Building facilities that will feature:

- › A roof-top observatory and instrument test centre.
- › State-of-the-art fabrication and electronics workshops to accelerate industry projects.
- › An advanced clean room to assemble equipment for remote locations.
- › A calibration lab and darkroom equipped for the creation of precision devices.
- › A 30+ seat teaching lab devoted to building the next generation of space experts.

Legacy Building

We're at a unique point in our story. We have the opportunity to strengthen our STEM possibilities and advance Alberta's global advantage. With your help, we can build a stronger economy and improve our ability to solve challenges that affect the whole world.

With a combined commitment of approximately \$350 million from the provincial government and the University of Calgary, this ambitious project will transform the future of research, STEM training and innovation in Alberta for the benefit of all Canadians. This crucial investment sets the foundation for bringing the Science District to life, but we need support from donors, funding agencies and industry to realize its full potential.

With your investment, we can ensure Alberta remains at the forefront of global scientific discovery and empower graduates to make a lasting impact for generations to come.

We can't do it without you.

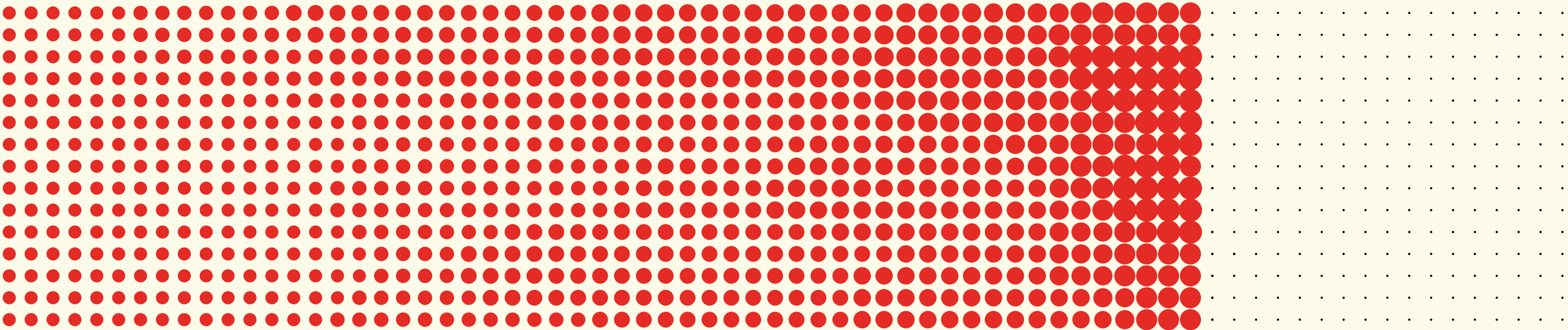
Let's build a brilliant future together.

77%

Approx. \$350 million provided by the provincial government and the University of Calgary.

23%

Remaining funding required.





UNIVERSITY OF
CALGARY

Start something.

**For more information
about how you
can make a difference
— contact us:**

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