RESEARCH THAT MATTERS

Empowering Solutions Through Innovation

2025 ARIS IMPACT REPORT Applied Research and Innovation Services



APPLIED RESEARCH AND INNOVATION SERVICES (ARIS) HUB

SAIT's Applied Research and Innovation Services (ARIS) is one of Canada's top applied-research hubs with more than 77,000 square feet of specialized research labs and facilities. Our full-time research staff provide services organizations need to take their products from concept to prototype to commercialization.

The ARIS research and innovation hub brings together researchers, innovators, industry, communities, entrepreneurs, institutions, and students to develop skills and collaborate on new ideas, technologies and products that impact economic and environmental advancements across Canada and the globe.

ARIS HUB

LAND ACKNOWLEDGEMENT

The ARIS Hub lab and office spaces 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.

ARIS HUB RESEARCH FOCUS AREAS

CERCUTS

Centre for Energy Research and Clean Unconventional Technology Solutions

Research Chair: Dr. Ehsan Aminfar

- Once-Through Steam Generation (OTSG) Lab
- Water and Wastewater Treatment
- Energy Storage Systems
- Hydrogen Technology
- Sustainable Energy Development Lab

CIRAMM

Centre for Innovation and Research in Advanced Manufacturing and Materials

Research Chair: Dr. Hamid Rajani

- Advanced Construction Materials
- Integration of AI with Manufacturing Systems
- Large-size Additive Manufacturing of Novel Materials
- Alloying Systems
- Architected Materials
- Advanced Composite Materials

GBTAC

Green Building Technology Access Centre

Research Chair: Melanie Ross

- Advanced Building and Material Science
- Energy Management Information Systems
- Environmental and Architectural Ecology
- Affordability and Carbon Impacts

CIRUS

Centre for Innovation and Research in Unmanned Systems

Research Chair: Wade Hawkins

- Remotely Piloted Aircraft Systems (RPAS) Payload Delivery
- Integration of RPAS & Sensors
- Heavy-Lift, High-Endurance BVLOS Testing & Operation
- GIS, RS, MI & AI Analytical Modelling
- Data Visualization through AR & VR
- RPAS Disaster Management, SAR, Wildfire & Reclamation

R

Independent Researchers

Research Chair: Dr. Robert Davies

- Emissions Detection and Quantification Using Unmanned Aerial Vehicles
- Electronics Design, Assembly, and Testing
- Control Systems
- Data Analytics

ARIS HUB: ACHIEVING STRATEGIC GOALS AND DRIVING IMPACT

I am delighted to share a significant milestone in our institution's journey toward innovation and excellence. SAIT's Applied Research and Innovation Services has successfully achieved the objectives set forth in its first strategic plan, "Research Than Matters", marking a pivotal moment in our commitment to applied research, industry-driven collaboration and community impact.

Over the past two years, the ARIS Hub has worked diligently to advance research excellence. By working across disciplines and cultivating meaningful partnerships, we've strengthened our capacity to address complex, real-world challenges. This approach has deepened our impact, driving innovation and generating knowledge that is practical, relevant and responsive to the needs of our communities. Key achievements include:

- successfully completed 50 research projects in areas critical to the growth of Alberta's and Canada's economies
- **strengthened partnerships** with government, increased collaboration with post-secondaries locally, inter-provincially, nationally and internationally, partnered with Indigenous Nations in Alberta and beyond, all leading to increased funding and collaborative opportunities
- established the first Alberta Corridor Technical Symposium, bringing together polytechnic institutions to showcase the excellent work conducted by applied research scientists in this province
- supported the development of new technologies, methodologies, and best practices that have directly benefited our partners and the economy
- increased the opportunities for student involvement in research, equipping them with hands-on experience and career-ready skills.



These accomplishments are a testament to the dedication and expertise of our researchers, faculty, and students whose passion for advancing and applying solutions continues to drive our institution forward. I extend my heartfelt gratitude to all those who contributed to this success, from our Research Chairs to the technical lab staff who ensure the seamless execution of projects.

In 2025, our Applied Research and Innovation Services Department celebrates its 20th anniversary, marking two decades of innovation and collaboration. We are committed to developing practical solutions to address real-world challenges. The new 2025-28 ARIS Hub strategic research plan will focus on further strengthening our research capacity, expanding industry engagement, and leveraging emerging technologies to drive innovation.

Congratulations to the ARIS team for their outstanding achievement. Your dedication exemplifies our institution's mission to create knowledge that transforms the innovation ecosystem and the educational experience of our students through applied research opportunities that matter.

Mark Butler

Vice President, Corporate Development, Applied Research and International

MAKING IMPACT BUILDING MOMENTUM

Dear Colleagues and Partners,

2025 marks 20 years of ARIS — and we're just getting started. As Director of Applied Research and Innovation Services at SAIT, I am proud to share the incredible progress we have made over the past two years. Our vision is to be Canada's top applied research and innovation hub, and we are well on our way. Being ranked fourth among Canada's top research colleges in 2024 by Research Infosource is a testament to our collective efforts and dedication.

Our ARIS Hub has grown to more than 90 talented individuals, reflecting our commitment to excellence, passion, innovation, integrity and community. These core values drive our decisions, priorities and interactions, creating a positive and dynamic research environment.

This Impact Report highlights our achievements since 2023, showcasing how our projects have fueled innovation, supported industry growth and strengthened research capabilities. Our work has provided cutting-edge solutions for industry partners, enriched learning experiences for SAIT students and faculty, and fostered valuable collaborations with community and academic groups.

These efforts have driven job creation, economic growth and the development of highly qualified personnel. As we move forward, we remain committed to delivering practical solutions through applied research, guided by an evolving strategic plan that will propel us toward even greater success.

A heartfelt thank you to the ARIS Leadership team for executing our strategy and to all ARIS Hub members for making it happen. Together, we are making an impact and building momentum.

Jamie McInnis

Director, Applied Research and Innovation Services

LIVING OUR CORE VALUES

Excellence

Our team consistently strives to exceed expectations, delivering high-quality results that make a real difference.

Passion

We are dedicated to our partners, communities and students, showing genuine care and enthusiasm in every aspect of our work.

Innovation

We embrace creative solutions and challenge traditional approaches to solve problems and seize opportunities.

Integrity

We uphold ethical standards, promote trust and make fair decisions, ensuring that our work is both credible and impactful.

Community

Our collaborative spirit supports, encourages and values everyone's contributions, facilitating shared learning and novel solutions.



FOCUSED EXECUTION: ACHIEVING OUR STRATEGIC OBJECTIVES



RESEARCH EXCELLENCE

Over the past two years, ARIS has driven change in energy efficiency and low-carbon technologies, enhancing affordability, reducing environmental impact and supporting Canada's emissions goals. Our research infrastructure bridges the innovation gap for industry partners, while scholar exchanges and joint research projects foster a strong and diverse research culture. By upholding rigorous standards in data collection, analysis and interpretation, we drive meaningful innovation that benefits society and industry. These efforts have established the ARIS Hub as a leader in applied research in Canada, delivering real-world solutions and shaping the future of innovation.



ELEVATE LIFE-LONG LEARNING ENGAGEMENT

We increased the visibility of the ARIS Hub's work internally at SAIT through newsletters and a strong presence across social media and institutional events, fostering connections across the institution. The launch of the Student Engagement Framework in June 2024 created opportunities for capstones, practicums, tours and mentorships. Additionally, we strengthened relationships with various SAIT schools, creating pathways for students to engage with applied research early in their studies, enriching our projects and cultivating a culture of innovation and learning.



EXPAND PARTNER

Over the past two years, ARIS successfully built and strengthened partnerships with industry, community and post-secondary institutions. Collaborations with government, local businesses and Indigenous Nations led to increased funding and created new opportunities. Our partnerships across Alberta and Canada fostered a culture of innovation and shared expertise, while the Alberta Corridor Technical Symposium highlighted our research capabilities and solidified our reputation as a trusted, unbiased research partner, driving progress across sectors.

😪 FACT

Kelsey Chegus P. Eng. won the Innovation Award at SAIT's seventh annual International Women's Day Celebration for her leadership, mentorship and dedication to breaking down barriers in engineering and research.



The ARIS Hub is advancing its reputation as a well-known name in Canada for applied research and innovation by expanding external visibility and knowledgesharing efforts. Our researchers have published in peer-reviewed journals, presented at national and international conferences, and led workshops to equip industry partners with the latest advancements. We have strengthened our digital presence through increased social media engagement, an expanded website including an international presence, and features in new forums such as the Innovation News Network.



ADVANCE INTERNAL CAPABILITIES AND COLLABORATION

Continuous improvement is at the core of our approach. Over the past year, we have enhanced efficiency and performance by adopting better tools, refining research data management practices and strengthening internal processes. New project management and CRM systems have streamlined workflows, improving coordination across teams. By fostering a culture of learning and collaboration, we are building a more agile and high-performing research environment.

Sector Se

We relaunched the Innovative Student Project Fund (ISPF) to support SAIT students in bringing their applied research ideas to life. So far, it's helped **26 students** across **seven innovative capstone projects**— and we're just getting started!



CANADA'S TOP 50 RESEARCH COLLEGES | CANADA'S INNOVATION LEADERS 2024:

Canada's Top 50 Research Colleges -SAIT is ranked 4th with research funding of \$17.479M

Research Funding - SAIT ranks 3rd with a 37.6% growth from FY2022 to FY2023

Research Intensity - SAIT is ranked 1st in research intensity per researcher, with \$198.6k per researcher, representing efficient research output relative to personnel

Industry Research

Funding- SAIT leads in this area, ranking 1st with \$9.472M in total contributions from industry, which makes up 54.2% of its total research income

ALBERTA CORRIDOR TECHNICAL SYMPOSIUM

BEHIND THE IMPACT

Launched in 2023 through a partnership between the Southern Alberta Institute of Technology (SAIT), Northern Alberta Institute of Technology (NAIT), and Red Deer Polytechnic (RDP), the Alberta Corridor Technical Symposium has quickly become a cornerstone event for showcasing cutting-edge, industry-driven research from Alberta's leading polytechnic institutions.



Aksharesh Parmar

After a successful inaugural event at SAIT in 2023 — attended by representatives from government, funding agencies, industry, communities, polytechnic institutions — the momentum continued with an impactful event at NAIT in 2024. That year, three more institutions — Olds College, Northwestern Polytechnic and Lethbridge Polytechnic — were invited to join the collaboration. We're excited to continue this growing tradition of innovation and knowledge-sharing at RDP in 2025.

This one-day symposium brings together industry leaders, researchers, students and community partners to explore transformative projects that are driving Alberta's growth and prosperity. The event provides a unique platform for networking, exchanging ideas and experiencing the transformative impact of applied research. This collaborative knowledge mobilization initiative also demonstrates how Alberta's polytechnics are taking a leadership role in applied research and innovation by working together to solve real-world challenges and drive progress.



OUTCOMES THAT INSPIRE

The Alberta Corridor Technical Symposium has made a lasting impact on participants and the wider research community. Presenters and attendees shared in the excitement of discovering new ideas and making connections that are shaping the future of Alberta's applied research.

We extend our deepest appreciation to all participants, sponsors and institutional partners who make this event possible. Your support strengthens Alberta's research and development ecosystem, ensuring we remain at the forefront of innovation. We are excited to build on this success and continue inspiring the next generation of industry leaders and researchers across Alberta.



28 presentations of applied research impacts

GROWING ACADEMIC PARTNERSHIPS

- SAIT is the Southern Alberta Hub for the national College-University Lab to Market Network for Entrepreneurship and Research Commercialization. Led by Red River College Polytech, this network of post-secondary institutions and collaborative partners aims to turn academic research into real-world solutions, support Indigenous businesses and drive economic growth.
- SAIT and Technological University of the Shannon (TUS) have formed a partnership, where ARIS and the TUS Research Institutes will take a coordinated approach to applied research in their respective areas of expertise and interest.
- The **P2INACLE network**, which includes Northern Alberta Institute of Technology (NAIT), Northwestern Polytechnic, Red Deer Polytechnic, Red River College Polytech, Saskatchewan Polytechnic and SAIT, aims to drive economic growth and diversification through collaborative applied research partnerships of the Western Canadian polytechnics.
- The Canadian Unmanned and Remote Sensing Innovation Network (CURSIN) leverages expertise of college researchers and faculty, students and state-of-the-art equipment and software to test new use cases. The network aims to reduce barriers to adopting emerging technologies in unmanned and remote sensing. CURSIN members includes SAIT, Saskatchewan Polytechnic and Mohawk College.



POWERING REAL-TIME RESOURCE MONITORING THROUGH COLLABORATIVE APPLIED RESEARCH

BEHIND THE IMPACT

The energy sector is under growing pressure to reduce emissions, cut costs, and enhance production efficiency — particularly in remote or mature oilfields. In response, ARIS's Centre for Innovation and Research in Advanced Manufacturing and Materials (CIRAMM) and the Independent Researchers (IR) group partnered with Impossible Sensing Energy to support their FLOW technology, a compact, real-time multiphase flow meter for field-based monitoring of oil, gas and water without separation.

CIRAMM researchers contributed advanced fabrication and materials expertise to support the design of the meter's robust, field-deployable sensor housing and structural components, and the IR team led the specialized electronics design, developing a rugged, high-speed optical sensing and edge computing platform. This integrated solution enables FLOW to capture and process real-time data at the wellhead — minimizing downtime, increasing accuracy and eliminating the need for costly test separators.

OUTCOMES THAT INSPIRE

FLOW offers a transformative step forward in emissions reduction and production optimization. With scalable design, lower cost, and precision analytics, it is well-positioned to support cleaner, more efficient oilfield operations in Canada and beyond.

By combining CIRAMM's materials and prototyping capabilities with IR's expertise in electronics and sensing systems, this project demonstrates the strength of interdisciplinary applied research in delivering impactful, industry-ready innovations.



INDIGENOUS COMMUNITY COLLABORATION

BEHIND THE IMPACT

Indigenous ways of knowing and being, including Indigenous approaches to applied research, are essential to tackling today's complex challenges.

SAIT works closely with Indigenous communities in supporting learners and seeking beneficial applied research outcomes. Addressing challenges in remote areas requires a thoughtful, collaborative approach that balances potential positive impacts of technological innovation with risk management.

Over the past year, the ARIS Hub has actively collaborated on 13 applied research projects with Indigenousowned businesses, non-profits and Indigenous communities across Alberta and Nunavut, including Treaty areas 6,7 and 8. These projects span multiple technological impact areas, contributing to solutions in energy, building performance, health and safety and remotely piloted aircraft systems.

OUTCOMES THAT INSPIRE

The ARIS Hub has made significant strides in building capacity for meaningful collaboration with Indigenous partners. Researchers have completed 4 Seasons of Reconciliation Training and OCAP® training to strengthen data management practices that respect Indigenous data sovereignty.

Beyond research, ARIS has supported Indigenous youth by mentoring and supporting capstone projects by and focused on Indigenous collaborators, hiring Indigenous youth and students for two positions, and facilitating sessions at a science cultural camp for junior and senior high school students.

The ARIS Hub has supported the SAIT Office of Indigenous Engagement and the Truth and Reconciliation Vision Team, reinforcing its commitment to reconciliation through meaningful action. Calls to Action # 6, 18-24, 63, 75, 76, 80, and 92 are important to our work, and we are committed to ongoing growth and learning, recognizing that Indigenous and non-Indigenous people share responsibility for the path forward as Treaty people.





PATHWAYS ALLIANCE PROJECT

Centre for Energy Research and Clean Unconventional Technology Solutions has deepened its collaboration with Pathways Alliance, a coalition of Canada's largest oil sands producers committed to advancing the industry's environmental innovation. Since 2015, the partnership has driven research in Once Through Steam Generation (OTSG) systems and science, leading to upgraded test rigs, a novel OTSG design focused on erosion and corrosion science and improved industrial operations. Recent projects address mineral scaling, organic fouling and water additive effectiveness to increase OTSG performance. With ongoing support from Pathways Alliance, Alberta Innovates, NSERC, and Alberta universities, this research is shaping innovative solutions that enhance operational performance and reliability in Canada's energy economy.

CARBON MANAGEMENT CANADA COLLABORATION

Since 2019, SAIT has partnered with Carbon Management Canada (CMC) at its Field Research Station near Brooks, Alberta, serving as advisors, customers and collaborators. CMC recently invested millions in an automated, controlled methane release system — the Atmospheric Fugitive Emissions Test Facility designed to attract international clients and support accurate, reliable calibration of their technologies in a commercial environment. Under a service contract with CMC, ARIS Independent Researcher Rob Davies led the commissioning and operation of the test facility, advancing efforts to reduce methane and greenhouse gas emissions through innovation and collaboration.

"Rob Davies has supported Carbon Management Canada with the commissioning and operation of our newly-opened Atmospheric Fugitive Emissions test facility. With his background and hands-on experience with emission detection technologies and their deployment in the field, he has become a major contributor as we navigate through the early phases of the operation."

- Michelle Unsworth, Senior Project Manager, Carbon Management Canada







ARROWHEAD ABANDONMENTS COLLABORATION

"Arrowhead Abandonments is excited to continue collaborating with the ARIS team on cutting-edge research, particularly in the areas of clean water accessibility, hydrogen production, and resource autonomy for First Nations communities. We fully support SAIT's ongoing efforts, including the Applied Research and Development project led by Dr. Ehsan Aminfar, and we look forward to furthering innovations that will benefit our industry and the communities we serve. We highly recommend ARIS to any organization looking to integrate leading-edge research into practical, real-world applications."

- Kevin Heck, CEO, Arrowhead Abandonments

FACT: Arrowhead Abandonments completed Canada's largest wellsite reclamation project across several First Nations and Settlements.



SWISSDRONES COLLABORATION

"SAIT and SwissDrones are driving innovation through joint R&D projects and advanced training programs for Canadian companies. We are honored to collaborate with SAIT to share unmanned aviation technology's future and foster the next generation of RPAS advancements.

Crossing the 50-drone production mark is a milestone, but every handover tells a story — one of teamwork, dedication and cutting-edge technology making a real-world impact. A huge thank you to the entire SAIT team for being part of this journey. Here's to many more!"

- SwissDrones

FACT: SAIT owned the first SwissDrone in North America.

ZEROSOUND COLLABORATION

"At ZeroSound, we are revolutionizing the field of noise suppression with our patented active noise control technology. Our partnership with SAIT's ARIS Hub has been instrumental in refining this breakthrough technology, which reduces noise by up to 92%. Dr. Bob Davies and the ARIS team have provided invaluable expertise and resources, significantly accelerating our journey from concept to market-ready solutions. As we expand to meet global noise pollution demands, we are grateful for their ongoing support and look forward to continued collaboration."

- Norm Bogner, CEO & Co-founder, ZeroSound Systems Inc.

FACT: Now commercialized, this technology is in use at a Chilean electric power station and the Port of Montreal.

REMOTE REACT - DRONE DELIVERY POINT-OF-CARE TESTING AND TREATMENT PROJECT

BEHIND THE IMPACT

Access to emergency healthcare in remote and Indigenous communities is often delayed due to geographic and logistical challenges. The Remote React project is transforming emergency response by integrating drones, real-time data streaming and telementoring to deliver critical medical care when and where it's needed most.

Through cross-sector collaboration, this initiative leverages advanced drone technology and point-of-care testing to enhance emergency management. One of the key developments, the "Start the Breathe" kit, provides life-saving medical interventions, including treatment for pneumothorax (collapsed lung), delivered swiftly to isolated locations.



OUTCOMES THAT INSPIRE

The project has already made significant strides in improving emergency response and healthcare delivery. By successfully deploying drones linked to Emergency Operations Centres (EOCs), the team is enabling real-time situational assessments before first responders arrive, enhancing response times and overall effectiveness.

Trials for drone deliveries of medical supplies to remote communities have proven the feasibility of rapid response, providing a reliable method of support in critical situations. These early successes demonstrate the potential of technology to bridge gaps in healthcare access. Successes included:

- Delivered personal protective equipment (PPE) containing face masks/shields, gloves and gowns to Stoney Nakoda Nation and remote access sites.
- Delivered and tele-mentored a untrained volunteer to unpack the payload and guided the volunteer through successful treatment of the Stop Bleed Kit contents (gauze, clamp and tourniquet). This simulated treatment for a deadly bleed.
- Delivered and tele-mentored a untrained volunteer to unpack the payload contents and guided the volunteer through a successful ultrasound examination of all the relevant anatomic areas for patients with suspected COVID-19.
- Delivered the Start-the-Breathe medical payload kit and provided tele-mentored communication to enable a patient to self-diagnose and self-treat a pneumothorax (collapsed lung). The patient self-administered Bluetooth-enabled devices, including a pulse oximeter (O2 saturation), a spirometer (breathing rate) and a blood pressure cuff, and performed an ultrasound scan of the lung. All data was streamed in real-time to the physician, who determined the patient was suffering from a collapsed lung. At that point, the patient performed a chest tube intubation through tele-mentor support.

The project's impact is expanding globally, with advancements showcased at national and international events, including the Care in the Air Symposium at the Temerty Faculty of Medicine at the University of Toronto and the International Forum on Rescue in Difficult Environment in Genoa, Italy. These platforms have helped strengthen partnerships, attract new opportunities and further scale the technology.

By integrating innovative technology with healthcare, Remote React is not only advancing emergency response but also saving lives. With continued research, growing partnerships and student involvement, this project is shaping the future of accessible, rapid and resilient healthcare delivery in underserved regions.

Start-the-Breathe: Using Drones to Deliver Immediate Care At-the-Scene for Respiratory Distress in Remote Settings





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🕑 FACT

Stephanie Lapointe, Operational Lead at CIRUS won the 2024 Staff Innovation Award – Trailblazer at the SAIT Star Awards.

See related Publications:

- Flemons, Kristin, and Barry Baylis, Aurang Zeb Khan, Andrew W. Kirkpatrick, Ken Whitehead, Shahab Moeini, Allister Schreiber, Stephanie Lapointe, Sara Ashoori, Mishal Arif, Byron Berenger, John Conly, Wade Hawkins. "The Use of Drones for the Delivery of Diagnostic Test Kits and Medical Supplies to Remote First Nations Communities During Covid-19." *American Journal of Infection Control*, vol. 50, no. 8, 2022, pp. 849-856.
- Kirkpatrick, Andrew W., and Jessica L. McKee, Shahab Moeini, John M. Conly, Irene W.Y. Ma, Barry Baylis, Wade Hawkins. "Pioneering Remotely Piloted Aerial Systems (Drone) Delivery of a Remotely Telementored Ultrasound Capability for Self-Diagnosis and Assessment of Vulnerable Populations - the Sky is the Limit." *Journal of Digital Imaging*, vol. 34, 2021, pp. 841-845.

Kirkpatrick, Andrew W., and Jessica L. McKee, John M. Conly, Kristin Flemons, Wade Hawkins. "Smarter, Faster, Just-In-Time Hemorrhage Control: A Pilot Evaluation of Remotely Piloted Aircraft System Delivered STOP-THE-BLEED Equipment with Just-In-Time Remote Telementored Deployment." *Heliyon*, vol. 9 no. 1, 2023, pp. e12985.

ENGAGEMENT WITH SCHOOLS:

- 55 capstone students and three practicum students over three years (School of Construction's Bachelor of Applied Technology Geographic Information Systems, School of Advanced Digital Technology
- Faculty engagement One each from School of Construction's Bachelor of Applied Technology Geographic Information Systems Program and School of Transportation.

PARTNERSHIPS:

 Centre for Innovation and Research in Unmanned systems has partnered with Stoney Nakoda Nation, Frog Lake First Nation, the TeleMentored Ultrasound Supported Medical Interventions (TMUSMI) Research Group and the University of Calgary's W21C Research and Innovation Centre

🕑 FACT

Sara Ashoori, Operational Lead at CIRUS won the 2024 Aerial Evolution Elevatus Award for Women in Drones.

KUUGALAAQ CULTURAL CAMPUS

BEHIND THE IMPACT

Kuugalaaq embodies the fusion of traditional Inuit knowledge with cutting-edge building practices, addressing the pressing challenge of constructing energy-efficient structures in extreme northern conditions. Over 36 months, Green Building Technology Access Centre led key research efforts, conducting a feasibility study and energy modeling to optimize design decisions. They also spearheaded a comprehensive community monitoring project, collecting data on building performance and energy efficiency across six community structures.

The project brought together local Elders from Cambridge Bay, with northern-based industry and southern research support to create a structure that incorporates passive solar design and highperformance materials. Construction training sessions were held in Calgary in May 2022, bringing together project partners and local industry representatives. These sessions emphasized knowledge sharing and capacity building, laying the groundwork for the structure's assembly. The workshops also facilitated the sharing of cultural practices and provided important social and environmental context for the project.

OUTCOMES THAT INSPIRE

This research provides insights into how Arctic buildings respond to harsh climates, directly informing future construction practices. By integrating Indigenous knowledge with modern technology, the project preserves cultural heritage while pioneering sustainable solutions for Arctic infrastructure. The impact of this work extends beyond a single structure, setting a precedent for resilient, energy-efficient buildings that will serve northern communities for generations to come.

See related publication:

Griebel, Brendan, and Lillian Pas, Sophie Pantin, Emily Angulalik, Kim Crockatt, Melanie Ross, Kelsey Chegus, Leo Lu, Tyler Willson, Benjamin Hildebrandt, Amanda Robertson, Sandi Gillis and Tom Rutherdale. "Nunamiutuqaq (Building from the Land): Bridging Culture and Climate Sustainability through Architecture in the Canadian Arctic." *Journal of the Society for the Study of Architecture in Canada*, vol. 48, no. 1-2, 2023, pp. 22–37.



😪 FACT

GBTAC won **two awards from Tech-Access Canada** at the TAC Innovation Awards 2024 in Montreal in October for Best Inter-Institutional Collaboration and Triple Bottom-Line. The Triple Bottom-Line award was for Kuugalaaq Cultural Campus.





FROG LAKE FIRST NATION

BEHIND THE IMPACT

Wildfire Resilience Mapping will help ensure that community members and infrastructure are protected. Centre for Innovation and Research in Unmanned Systems worked with Frog Lake First Nation (FLFN) to establish a process for integrating remotely piloted aircraft technology (RPAS) to identify specific hazards in the forests surrounding the community. FLFN will use the project results, including data and insights from the studies, to support the development of hazard mitigation plans.

OUTCOMES THAT INSPIRE

CIRUS supported FLFN in securing RPAS infrastructure, certification and training. RPAS technology was demonstrated to FLFN community members and an RPAS pilot training seminar was offered.

CIRUS Pilots used RPAS equipped with a high-resolution visual camera, a multispectral sensor and a light detection and ranging (LiDAR) sensor to collect and process data. This included the development of a digital elevation model, digital surface model, orthophoto and tree species identification. The RPAS data was supplemented with historical FLFN data and satellite imagery.

The processed data was analyzed to support wildfire mapping for the Frog Lake First Nation community. This included the generation of a wildfire-predictive map to assess infrastructure vulnerability to wildfires, as well as the creation of emergency access routes in the event of a wildfire.

"Creator places opportunity for milestones on each path. Individuals and their meaningful relationships create meaningful milestones. In searching for like-minded kindred spirits with shared values and goals, Frog Lake First Nations found, in the Southern Alberta Institute of Technology: Applied Research & Innovation Services, the right partner to create those milestones and strengthen that foundational network. The three community research projects, 1) wildfire resiliency with drone technology, 2) Vanadium Redox Flow Battery Feasibility, and 3) Vertical Axis Wind Turbine Feasibility, became the basis of the partnership and has unlocked and inspired a generation of innovators in a First Nations community. Together, we are decarbonizing as we decolonize, reconciling our past — repatriating our present while restoring an abundant and prosperous future. The future is always forward."

- Cliffton Cross, Council Member, Frog Lake First Nations, Winner of the ASTech Award for Regional Innovation Champion – Vermillion Area

AVATAR INNOVATIONS COLLABORATION

BEHIND THE IMPACT

Bringing new energy technologies to market requires rigorous validation and industry support. Through the ARIS partnership with Avatar Innovations, an energy transition start-up accelerator, 10 start-up companies collaborated with ARIS from 2022 to 2024, gaining access to lab testing and expert guidance to refine their innovations and technologies.

"As our organization has expanded into multiple global markets, SAIT has been a valued partner from our very beginning. Their team, capabilities and understanding of rapidly evolving market dynamics have enabled us to cost-effectively deliver many new technologies. We look forward to continuing to work with SAIT on improving innovation success in Calgary."

-Kevin Krausert, CEO and Co-Founder, Avatar Innovations

OUTCOMES THAT INSPIRE

In partnership with Centre for Energy Research and Clean Unconventional Technology Solutions, Nanostrip — a 2024 start-up originally named Golden Bubble exceeded expectations with results demonstrating the potential for real-world application. NovaGen also gained valuable insights into their technology, laying the groundwork for further development. At Avatar Demo Day 2024, both teams showcased their results to investors, with NovaGen earning the Best Presentation Award, increasing visibility and momentum for their technology. This collaboration demonstrates how targeted support helps energy transition start-ups refine their solutions and attract the investment needed to drive industry change.



😪 FACT

Since its inception, Avatar Innovations has **incubated more than 170 potential industry solutions**. Of those, 30 have secured additional investment beyond the accelerator program and 12 have progressed to commercialization.



NATO DIANA

BEHIND THE IMPACT

As global security challenges grow more complex, advancing technological solutions has never been more critical. In 2024, SAIT's Centre for Innovation and Research in Advanced Manufacturing and Materials (CIRAMM) became one of only two NATO Defence Innovation Accelerator for the North Atlantic (DIANA) centres in Alberta and one of just 13 in Canada. This designation connects Alberta's innovators with NATO's global network, providing a platform to advance security-focused technologies.

With world-class research infrastructure, CIRAMM is now positioned to support industry and entrepreneurs in tackling some of the most pressing challenges in defense, cybersecurity and advanced manufacturing.

OUTCOMES THAT INSPIRE

This designation expands opportunities for Alberta's startups, researchers, and industry leaders to develop and test breakthrough security technologies. With access to specialized expertise and advanced facilities, innovators can accelerate solutions that enhance defense capabilities, strengthen critical infrastructure and improve global resilience. By fostering collaboration on an international scale, this initiative ensures Alberta plays a vital role in shaping the future of security and technology.



Section 2017

CIRAMM commissioned an aerospace-grade autoclave for the manufacturing of advanced aerospace materials. It is unique to Alberta, one of very few in Western Canada, uncommon in Alberta's research and innovation ecosystem, and distinguished by its large size and being aerospace grade.



HOW ARIS SUPPORTS THE ECONOMY AND JOBS:

ARIS drives economic growth by helping businesses innovate, create jobs and train the future workforce. Through applied research, we turn ideas into real solutions, secure funding to support industry advancements and help communities take the first step toward change. Everything we do supports industry and community driven innovation and economic progress. By constantly working toward these goals, we strengthen industries, equip students with in-demand skills, and contribute to a stronger, more resilient economy.

FACT: In the past year, ARIS Hub has significantly expanded student engagement through applied research and experiential learning opportunities. Practicum Placements: engagement grew by 53%, enabling students to gain valuable industry exposure.



TECHNOLOGY ACCESS CENTRE RENEWAL

For more than a decade, SAIT's Green Building Technology Access Centre has been a vital resource for businesses, providing hands-on research, training and innovation support to advance energy-efficient building practices. With its specialized facilities, GBTAC helps small companies develop and test solutions. Now in its third term with the Technology Access Centre program, GBTAC continues to provide essential funding, expertise and resources to help small companies scale, forge industry partnerships and drive applied research that makes a difference. By bridging knowledge gaps in the construction sector, GBTAC ensures communities have access to forward-thinking solutions, supporting Canada's long-term environmental and energy goals.



FUGITIVE GASSES DETECTION AND QUANTIFICATION

Since 2022, ARIS has advanced methane emissions measurement, building on drone-based detection research that began in 2018. In collaboration with organizations like Canadian Natural Resources Ltd. and Carbon Management Canada, ARIS has developed a comprehensive framework for detecting and quantifying fugitive gas emissions. By using drones and cutting-edge technology, industries can now better assess and reduce their environmental impact. This work supports commercial upstream facilities in managing emissions more effectively, while expanding applications to sectors like airport safety. The research's broad applicability helps leaders from across industries improve environmental performance and mitigate risks.

ENERGY EFFICIENCY RETROFITS FOR FRIENDSHIP CENTRES

The Green Building Technology Access Centre partnered with the Alberta Native Friendship Centres Association (ANFCA) to improve energy efficiency in Friendship Centres, creating optimized spaces while incorporating training and community engagement events such as building sustainability summits. Friendship Centres are vital hubs for urban Indigenous communities, providing essential services, cultural programming and social support. Building evaluations were conducted at 16 Friendship Centres, with four Centres undergoing detailed energy audits. Three Friendship Centres completed targeted energy efficiency upgrades, with a full year of emissions monitoring, and received support to become a demonstration hub. This project was undertaken with the financial support of the Government of Canada.

"Since 2021, ANFCA has collaborated with SAIT Green Building Technologies and four Friendship Centres in St. Paul, Medicine Hat, Fort McMurray, and Grande Prairie — to reduce carbon emissions, improve energy performance, and lower operating costs. The project has already achieved a greenhouse gas reduction of 20 tonnes annually, with ANFCA as a whole cutting an additional 35 tonnes of emissions per year. These savings allow Friendship Centres to redirect resources to vital community services, including housing, food security, health and employment programs."



- Joanne Mason, CEO, Alberta Native Friendship Centres Association

AEROSPACE COMPOSITE MATERIAL LAB

The Centre for Innovation and Research in Advanced Manufacturing and Materials' Aerospace Composite Manufacturing Lab (ACML) is poised to advance Calgary's position as a hub for aerospace innovation by strengthening local research, development, and manufacturing capabilities in composite materials. The lab aims to accelerate industry diversification, foster collaboration with aviation leaders, and contribute to a growing aerospace innovation ecosystem.

"The ACML will be a transformative resource for Canada's aerospace industry and is a testament to OCIF's role as a catalyst for economic diversification in Calgary," said Brad Parry, CEO of the Opportunity Calgary Investment Fund and president and CEO of Calgary Economic Development. "This investment adds one more piece of the puzzle that will help build an aerospace innovation ecosystem and position Calgary as a leader in the sector."

HOW ARIS IS SUPPORTING HIGHLY QUALIFIED PERSONNEL:

Every research project we undertake supports the development of Highly Qualified Personnel (HQP) by fostering knowledge exchange between researchers, industry and community partners, and students. Our research teams gain hands-on experience solving real-world challenges, while industry and community collaborators benefit from insights and innovative solutions. At the same time, students actively participate in applied research, equipping them with valuable skills and connections that often lead to future employment opportunities. Through this collaborative approach, we strengthen expertise across sectors and drive meaningful innovation.



REMOTELY PILOTED AVIATION TRAINING CENTRE

The newly completed Remotely Piloted Aviation Training Centre is a state-of-the-art facility designed to meet the growing demand for skilled professionals in remotely piloted aircraft systems (RPAS). Equipped with an immersive learning managing system, advanced simulation studios, VR/AR technology, mobile command centers and sophisticated RPAS, the Centre provides hands-on training in RPAS operations, mission planning, mapping, maintenance and flight for systems over 25 kg. It also supports certification and ongoing research to advance the RPAS sector. In collaboration with SAIT's Continuing Education program, the Centre plans to offer custom micro-credential courses, directly addressing workforce needs. This initiative will not only produce highly qualified personnel, but also drive economic growth, job creation, and innovation in Canada's rapidly expanding RPAS sector.



The Remotely Piloted Aviation Training Centre also has a strong collaboration with the School of Transportation, supporting student learning and engagement through collaboration on research projects, regulatory discussions, capstone opportunities and curriculum support.

FACT: ARIS Hub has engaged students from five of SAIT's seven schools, as well as those from Continuing Education, Academic Services and student clubs, broadening the reach and impact of our research.

PASSIVE SOLAR GREENHOUSE AT NORMANDEAU SCHOOL IN RED DEER, ALBERTA

Green Building Technology Access Centre partnered with the Red Deer Public School District, Scott Builders Inc., and ZS2 Technologies to research a low-energy, passive solar greenhouse with a 'climate battery' system at Normandeau School. Over two years, the project provided valuable insights into optimizing greenhouse designs for cold climates like Alberta. It also integrated environmental responsibility and STEM learning into the school curriculum, offering students hands-on experiences with cutting-edge science and gardening skills. This innovative project supports food and energy security while also enriching student education and fostering the next generation of environmentally-conscious leaders.





BEHIND EVERY STORY IS A PARTNERSHIP, A CHALLENGE, AND A SHARED VISION.

The last two years were filled with collaboration, innovation and results. These achievements reflect the momentum built through our 2023-2025 Strategic Research Plan, "Research the Matters", and the strength of our partnerships across sectors. And they are just the beginning. The ARIS Hub continues to evolve, advancing applied research, deepening connections and creating real-world solutions that shape a better future.

Connect with us and be part of the next chapter.

THANK YOU TO OUR PARTNERS, COLLABORATORS AND COMMUNITY FOR SHAPING THE FUTURE WITH US.

Let's connect and explore what we can achieve together.

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