

2026 ARIS IMPACT REPORT

Shaping the future of applied research in Canada



Applied Research
and Innovation Services





APPLIED RESEARCH AND INNOVATION SERVICES HUB

SAIT's Applied Research and Innovation Services (ARIS) Hub is one of Canada's top applied research hubs with state-of-the-art research labs and facilities. Our full-time research staff provide the services organizations need to take their products from concept to prototype.

The ARIS Hub brings together researchers, innovators, industry, communities and institutions, offering unique opportunities for student skill development while collaborating on new solutions, technologies and products that strengthen economic and environmental outcomes across Canada and around the world.

CANADA'S TOP 50 RESEARCH COLLEGES | CANADA'S INNOVATION LEADERS 2025

SAIT is ranked **fourth in Canada**, with a research income of \$12.341M

SAIT is **ranked first in research intensity**, with \$162.4k per researcher, representing efficient research output relative to personnel

SAIT is **ranked third in industry research** income with \$1.790M



LAND ACKNOWLEDGEMENT

The ARIS Hub laboratories and offices are located within SAIT facilities, situated in an area the Blackfoot tribes traditionally called Moh'kinstsis, where the Bow River meets the Elbow River. We acknowledge our facilities are inherently land-based, without which we could not create, preserve or share knowledge. We also acknowledge the relational nature of applied research which involves a curiosity about the connection with the world around us. We extend gratitude to all traditional and current land keepers for this land and for all the lands in which we live, work and play. The ARIS Hub is honoured to be welcomed into many territories as we collaborate on community-driven applied research projects.

SHAPING THE FUTURE OF APPLIED RESEARCH IN CANADA

AMBITION

To be Canada’s top applied research hub.

PURPOSE

With our partners, we develop solutions to applied research initiatives.

OUR MINDSET

HUB

GROWTH

CURIOSITY

OPEN-MINDEDNESS

CULTURAL WAYS OF KNOWING

CORE VALUES

E	P	I	I	C
Excellence	Passion	Innovation	Integrity	Community

OBJECTIVES AND GOALS

- Advance leadership in applied research
- Elevate life-long learning engagement
- Expand partner networks
- Champion a culture of resiliency and adaptability



“Applied research is essential because the challenges before us demand action more than just ideas. It puts knowledge to work, connecting researchers, students, industry and communities to solve problems that matter, strengthen our economy and improve the lives of Canadians. At SAIT, we see applied research as a powerful force for progress. ARIS takes on real challenges, tests what is possible and creates solutions that can be put to work. The greatest value of our research is not simply in what we discover, but in what we can do with it.”

– Mark Butler, Vice President, SAIT Corporate Development, Applied Research and International (CDARI)

ARIS HUB RESEARCH AREAS

CERCUTS

Centre for Energy Research and Clean Unconventional Technology Solutions

As a technology solutions provider, industry collaborator and energy innovation accelerator, we foster applied research through collaborations and partnerships. Our team of researchers are keen to advance green energy initiatives and sustain conventional energy resources. We are equipped with one-of-a-kind research facilities ready to provide solutions to national and international energy challenges as we continue to evolve towards a new age of natural resources.

GBTAC

Green Building Technology Access Centre

At GBTAC, we are redefining how we build. We support the construction and retrofit of buildings to be higher-efficiency, lower-emission, healthier and more environmentally friendly. Through advanced solutions, we develop materials, technologies and systems that improve residential and commercial construction industries as well as address social and economic realities. We support a broad range of industry partners and community members through research, innovation, education and training to create impact holistically and redefine the future of urban development.

CIRAMM

Centre for Innovation and Research in Advanced Manufacturing and Materials

At CIRAMM, we are transforming digital manufacturing and materials through a talented team of researchers and state-of-the-art facilities. The research team focuses on the synthesis and characterization of advanced materials, AI-driven digital manufacturing systems, robotics and materials informatics. By supporting innovation across emerging sectors such as aerospace, defence, energy manufacturing and construction, we are committed to creating impact at a regional, national and global level.

CIRUS

Centre for Innovation and Research in Unmanned Systems

At CIRUS, we help discover how remotely piloted systems can address some of today's most pressing global challenges. Our cutting-edge research focuses on integrating these systems with advanced sensors, artificial intelligence (AI) and machine learning to transform data into impact. We push beyond traditional boundaries and work across diverse sectors including healthcare, environmental monitoring, public safety, defence, infrastructure and wildfire management. While our focus is in the air, our research extends to terrestrial, marine and submersible autonomous innovations. By integrating leading-edge drone technologies, advanced sensing capabilities, AI-driven analytics and machine learning models, we develop solutions that improve decision-making, enhance operational efficiency and address complex challenges in Canada and around the world.



20 YEARS OF ARIS

A bold vision, two decades in the making

Two decades ago, ARIS began with two employees in a single room and a bold vision; today, it has grown into a nationally leading research enterprise that has helped position SAIT among Canada's top four research colleges.

At ARIS, we unite researchers, industry partners, students and faculty to innovate, tackle global issues and strengthen our communities. We are a hub fostering progress through research, innovative solutions and cutting-edge technology. Working in isolation is not part of our approach. By breaking down silos and connecting diverse expertise across sectors, we create stronger solutions and greater impact.

From a pair of researchers to more than 80 dedicated experts, every member at ARIS knows that the brightest ideas always start somewhere. Today, we honour that remarkable journey — because to know where you're going, you must sometimes look back.

2005
**ARIS WAS
ESTABLISHED**

2008
Engineered a
high-performance
bobsled for
the Olympics

2011
Developed
award-winning
net-zero homes

2014
Green Building
Technologies
was designated
as a Technology
Access Centre

2015
Expanded into
unconventional energy
technologies and
improved conventional
energy solutions

2021
ARIS' breakthrough
vanadium energy
storage system wins
Mayor's Innovation
Challenge

2020
Assisted in the use
of unmanned aerial
systems to deliver
medical supplies and
COVID-19 test kits to
remote communities

2022

Began initial prototype development for the NASA flow meter technology

2024

Supported the development of mobile river water purification systems for sustainable hydrogen production

Named the fourth top research college in Canada

2023

Launched the first annual Alberta Corridor Technical Symposium in partnership with different polytechnics across the province

2025

Collaborated to create Kuugalaaq, a first-of-its-kind modular cultural workspace dedicated to Inuinnaqtun immersion in Cambridge Bay, Nunavut

Designated as one of only 13 NATO Diana test Centres in Canada

2026

Signed an MOU with Polar Knowledge Canada (POLAR)

Launched international collaborations and initial expansion into global opportunities, including the signing of an MOU with the Technological University of the Shannon (TUS)

We welcome a bold new chapter as we begin our **third decade** of operations.

We are expanding into emerging industries that fit the needs of the future. Through applied research in aerospace, defence, construction, energy, AI and more, we're advancing innovation that responds to an evolving world and emerging societal needs. We continue to support student excellence and a future-ready workforce. With funding support for student innovation and hands-on research opportunities, students gain the experience and skills needed to drive meaningful change.

We are fostering a collaborative community of academic institutions ready to address complex challenges together. Through meaningful partnerships and knowledge mobilization, we share expertise and strengthen collective impact. We emphasize international collaboration to navigate our globalized environment and continue to connect with international peers to bring Alberta-made solutions to the global ecosystem.

As we commemorate two decades of success and innovation, we remain inspired by the opportunities of the future. As times change, ARIS will continue to grow with them.

Thank you for being part of our first twenty years; we look forward to the collaborations that are ahead.

ALBERTA'S INNOVATION MEETS GLOBAL OPPORTUNITIES

We continue to strengthen our national and international network through strategic collaborations that create new opportunities for applied research and innovation. By fostering relationships with organizations, institutions and international partners, ARIS is building pathways for future projects that will connect researchers, students and industry to emerging opportunities in Canada and abroad.



In May 2026, SAIT officially signed a Memorandum of Understanding (MoU) with Polar Knowledge Canada (POLAR). POLAR is dedicated to advancing science, technology and Indigenous knowledge in Canada's Arctic and northern regions and operates the Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut. This MoU marked an important step in formalizing a growing relationship, establishing a framework to support future collaboration with ARIS and Continuing Education and Professional Studies for applied research, innovation, training and capacity building in the North.



Building on SAIT's existing agreement with the Technological University of the Shannon (TUS) through an international engagement visit, opportunities for future collaborative research were identified based on mutual interests and industry needs.



With growing international interest in Canada's innovation ecosystem, SAIT welcomed delegations from around the world, including Europe, South Korea and Ireland, seeking to explore research capabilities and emerging technologies.

While some of these partnerships are still in the early stages, they play an important role in expanding Canada's research network and creating opportunities. These engagements strengthened global connections and helped position Canada as a destination for innovation, talent and investment, contributing to long-term economic development.



BRINGING RESEARCH TO INDUSTRY, COMMUNITY AND BEYOND

Through annual events – Industry Night and the Alberta Corridor Technical Symposium – we create opportunities to share applied research outcomes, foster meaningful connections, support knowledge mobilization and showcase impacts of innovation in the province. Essential to the innovation ecosystem, these events extend the reach of research beyond the lab, encouraging collaboration, increasing awareness around applied research and accelerating the adoption of new ideas and technologies.

Annual Industry Night

Building on the annual ARIS Industry Night, the inaugural Corporate Development, Applied Research and International (CDARI) Industry Night brought together more than 150 attendees from over 70 organizations across industry, government, post-secondary institutions and community organizations. Centered on the theme Innovation, Skills and Global Partnerships for a Stronger Canada, the event showcased ARIS' capabilities through facility tours and research demonstrations, highlighting how innovation moves from exploration to implementation. Connecting a diverse audience, including many first-time visitors to SAIT, the event increased awareness of applied research impact and reinforced SAIT's role as a catalyst for innovation and economic growth.



Annual Alberta Corridor Technical Symposium

The Alberta Corridor Technical Symposium continues to serve as a platform for showcasing polytechnic-led applied research and strengthening Alberta's innovation ecosystem. Delivered in collaboration with SAIT, NAIT and Red Deer Polytechnic, the annual event brings together industry, funders, innovators, researchers, and community members to share knowledge, explore emerging challenges and solutions. In 2025, the symposium featured 28 research presentations spanning sectors such as energy, environment, manufacturing, construction, digital technologies, unmanned systems, agriculture and health. Additionally, the symposium highlighted emerging talent through a student poster showcase featuring 10 research projects, which provided students with valuable opportunities to share their research and engage directly with the innovation community. We gratefully acknowledge the ongoing support of Alberta Innovates in helping make the Alberta Corridor Technical Symposium possible.



STUDENT ENGAGEMENT

Supporting future talent

Student engagement is a priority for ARIS. In the last year, we achieved a remarkable milestone by supporting more than 2,000 SAIT students across all nine schools of study and 600 non-SAIT students, including international and Indigenous high school students. This allows us to engage with the next generation of talent and transform their classroom creativity into real-world impact.

We bring one-of-a-kind opportunities in all areas of study for students to work alongside ARIS researchers and industry partners through curricular and non-curricular pathways. This includes projects, capstones and practicums, as well as part-time jobs, summer research assistant positions and immersive lab visits.

Our commitment to students continues through our Student Innovation Funds, made possible by our multi-donor fund and Imperial Oil. By offering up to \$5,000 in reimbursement for project costs in capstone and applied research curricular projects, we are bringing innovative ideas to life. Over the past year, these funds supported 82 students through 24 capstone projects.

Did you know

In Fall 2025, Nicholas Hunter, Research Technologist at CIRUS, taught the Remotely Piloted Aircraft Systems (RPAS) – Professional Flight School course along with two instructors from SAIT's School of Transportation.

The cross-collaboration and ARIS' involvement provided insights to the students from an applied research and industry perspective, including the diverse range of applications, data collection, flight practices, safe operations, mission planning, environmental assessments, understanding limitations, decision-making and career opportunities. These insights are essential for students transitioning from learning to operating RPAS professionally in the field.





"It was fascinating to learn from ARIS about how buildings are managed and optimized for energy consumption. I've always loved to see how things work and being able to create such a thing is a truly wonderful feeling. I am certain that this project will be a cornerstone of my portfolio for years to come."

– Robert Macklin, Software Development student at SAIT

"Designing the database behind a system a real lab depends on and mapping CIRAMM's actual workflows to build it around, meant working from real processes instead of a hypothetical case study. Karla's questions about how the data and workflows would be used in practice sharpened a lot of our design choices. Working with ARIS gave me a much clearer sense of what production-quality work looks like."

– Priyanshu Patel, IT Project Management international student at SAIT

"The opportunity to work with ARIS on our capstone project showed me how modern technology can create meaningful solutions and make a positive impact on users. GBTAC explained the requirements clearly, gave us a tour of the facility to help us better understand their work and was always available to answer our questions. Developing a platform for building data integration that supports better decision-making for energy optimization made our work feel meaningful."

– Reiner Justin Realica, Software Development student at SAIT

LABS4

Supporting researcher-entrepreneurs

The first year of Labs4 was a huge success. Funded by the Government of Canada, Labs4 is a Canada-wide network of colleges and universities working in partnership to empower researcher-entrepreneurs to turn academic breakthroughs into real-world ventures, products and solutions. While many entrepreneurs have promising innovations with commercial potential, systemic barriers can limit access to the training, mentorship and networks needed to bring those innovations to market. Labs4 is committed to breaking down these barriers and building pathways for all.

As the Labs4 Southern Alberta Hub, SAIT supported 13 researcher-entrepreneurs through the Technology Readiness Level-Up Program (TRL). The researcher-entrepreneurs included students and recent graduates from the undergraduate level through to Postdoc. The support included stipends for participants, access to ARIS labs, national workshops, mentorship and connections to technical advisors from SAIT, University of Calgary, Red Deer Polytechnic, Kwantlen Polytechnic University and Centennial College.

The research projects varied from Cleantech, unmanned aerial vehicles and sensors, healthcare and medical devices, AI and software, robotics and microbiology. Since completing the program, participants have seen tremendous success, including securing funding, expanding their teams, advancing to later stages such as prototype development and attracting significant interest from governments and potential investors.

12 OUT OF 13

researcher-entrepreneurs continued their commercialization journey.

\$195,000

in government funding awarded to participants as funding for stipends, materials and technical advisor support.

22

technical advisors – primarily researchers and some faculty – and mentors supported supported participants through their TRL journey.



To make his project — creating automotive hand controls for drivers with disabilities — possible, Dante worked with RDP and ARIS.

“My product makes a driving experience as user friendly as possible for users, facilitating an experience similar to driving for people with no physical impairments. This product will make driving less fatiguing, allow two-handed control of the steering wheel and empower drivers. SAIT assisted in this research by contributing expertise as well as access to equipment. During the project, I worked with SAIT’s technicians, technologists and CIRAMM’s Principal Investigator Craig Maynard, who provided valuable insight during the ideation phase of the electronic systems.”

— Dante Bravi, Automotive Service Technology, SAIT, Class of 2025

Alongside technical advisors from CERCUTS, NanoStrip’s Chief Technology Officer Pirouz is developing a system that removes ammonia and hydrogen sulfide from waste streams such as biodigesters and municipal wastewater.

“My experience has been rewarding, working with everyone at SAIT to get my project underway. Everyone has been supportive, from the onboarding team to the technical engineering team, in ensuring we make solid progress during the Labs4 program. We were able to create detailed roadmaps and deliverables for the four months at SAIT and set up a clear path for successful outcomes.”

— Pirouz Kiani, student researcher, University of Calgary

Alongside technical advisors from CERCUTS, Jack, one of TurnCO2’s founders, is working to make brewery operations more sustainable by developing a compact, brewery-scale carbon capture system that enables small and mid-sized breweries to recover and reuse the CO₂ released during fermentation.

“The Labs4 program has been incredibly valuable, not only in terms of mentorship and networking, but particularly through the workshops. Sessions on customer discovery helped us better define our value proposition and refine our go-to-market strategy, while workshops like AI in business sparked new ideas for automation, data handling and operational efficiency. The program has pushed us to think more like a startup rather than just a technology team.”

— Jack Jarvis, PhD, P.Chem

P2INACLE

Advancing innovation across the prairies

The Prairie Polytechnic Innovation Network Accelerating Commercialization for Local Ecosystems, known as P2INACLE, is receiving an additional \$586,000 over two years from Prairies Economic Development Canada to advance Prairie innovation, building on an earlier commitment of nearly \$900,000 announced the previous year.

P2INACLE is an applied research network bringing together the expertise and state-of-the-art facilities of six polytechnics across the Canadian Prairies — NAIT, Northwestern Polytechnic, Red Deer Polytechnic, RRC Polytech, Saskatchewan Polytechnic and SAIT — to spark innovation, fuel economic growth and drive transformation across the region and beyond.

P2INACLE offers strong benefits to students as well. Through participation in research projects, they gain exposure not only to their home institution but also to partner polytechnics, broadening their skills and experience in ways that would be difficult without a collaborative network. At the same time, employers gain access to emerging talent and graduates leave with practical, job-ready skills.

Administered at Saskatchewan Polytechnic, the network launched its first pilot in early 2025 along with the International Minerals Innovation Institute (IMII). The initiative brought together polytechnics and industry partners from across the prairies to identify challenges in the mining and minerals sector and develop practical, market-ready solutions. In its first year, eight mining-focused research projects were completed.

At SAIT, CIRUS collaborated with Saskatchewan Polytechnic's Sustainability-Led Integrated Centres of Excellence (SLICE), IMII and Nutrien, to develop new imaging approaches and improve how potash mines are explored. The project involved investigating various frequencies of electromagnetic spectrum and the possible use to develop an imaging system to view beyond the visible boring face in potash mines. Researchers conducted an extensive literature review to understand how different frequencies of electromagnetic radiation interact with different soils. The project also included an assessment of existing imaging technologies and aimed to identify the most effective frequency ranges for subsurface visualization.

"The successful completion of the project demonstrated the value of bringing together expertise from industry, applied research at institutions and innovation organizations to address complex challenges in resource exploration"

— Wade Hawkins,
Research Chair, CIRUS



APPLIED
RESEARCH

NORTHWESTERN
POLYTECHNIC



Red Deer
Polytechnic



RRC POLYTECH



SAIT

ENHANCING WASTEWATER TREATMENT

Removing emerging contaminants from water

“For decades, many contaminants in our water systems haven’t been consistently monitored or regulated, such as pharmaceuticals, not because they were unknown, but because conventional treatment systems weren’t designed to detect or remove them,” says Dr. Molood Barmala, Senior Water Scientist, CERCUTS. “Now, that’s shifting. As emerging contaminants come into focus, their persistence in the environment, ability to accumulate in living organisms and potential impacts are creating new priorities for monitoring and treatment.”



Over two years, CERCUTS brought together expertise in process engineering, chemical research and data analytics to enhance BioLargo Canada’s Advanced Oxidation System (AOS) practical wastewater treatment application for contaminated wastewater streams.

The research project successfully demonstrated the removal of targeted pollutants, providing proof of effectiveness under real operating conditions. It also established recommended operating ranges and performance parameters to support more predictable outcomes and improved compatibility of the technology. These results create a more consistent approach to assessing additional pharmaceutical contaminants, while supporting the ongoing advancement of treatment technologies and analytical methods as part of future research and deployment.

Beyond the technical outcomes, the work supports technology adoption, business growth and the creation of skilled jobs in Alberta as deployment expands.

This is what applied research is all about, bringing together expertise and partnerships to support innovation that addresses today’s challenges, along with shaping more resilient systems for the future.

Thank you to BioLargo Canada, Natural Sciences and Engineering Research Council of Canada (NSERC) and Alberta Innovates for their support with this work.

A SIMPLE PROMISE

Our commitment to Canadian energy goals



Canada has made a national commitment to transition the economy away from fossil-fuel reliance — a milestone known as the Net-zero 2050 goals. At ARIS, we believe residential sustainability and urban energy efficiency are central to achieving this mission of a greener future. GBTAC is pioneering projects that promote effective energy transitions and foster the climate-resilient housing our communities deserve.

A new way to learn: to build a workforce fit for an urban future, SAIT's Continuing Education and Professional Studies (CEPS) is launching a Residential Deep Energy Retrofit Certificate in Fall 2026, with support from ARIS. Developed in partnership with Retrofit Canada, the course teaches the skills needed to retrofit homes. The curriculum will be offered across Canada through collaborations with post-secondary institutions, making ARIS a leading collaborator in ensuring these skills become accessible nationwide. This project is funded by Natural Resources Canada's toward net-zero homes and communities program.

A hub for knowledge: innovation begins with knowledge. In partnership with Retrofit Canada, we developed the National Retrofit Repository — a one-stop online database. This free resource features a library of case studies, collection methods, construction details and guides for various building types, providing people with technical support and useful data that empowers them to navigate the complexities of residential retrofitting with confidence. This project is funded by Natural Resources Canada's Greener Neighbourhoods Pilot Program (GNPP).

An affordable design: a sustainable future does not have to mean unaffordable housing. We partnered with the City of Calgary and the City of Edmonton to assess how climate technologies impact the affordability of single-family and semi-detached homes. The research discovered more than 660 possible house upgrade combinations that achieve net cost savings or break-even outcomes, proving how Albertans can achieve sustainable climate goals while safeguarding housing accessibility.



Adoption of new energy codes: we are helping jurisdictions adopt modern energy codes to successfully decarbonize the building sector. Under the Canada Green Buildings Strategy and in partnership with the City of Calgary, holistic training programs for Alberta’s municipalities were established. To date, 304 municipal personnel and 77 industry representatives have been successfully trained, equipping our workforce with the leadership and technical skills needed to facilitate the adoption of higher energy code tiers and greener practices. This project is funded by Natural Resources Canada’s Codes Acceleration Fund (CAF).

The power of knowing: we are collaborating with Alberta Ecotrust to support Alberta’s Part 3 commercial building stock. Alongside partners at the Pembina Institute, Alberta Energy Efficiency Alliance (AEEA), City of Calgary and City of Edmonton, ARIS is raising public awareness of commercial deep retrofits. Eight Discovery Sessions are being delivered to share industry knowledge, with the first five sessions completed successfully. This project is funded by Natural Resources Canada’s Deep Retrofit Acceleration Initiative (DRAI).

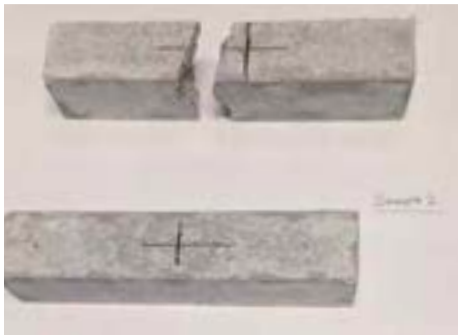
At ARIS, we continue to align with Canada’s most vital interests. We are strengthening pathways towards Canada’s net-zero 2050 goals and continue to support a more resilient, affordable and sustainable future for all Canadians.

“Not only are buildings critical infrastructure, they are made up of hundreds of innovations that we don’t see behind the walls. We need to peel back those layers to help solve current problems like housing affordability and climate resiliency, among many others.”

— **Melanie Ross, Research Chair, GBTAC**

WAWANESA CLIMATE CHAMPIONS

Enhancing the durability of low carbon concrete



One of the construction industry's most significant climate challenges is the high greenhouse gas emissions associated with ordinary portland cement, which accounts for most of concrete's embodied carbon. The Wawanesa Youth Innovation Grant awarded to one of our student researchers at CIRAMM, provided an opportunity to develop lower-carbon, more durable concrete for sustainable infrastructure.



The research investigated the use of treated supplementary cementitious materials (SCMs) as a partial replacement for portland cement, targeting a 20% cement substitution while maintaining or improving long-term durability. Beyond reducing embodied carbon, the research focused on ensuring that low-carbon concrete remains suitable for Canada's demanding environmental conditions by evaluating durability-related properties such as drying shrinkage, capillary water absorption, carbonation and freeze-thaw resistance.

What we achieved

Developed and evaluated low-carbon concrete mixtures incorporating treated SCMs.

Completed a comprehensive experimental program evaluating both durability and mechanical performance.

Conducted a life cycle assessment to quantify potential reductions in embodied carbon.

Provided hands-on applied research experience for a student climate champion through laboratory testing, data analysis and technical reporting.

Mobilized technical knowledge through conferences, student engagement activities, institutional events and LinkedIn outreach supporting the development of sustainable construction technologies.

We would like to thank Wawanesa Insurance and Canadian Colleges for a Resilient Recovery for investing in youth-led climate innovation across the country.

In 2026, two of ARIS' researchers received the Wawanesa Climate Champions: Youth Innovation Grant! The impact is already underway and here's what the researchers had to say about their work:

"This research focuses on developing and validating a passive de-icing approach that uses polymer materials to encourage natural ice shedding on power lines. By eliminating the need for external energy, the project supports more reliable and resilient power systems in cold-climate environments. We're excited to be contributing to the future of cold-region infrastructure"

— **Tamara Stojic, Research Assistant, CIRAMM**



"I'm excited to work on this project, which explores a multi-technology approach to mapping current levels of sediment accumulation and maximum holding capacity of stormwater ponds, all with the use of drones and sensors. This data driven approach is essential to protect communities at risk of flooding and ensuring stormwater ponds remain an effective solution in urban systems,"

— **Christian Sprinkhuysen, Research Assistant, CIRUS**

TURNING WASTE-TO-VALUE

Managing paraffin-rich tank sludge

Through our partnership with Avatar Innovations, an energy-focused venture platform that supports breakthrough technologies and innovations, RePhase collaborated with ARIS to address one of the industry's most pressing challenges: paraffin-rich tank sludge.

Composed of residual hydrocarbons, resins, asphaltenes and inorganic impurities, this sludge is traditionally expensive and difficult to manage, often ending up in landfills and increasing both operational costs and environmental concerns.

RePhase recognized an untapped potential: what if, instead of a disposal solution, what was truly there was a resource opportunity.



Where do we come in?

Believing in this vision, CERCUTS stepped in to isolate paraffin wax from oil sludge using solvent-based extraction and controlled thermal treatment. The research evaluated key process stages: extraction, separation and purification and utilized different solvent types, ratios, temperature and processing conditions.

ARIS researchers identified cooling conditions and mixing strategies as critical factors for the crystallization and recovery of the material, while successfully proving the technical feasibility of recovering paraffin wax from petroleum sludge.

What does this mean?

The result was a technical breakthrough that shows the successful recovery of paraffin wax. This scalable waste-to-value technology fosters a circular economy by sourcing a high-value material and reducing reliance on landfill disposal. Looking ahead, the recovered wax could be refined into phase change materials, substances that absorb or release large amounts of energy during phase transitions, for applications in energy efficiency and thermal storage.

The project's impact was recognized at the Avatar Innovations Demo Day, with the RePhase team earning the Best Pitch Award.

ARIS continues to advance technologies for waste reduction, material recovery and energy efficiency to strengthen our role in bringing solutions to Alberta's most prominent industries.

THE DOCUMENTERS CANADA

Engaging citizens and increasing access to civic information

Documenters Canada is redefining how Canadians access essential information. The initiative trains and pays community members to document public meetings relevant to their communities. These notes are fact-checked and published publicly to help residents easily understand local decisions that affect their lives. The Social Sciences and Humanities Research Council (SSHRC) funded project expands the Documenters model across three Canadian sites: Toronto, Montréal and Crowsnest Pass, Alberta.

Tyler Nagel, instructor at SAIT's School of Advanced Digital Technology and Western Canada network lead for Documenters Canada, is applying his rural journalism expertise to the Documenters model in Western Canadian and rural community contexts, creating a significant impact by adapting critical information in places where limited newsroom capacity can often leave important public meetings under-documented.

Crownest Pass Implementation

The Crowsnest Pass site is a high-profile rural implementation of the project and the first location in Alberta.

Led locally by the Crowsnest Pass Herald and in partnership with SAIT, the site connects civic documentation, journalism education, applied research and community engagement. Tyler initiated the Crowsnest Pass with Herald publisher Lisa Sygutek with support from Elise Stolte of CBC and research assistant Sarah B. Groot. The team developed a field guide that supports the training process. An initial cohort of community members were trained at the Crowsnest Pass Library before beginning to document local public meetings.

Applied research at SAIT is supporting community-engaged journalism while contributing practical tools for rural civic information access and strengthening Canada's role in advancing social sciences.

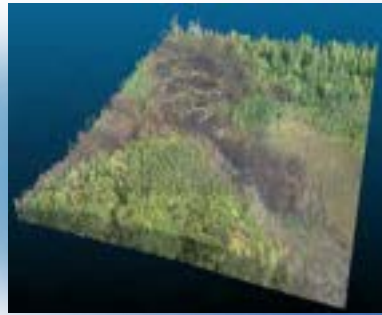


DRONE-SUPPORTED WILDFIRE OPERATIONS

Mitigation, response and management

“Wildfires have long been a part of Canada’s natural landscape, but the scale and impact have increased. Fire seasons are becoming less predictable, placing added pressure on responders, particularly in remote and hazardous environments where access, visibility and safety are limited.”

— Wade Hawkins, Research Chair, CIRUS



Through a collaboration with Alberta Forestry and Parks Wildfire Management Branch and the Northern Alberta Institute of Technology (NAIT) Centre for Data Management and Visualizations, CIRUS has advanced the development and evaluation of Remotely Piloted Aircraft Systems (RPAS) to support wildfire preparedness, response and recovery operations, enabling safer and more effective wildfire operations.

CIRUS evaluated advanced drone operations, including beyond visual line-of-sight operations, night and low-visibility flying, advanced sensor integration, real-time intelligence gathering and wildfire monitoring applications. The team also leveraged visual LiDAR and multispectral mapping to generate high-resolution 3D models that supported operational planning, hazard tree assessments and the delivery of medical and tactical supplies.

Through collaborative applied research, we are developing practical solutions, training highly qualified personnel and establishing the operational frameworks needed to strengthen communities, environmental stewardship, resilient transportation and emergency management systems.

Climate Simulation and Weathering Chamber

Sprung Instant Structures Ltd. (Sprung) approached GBTAC to assess a modified wall assembly incorporating an acoustic damping membrane, intended for installation on the interior side of the wall. The membrane improves acoustics but raised concerns about potential condensation within the assembly due to its porous nature.

The research team took on the challenge with the newly commissioned Climate Simulation and Weathering Chamber, developed with multiple partners, to address a gap where no standardized testing methods existed. GBTAC designed and implemented the testing protocol, monitored environmental conditions and assessed condensation performance.

The chamber is a unique, full-scale testing system that recreates real-world environmental conditions to evaluate the performance of building materials. From moisture and temperature simulation to solar UV exposure, the chamber enables builders to test materials without having to plan or wait for the needed environmental condition.

-40°C to +30°C Temperature range

**64 sq-ft.
test-area**

20 L per minute of water exposure

60+ minutes test duration

11 UV Index exposure

**1000 Pa pressure differential
across sample**

ENVIRONMENTAL DNA

Protecting Alberta's ecosystems

Enhancing SAIT's new environmental DNA (eDNA) research lab, Dr. Collin Pattison, researcher and instructor at SAIT's MacPhail School of Energy, is applying advanced environmental monitoring technologies to address real-world ecological challenges.

The development of eDNA methods and integrated biodiversity monitoring approaches supports the efficient detection of invasive species, conservation monitoring and environmental decision-making. Various eDNA collection methods have been explored, including water and air sampling – and collection using pre-existing spider webs. These sampling methods are more passive, allowing the team to explore biodiversity without actively waiting or disturbing wildlife. With the growing threat of invasive species in Alberta, this research is pivotal in ensuring the province remains equipped to identify, manage and respond to emerging ecological challenges before they become widespread.

The Exploring Biodiversity Through eDNA: Students Investigating Our Local Ecosystems project occurs every semester and allows students to engage in all phases of the research process, including study design, field sampling, laboratory analysis, data interpretation and dissemination. To date, this project has successfully detected secretive amphibians, including toads, frogs and salamanders, which are often difficult to find, as well as one terrestrial invasive species and two aquatic invasive species, whirling disease and crayfish. These findings contribute to real-world environmental monitoring and conservation efforts while providing students with hands-on technical and applied research skills.

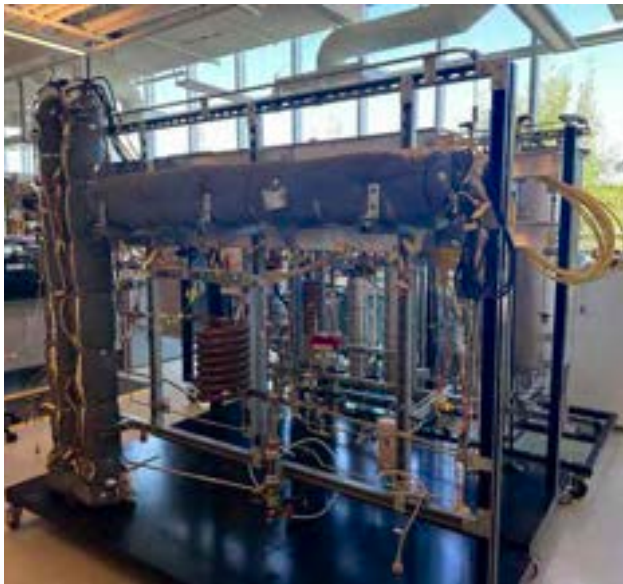
This research has been supported by an anonymous donor, SAIT's Innovative Student Project Fund (ISPF) and the Cisco Catalyst Chair Award, an annual initiative from SAIT and Cisco Systems that supports research and innovation at SAIT while recognizing teaching excellence through technological innovation.



ADVANCING ENERGY SOLUTIONS

Expanding OTSG operations

In fall 2025, CERCUTS expanded its Once Through Steam Generator (OTSG) operations into SAIT's newest facility, the Imperial Energy Innovation Centre. OTSGs use recycled boiler feed water to generate steam at high temperature and pressure, reducing the need for fresh water to separate bitumen. The move into the 40,000 square-foot facility doubled OTSG's run capacity, allowing the team to respond more efficiently to industry demand.



"This expansion was essential to ensuring we could meet the evolving needs of industry. Increased run capacity allows us to conduct research at a larger scale, creating more opportunities to generate new insights and advance our understanding of complex challenges. This has strengthened our ability to address the many challenges faced by industry every day."

— Marlon Norona, Principal Investigator (OTSG), CERCUTS

REDUCING THE NOISE

Turning down the volume on noise pollution by up to 92%

Due to long-wavelength sound's ability to travel through, around and over sound walls, low-frequency industrial noise is often difficult to reduce using conventional passive barriers. Through a collaboration with ZeroSound, ARIS' independent researchers supported the development of an active noise control (ANC) technology that cancels sound waves using digital noise-cancellation panels while automatically collecting environmental data to optimize noise reduction in real-time.

ARIS' independent researchers focused on designing and developing ZeroSound's sensing and sound-generation hardware, including the suppression speaker, outdoor directional microphones and the signal-processing hardware. As critical components of the ANC system, the microphones sense the incoming industrial noise, while the suppression speaker generates the phase-controlled anti-noise signal required to reduce it.

Providing research expertise and access to specialized infrastructure throughout testing and refinement played a key role in advancing the research project from concept to market-ready solutions for urban infrastructure – supporting quieter, healthier environments for residents and communities affected by persistent low-frequency industrial noise.

With additional funding awarded, future research will investigate upgrades to the ZeroSound speaker systems and the development of a new active sound-wall solution that integrates ZeroSound's ANC technology with existing passive noise barriers.

Thank you to the Natural Sciences and Engineering Research Council of Canada (NSERC) and Alberta Innovates for supporting this research.

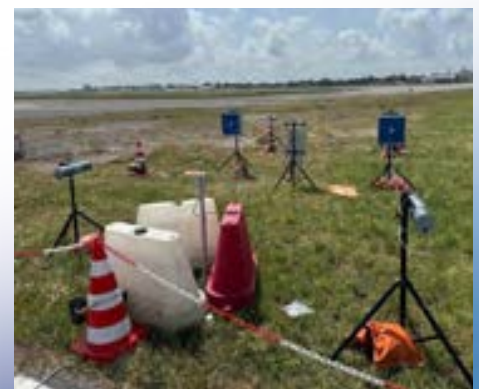
The collaboration advanced ZeroSound's technology from prototype development toward commercial deployment in multiple international markets:



**Commercial deployment
for Transelec in Chile**



**Commercial deployment
for ProFrac in the United
States**



**Proof-of-concept testing
at Rome Ciampino Airport,
Italy**



THE FUTURE OF AEROSPACE AND DEFENCE

Responding to Canada's evolving needs

Aerospace and defence are redefining global security. Innovation is now a core pillar for the national Defence Industrial Strategy and CIRAMM is driving that momentum with cutting-edge infrastructure.

The Alberta Aerospace Research Centre (AARC) is advancing lightweight, high-performance materials for aeronautical applications. We focus on discovery and development – from ballistic and resistance to impact durability – while researching the most essential characteristics of national security. Additionally, CIRAMM is one of only 13 Canadian NATO Defence Innovation Accelerator for the North Atlantic (DIANA) testing sites, helping global partners solve critical defence challenges.

AARC achieves this mission through an integrated ecosystem of five state-of-the-art research labs. The Advanced Materials Characterization Lab focuses on the mechanical properties of materials and is currently finalizing ISO 17025, a recognized certification that ensures our test outcomes are accredited globally. In the Novel Materials Lab, we synthesize high-performance alloys and aerospace-grade composites, the Advanced Manufacturing Lab provides robot-assisted welding and the Intelligent Design and Additive Manufacturing Lab uses artificial intelligence-driven design techniques. All these facilities are digitally integrated by the Robotics and Automation Lab to increase productivity and precision.

In a recent project with aeroplane manufacturer, De Havilland, we successfully tested composite materials under various operational conditions. This closed-loop approach accelerates innovation by supporting the entire design, prototyping and synthesis process all through one hub.





Additionally, CIRUS remains focused on advancing applied research that responds to evolving needs across sectors. Many of CIRUS' applications are inherently dual-use, with a growing focus on defence capabilities that support national security and sovereignty.

At the NATO Allied Command Transformation's Digital Backbone eXperimentation (DiBaX) event, CIRUS demonstrated how emerging technologies can improve battlefield medicine by combining secure 5G communications, live remote medical telementoring, RPAS-based medical supply delivery, autonomous ground evacuation and connected clinical sensors. The demonstration was designed around contested and austere military environments where specialist medical expertise may be unavailable at the point of injury.

Part of this commitment to strengthening Canada's defence and security capabilities includes supporting innovation and collaboration in the North, where Arctic sovereignty and resilience remain national priorities. ARIS' continued engagement, including previously completed research projects in northern communities, reflects our commitment to supporting the Arctic. Through recent participation in the 2026 Kitikmeot Trade Show and the Arctic Summit, we connected with local businesses, community members and our partners to ensure our work aligns with local priorities and contributes to lasting value in the North.

These engagements are essential to understanding emerging needs and opportunities in the North, helping to inform innovation, support infrastructure development, strengthen community connections and foster the partnerships needed to support Arctic sovereignty and security. ARIS continues to discover leading-edge technologies that foster national safety and the well-being of people.

THE PAST YEAR WAS MARKED BY COLLABORATION, INNOVATION AND MEANINGFUL RESULTS.

We extend appreciation to our partners, community members and funders whose collaboration helped turn innovative ideas into real-world impact. These achievements reflect ARIS' commitment to advancing applied research that benefits communities around the world. As the future continues to evolve, so does the ARIS Hub – strengthening partnerships, fostering new collaborations and creating real-world solutions that help shape a better tomorrow.

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WHAT A YEAR — THANK YOU!

Connect with us and be part of the next chapter.

**SCAN TO
LEARN MORE**





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