
Queen's
UNIVERSITY
Strategic
Research
Plan
2025-2030

Land Acknowledgement and Commitment to Truth and Reconciliation

Queen's is situated on the territories of the Haudenosaunee and Anishinaabek peoples. We recognize the importance of research grounded in Indigenous ways of being and knowing which arises through reciprocal relationships with these lands, languages, peoples and all beings. We acknowledge our collective responsibility to nourish the land that sustains us and to follow the principles of care, sharing and cooperation, embodied in the Dish With One Spoon Covenant.

Yakwanastahentéha Aankenjigemi Extending the Rafters: Final Report of Queen's Truth and Reconciliation Commission Task Force provides the foundation from which Queen's commits to Truth and Reconciliation. This commitment is an ongoing effort and responsibility of all members of the Queen's research community through the period of this Strategic Research Plan and beyond. All members of the Queen's research community share a responsibility for creating respectful partnerships with First Nations, Métis and Inuit Peoples and to foreground the needs and ideas of Indigenous Peoples through co-creation, co-leadership and co-ownership in research. We are committed to supporting and advocating for the removal of barriers that affect the pursuit of community-based research questions, and strive for reforms to allow meaningful research that furthers reconciliation.

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Many images in this Strategic Research Plan are sourced from Queen's University Art of Research Photo Contest.

Cover Image: *More than Meets the Eye* by Donald Brien, Staff, Centre for Neuroscience Studies

IMAGINE

Our Foundations, Vision, Community, and Commitment

Building on strong foundations of research excellence, our vision is to create the conditions for transformational research at Queen's.

Our Foundations

Queen's history of discovery and innovation has shaped the foundations of knowledge in Canada and around the world. It is a more than 180-year legacy of which we are proud. As a leading research-intensive university, we have built synergies among researchers, communities, governments, and industry.

Our researchers are in the pursuit of knowledge creation across the humanities and social sciences, health and medicine, and natural sciences and engineering. They have received the world's most prestigious national and international awards – from the Nobel Prize in Physics (2015) to Orders of Canada and Ontario to election to the Royal Societies (UK and Canada). We are proudly home to Canada Excellence Research Chairs (CERCs) in strategic areas of experimental immunotherapy and cancer, nuclear materials, and astroparticle physics.

Our globally recognized research institutes investigate the mysteries of the universe and are at the forefront of materials science. Queen's also distinguishes itself internationally for its commitments to the United Nations' Sustainable Development Goals (UN SDGs), consistently ranking in the global top ten of the Times Higher Education Impact Rankings.

Within our local communities of Kingston and Eastern Ontario, Queen's contributes to economic and social productivity, innovation, and prosperity. Our research ecosystem generates ideas and talent and leverages state-of-the-art facilities to address challenges facing Canada. These ideas don't just remain inside of the university: Queen's has ~70 active technology license agreements at a given time, files 15–20 new patents each year, and supports ~80 startups on a regular basis.

Our Vision

While this foundation tells us that we are on the right track, our work is never done. Today's global problems are multifaceted and complex with new research frontiers to explore. Breakthroughs that solve problems and expand knowledge require us to collapse traditional silos, think creatively, and push boundaries.

In an increasingly competitive research funding and rankings environment – nationally and internationally – the status quo is no longer sufficient. We must position ourselves for investment and the growth of our ecosystem by readying our community for opportunities and expanding our global leadership in research excellence and impact.

This means welcoming more research-driven faculty and students from around the world, attracting new resources for our ambitious research goals, and enhancing our engagement with local, regional, and global partners in the research community, government, and industry. Our goal is to advance research and knowledge mobilization that is global and grounded in mutually beneficial partnerships.

We will continue to champion fundamental research and high-quality output, while supporting optimal environments for training new researchers and building alliances to advance mission-driven scholarship and innovation. We are also committed to sharing our research widely, while being mindful of shifting geopolitical landscapes and our obligations to safeguard our research when needed.

Our vision is to create the conditions for transformational research at Queen's.

"At Queen's, we approach society's most pressing problems with curiosity, creativity, and determination. Our researchers are exploring new ways to understand the world.

The Strategic Research Plan describes the areas where Queen's is uniquely positioned for national and international impact, and that require ongoing, focused effort to ensure our continued leadership. In championing an ecosystem that allows for agility and responsiveness, we create the conditions for new research strengths to emerge. We are committed to fostering a vibrant and diverse scholarly community, supporting every ambitious researcher in reaching their goals."

Dr. Nancy Ross
Vice-Principal Research

Our Community

Queen's strength is our people. Since 1841, the university's success and influence on the world have been fueled by the energy and commitment of its faculty, staff, and students. Uniting our community is a passion for research and scholarship – whether fundamental, applied, or community-based.

The Queen's research community comprises:

- Six academic faculties and schools
- Two affiliated teaching hospitals
- Over 850 faculty members
- Over 450 clinician scientists
- Thousands of research-driven undergraduates, graduate students, and postdoctoral researchers

Importantly, the Queen's research ecosystem is enriched by a diversity of perspectives. We recognize the interconnected paths of research and learning and their close relationships to identity. By incorporating diverse ways of knowing and being, we enhance our research community and scholarship through the lens and values of Indigenization – Equity, Diversity, Inclusion, Anti-Racism, and Accessibility (I-EDIAA). These perspectives shape the questions we ask and our understanding of the world around us.

Our Commitment

Through the period of this Strategic Research Plan, the Queen's community will be bold, take risks, and challenge assumptions as we aspire for an even greater impact of our research efforts.

To achieve this, we are committed to:

- Attracting more investment and new resources to support trainees and to achieve research impact
- Welcoming more research-driven faculty and students from around the world
- Supporting excellence in fundamental research
- Enriching our research community and scholarship through the lens and values of I-EDIAA
- Building meaningful partnerships through co-creation to advance reconciliation and the research priorities of Indigenous communities
- Enhancing engagement with partners in the community, government, industry, and across sectors
- Advancing mission-driven, interdisciplinary research
- Creating the optimal environments and supports for training new graduate students and postdoctoral researchers

Strategic Research Plan 2025-2030

The Strategic Research Plan presents an opportunity to articulate a vision for the advancement of our research community's ambitions.

This plan builds on the Queen's Strategy and the strategic pillar of Research Prominence through "increasing the intensity and volume of research." It also echoes our institutional commitments to the United Nations' Sustainable Development Goals, our values of equity and inclusion, and the aspirations outlined in the Global Engagement Strategic Plan.

ENGAGE

Research Themes

Queen's has six themes of strategic research focus. Built upon existing and emerging research strengths, these are areas in which we are uniquely positioned for impact and investment.

All six themes are interconnected. They transcend faculties and departments and are interdisciplinary by nature, as the world's most pressing challenges can rarely be addressed from a single perspective. Each theme also has connections to Queen's strategic priorities of advancing reconciliation with Indigenous peoples and to many UN SDGs.

THEME

Understanding the Earth and universe

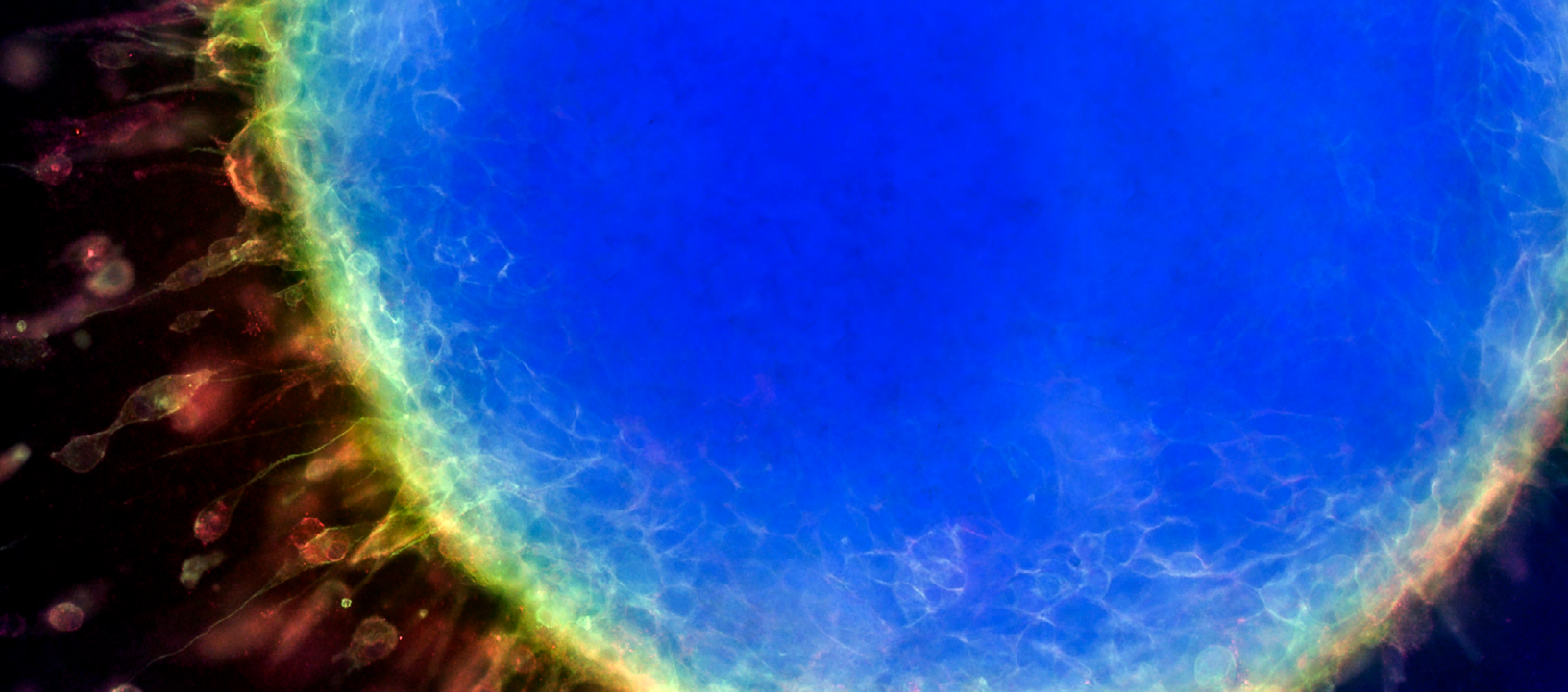
Human beings are curious and driven to explore, experiment, and discover. This curiosity-motivated work can help us to understand our place in the world and can lead, sometimes in unforeseen ways, to solutions to current and future global problems.

Researchers at Queen's discover and explore by developing mathematical models that describe physical phenomena, elucidating the nature of molecular and surface reactions, and investigating interactions between biological and social systems and the environment – particularly in light of climate and other human-driven changes. We study the composition, structure, and physical aspects of the Earth, including landscape and freshwater systems. We undertake foundational research in astroparticle physics, astronomy, and quantum photonics, and also advance scholarship on Indigenous and other diverse ways of knowing. These efforts collectively improve our understanding of the world around us and the laws and structure of the universe.

Photo at top of page: *Lithium Below, Stars Above* by Christopher Spencer, Faculty, Geology and Geological Sciences

Building on the Nobel-winning research on the properties of neutrinos, Queen's is positioned as an international leader in astroparticle physics and the hunt for dark matter through the Arthur B. McDonald Canadian Astroparticle Physics Research Institute (MI) and the major national research facility SNOLAB. The MI works for the entire Canadian astroparticle physics community in coordinating technological advances and positioning Canadian researchers to be at the forefront of breakthrough global-scale experiments. In 2024, the MI was awarded $45.5 million over five years in federal support.

Photo: SNO+ Dectector - *Window to a Window on the Universe* by Mark Chen, Faculty, Physics, Engineering Physics, and Astronomy



THEME

Promoting health and wellbeing and reducing the burden of disease

Queen's complement of discovery-based researchers, clinician scientists, nursing, and rehabilitation faculty are driving bench-to-bedside and community-based innovations that are improving patient care and outcomes. We are advancing understanding of cancer drivers and the design and conduct of clinical trials in cancer therapy and supportive care. These developments are improving cancer outcomes nationally and internationally.

Our researchers are also making inroads in other health-related fields – from epidemiological and public health research to transforming the understanding and treatment of blood and cardiovascular disorders and developing innovative medical technologies and devices. We are informing novel approaches to treating inflammation and pain and improving patient outcomes for chronic and infectious diseases. Using model systems, we are furthering our knowledge of brain function and disease and providing technology-driven, patient-centred solutions.

We are committed to tackling the broad and systemic health challenges of our time from an interdisciplinary perspective that encompasses prevention and the broader determinants of health. As health leaders regionally, nationally, and globally, we are working with and within communities to devise innovative and culturally sensitive approaches in support of lifelong physical, mental, and social wellbeing and healthy aging for all.

In 2024, the Cara and Murray Sinclair Cancer Research Institute (SCRI) received a $25 million landmark gift to establish state-of-the-art facilities, build capacity, and create training opportunities in cancer research. With a translational approach, SCRI is home to a Canada Excellence Research Chair and several Canada Research Chairs, advancing research from cancer biology and genetics to cancer care and epidemiology, as well as leading practice changing clinical trials through the internationally recognized Canadian Cancer Trials Group.

Photo: *Leaving Home* by Eric Lian, PhD Student, Pathology and Molecular Medicine

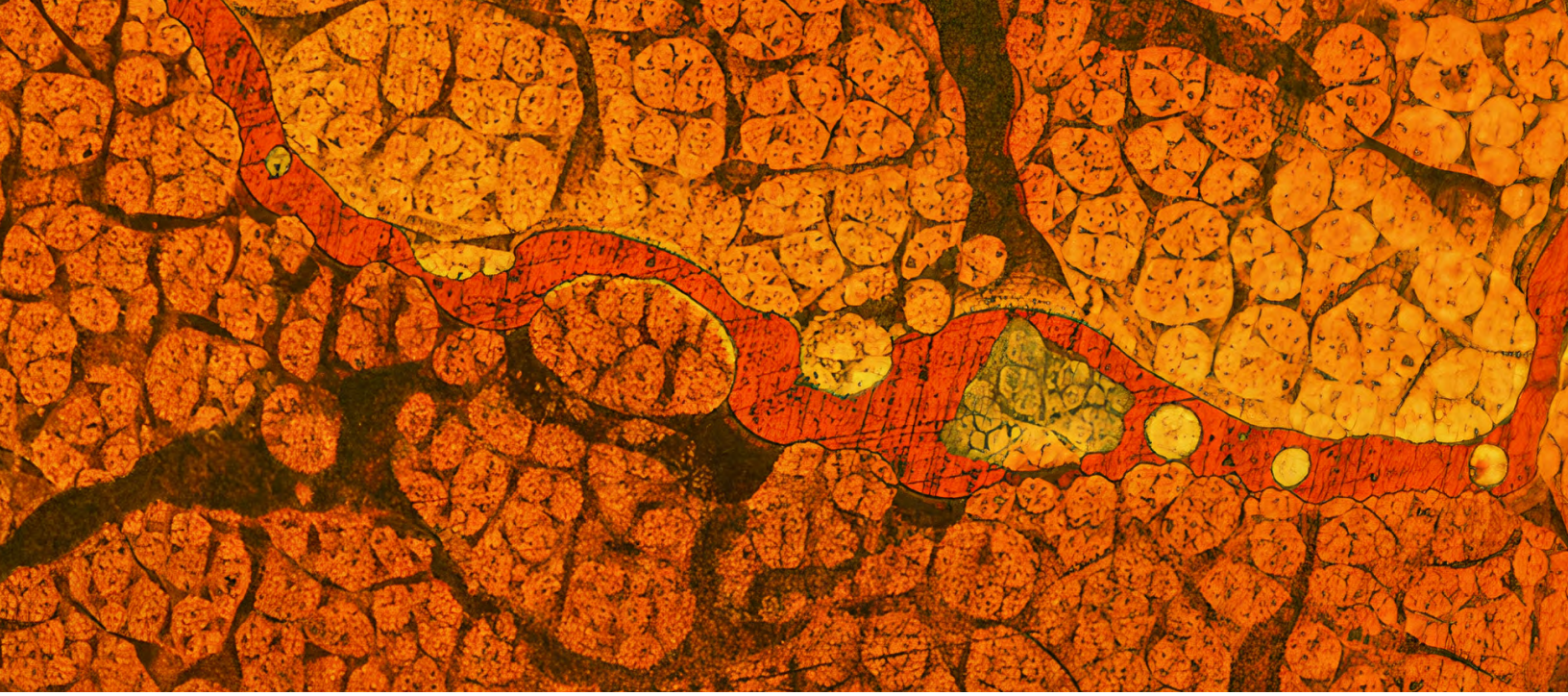
THEME

Envisioning just futures and innovating in cultural expression

Queen's research reflects on the questions of what it means to be human. Driven by historical inquiry into beliefs and experiences, languages, arts, and Indigenous rights, our researchers collaborate broadly to envision just futures. Our scholarship addresses racial, gender, and sexual politics, inequality, colonialism, Indigenous languages and cultures, political philosophy, the role and impact of media and technology, and how artistic creation and cultural diversity elevate human experience.

In our rapidly changing world, the interplay of religion, conflict, social polarization, and democratic integrity demands sustained and focused research to deepen our understanding and guide effective responses. We explore the relationship between ideals of democracy, justice, and the rule of law, and have an active collective of socially engaged researchers who are addressing important questions around fairness, human dignity, and social justice. We are committed to advancing our understanding of how human experience and cultural expression can deepen the impact of scientific and technological advances, contributing to the full spectrum of the UN SDGs and leading to human-centred, ethical, and inclusive solutions to a range of the world's challenges.

With a $100 million new facility currently under construction and a bold new vision, the Agnes Etherington Art Centre (AGNES) is positioned to play a sector-leading role in Canada's cultural future. Reimagined through a community-engaged design process, the new AGNES will advance social justice and decolonial museology and incubate artistic and research experimentation. It will host state-of-the-art facilities for research into the science and application of art conservation and heritage research, including advanced imaging technologies that bring together new ways of seeing below the surface of art and artifacts.



THEME

Delivering materials for the future

Advanced materials are essential in our everyday lives and our needs will only increase. Queen's researchers are exploring the potential of natural materials and the recyclability of synthetic ones, and developing innovative materials and coatings for diverse applications. These include infrastructure, energy production and storage, electric and computer technologies, automobiles, and replacement human tissues. Each application has unique design parameters that define the properties of the required materials, including corrosion resistance, environmental impact, stimuli responsivity, biocompatibility, strength, durability, processability, electric storage capacity, and many others.

Materials research integrates concepts from multiple disciplines – from engineering, chemistry, mathematics, and physics to medicine and biology. This work has broad impact and will generate new medical treatments, more durable and sustainable infrastructure, cleaner energy sources, and more efficient energy transport.

Home to a Canada Excellence Research Chair and a world-leading test facility, the Reactor Materials Testing Laboratory (RMTL), Queen's supports Canada's green energy transition with a focus on technological advances for small modular reactors, an essential component of energy solutions in many countries around the world.

Photo at top of page: *Copper Oxide Growth Patterns* by Jeffrey Wang, MASc Student, Mechanical and Materials Engineering

An innovative method to expand the lifespan of critical metals sparked the creation of the Carbon to Metal Coating Institute (C2MCI) at Queen's. Bolstered by a $24 million New Frontiers in Research Fund grant, the Institute hosts an interdisciplinary team working on fundamental research and developing applications that can save billions in infrastructure and manufacturing costs, as well as improve cancer care and medical imaging.

THEME

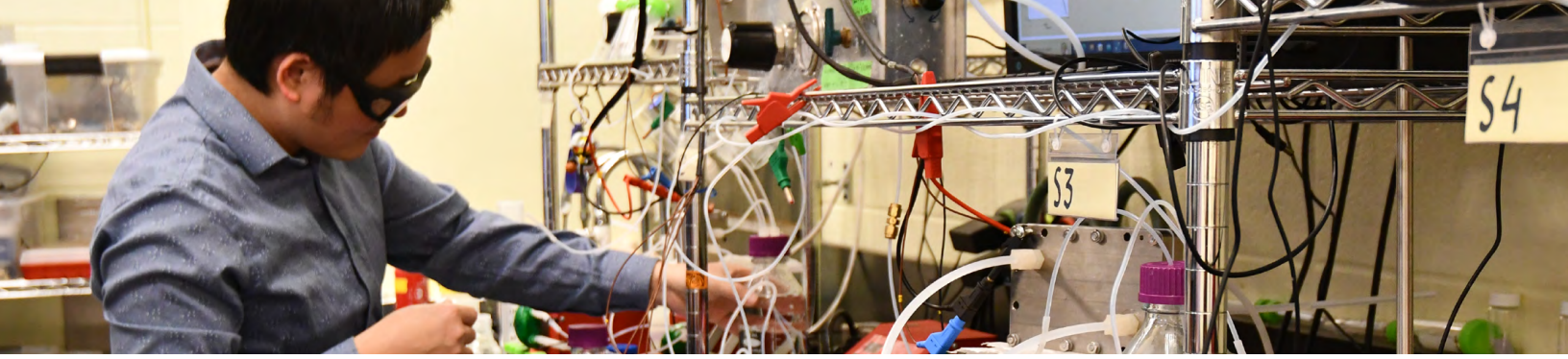
Advancing next-generation computing and analytics

Supercomputers are critical infrastructure supporting advances taking place across all research fields in Canada and around the world. They allow researchers to ask and address bigger, more complex questions. While Canada currently lacks the sovereign, secure supercomputing power to support its bold research and innovation goals, Queen's research is positioned to lead capacity building and infrastructure development that will increase Canada's competitiveness in supercomputing.

Our experts are also poised to advance research and knowledge mobilization in the fields of artificial intelligence (AI), machine learning, human-machine interactions, and robotics, as well as their applications across disciplines, including business innovation, health, and the digital humanities, with a necessary critical lens on matters of surveillance, equitable access to technological design and uses, and anti-racist citizenship. Queen's researchers are exploring econometric methods for causal machine learning and developing new algorithms to understand human behaviour and wellbeing based on data such as video, audio, and text.

AI, when used responsibly, holds the promise to revolutionize research in the upcoming decades, but only if we can transform raw data into actionable insights. We are committed to laying the foundation for research groups across Queen's to meaningfully engage with AI as they explore new applications, methodologies, and paradigms, while also thinking about its social, legal, privacy, and security implications.

Queen's momentum in AI research is strong – we are leading Canadian universities in growth in AI-based publications since 2018 (2024 Research Infosource Rankings – medical category of universities). With globally recognized expertise in building supercomputing infrastructure and capacity, our researchers support the academic community, governments, and industry in pursuing broader applications of artificial intelligence and machine learning. Queen's researchers are advancing ways to protect Canadians'digital privacy and guard institutions against cyberattacks.



THEME

Building productive, inclusive, and sustainable societies

The challenges of a changing climate and how humans get along with one another and share in prosperity are perhaps *the* interconnected trials of our time. Queen's researchers are at the forefront of these challenges, forecasting the environmental, health, and societal effects of climate change and developing technologies like low-emission energy solutions and strategies for mitigation and adaptation. We build evidence, institutions, and methods to support research-based policy and decision-making, creating a better future for people and the planet.

Queen's researchers are developing options for more environmentally responsible extraction of critical minerals and for carbon dioxide capture and transformation. We are geoengineering innovative approaches to climate-resilient infrastructure and protecting our water sources. Unique campus facilities enable research on issues from coastal flooding and natural hazards to contaminants of emerging concern. Our scholarship addresses the distinctive impacts of climate change in remote northern and Arctic locations, including permafrost thaw and associated effects on carbon emissions, housing, and food and water supply.

Queen's research offers economic, business, and legal solutions to support shared prosperity, while protecting the planet. We have expertise in governance, multi-cultural citizenship, peace building, and military affairs. Our researchers work collaboratively with the communities we ultimately serve, creating meaningful knowledge and applications. This includes developing adaptive technologies to support social inclusion of persons with disabilities, understanding the drivers of human migration, and engaging citizens in more sustainable modes of travel. Our education research is furthering our ability to create inclusive learning environments for Canadian children and youth.

Photo at top of page: Queen's research has received international recognition for work in carbon dioxide capture and transformation. In building productive, inclusive, and sustainable societies we will need to continue to advance technological solutions together with those that support landscape adaptation and human behaviour and policy change.

Queen's champions research that is breaking down barriers and our community is leading innovations in improving inclusion and equity for persons with disabilities. This includes participatory action-based research and the development of unique adaptive technologies to support social inclusion.

Queen's is committed to research practices grounded in informed consent and reciprocal relationships with Indigenous communities.

Photo: *Art and Waste Project Pangnirtung* by Micky Renders, PhD Student, Environmental Studies. Captured in Pangnirtung, Nunavut

TRANSFORM

Strategic Objectives

In setting these strategic objectives, we are positioning Queen's research to be integral to next-generation discovery and problem-solving and aligning our work with the goals and aspirations expressed by national and international research strategies and ecosystems, including the Dimensions Charter, the Scarborough Charter, The First Nations Principles of OCAP ®, the Principles of Ethical Métis Research, the National Inuit Strategy on Research, and the Declaration on Research Assessment (DORA).

Our strategic objectives chart a five-year course for how we will increase research support and output, creating the conditions for even greater impact in the academic community and beyond. Equally important is ensuring we have the flexibility to adapt and be responsive to new and emerging challenges and opportunities: as the world changes so do the needs and ambitions of our research community. We must be ready to support them.

Be at the forefront of discovery and research impact

The diversity and scale of knowledge creation in the Queen's community enables opportunities to understand and resolve some of the world's most complex issues. From new approaches to treating diseases to unraveling the mysteries of our universe or tackling climate change, the advancement of knowledge brings us closer to the solutions we need. These challenges exceed the individual and require the collective inputs of Queen's thought leaders and emerging thinkers, support networks, funders, partners, and decision-makers. Through this collaboration, we aim for our impact to be palpable on a global scale.

We will:

- Grow the number of identified strong research foci
- Increase our readiness for, relevance to, and alignment with philanthropic opportunities, national and global research priorities and to international funding opportunities, including Horizon Europe
- Excel in stewardship of Canada Foundation for Innovation Major Science Initiative platforms, research centres and institutes, and core research facilities
- Provide leveraged support to major interdisciplinary and partnered research funding applications
- Measure success by ranking among the top 10 research universities in Canada in terms of inputs (research funding support), outputs (scholarship in all its forms) and research impact (commercialization, thought leadership and influence, a thriving and agile research and innovation ecosystem)

Photo: The Queen's University Biological Station (QUBS) is one of the premier scientific field stations in Canada. It has recently expanded research capability through investment from the Canada Foundation for Innovation for environmental DNA work and state-of-the-art studies of local freshwater ecosystems. QUBS is currently planning the building of a new Indigenous Knowledge Centre to promote ethical ways of engaging Indigenous peoples and knowledge in co-creating strategies to tackle climate change, habitat alteration and destruction, and invasive species.

Build research excellence by attracting and developing talent

In an increasingly connected world, talent mobility is the greatest opportunity. Not only are higher education institutions competing nationally for the brightest minds, but they are also competing with institutions around the world. We are in an enviable position to attract top-tier research talent. To retain and develop these individuals into leading experts in their field, we will integrate research opportunities with their training at Queen's.

We will:

- Attract and retain world-class research talent, including faculty, staff, graduate students, and postdoctoral fellows
- Enhance talent development through the evaluation of the university research ecosystem to identify and address gaps and barriers, including those related to I-EDIAA
- Support the research trajectories of early-career researchers across disciplines
- Embed research as a fundamental component of the university's teaching mission by engaging students at all levels of their academic careers with research opportunities

Create greater research intersections between Queen's and partners

Kingston is home to Queen's, the Royal Military College of Canada, St. Lawrence College, and two affiliated research hospitals, Kingston Health Sciences Centre and Providence Care. The city is well positioned to become a key economic centre along the Toronto-Montreal corridor, and Queen's is ready to provide leadership in partnership-building across sectors.

We will:

- Create capacity to bolster regional economic development and cooperation
- Expand the scale and impact of fundamental and clinical health research through increased external funding and coordination across the university and its affiliated hospitals
- Pursue strategic partnership-building, both locally and farther away – we will demonstrate the value of locating in a smaller region anchored by strong post-secondary and research-focused health care institutions

Provide best-in-class research supports

We are committed to providing the research community with client-focused support. This means providing the research community with the tools they need to achieve their ambitions, safeguard their ideas and align their proposals and programs with the fundamental principles of I-EDIAA in research. Navigating the research system is increasingly complex, and we will ensure we have the resources, processes, and expertise in place across the university.

We will:

- Implement new platforms and tools that identify novel research funding opportunities
- Create modern systems and services to streamline administrative processes
- Provide advanced research computing and digital research services in support of all disciplines
- Promote Open Science and FAIR (Findable, Accessible, Interoperable, and Reusable) data principles within our research landscape
- Develop an I-EDIAA in research strategy in collaboration with the Vice-Principal Culture, Equity, and Inclusion portfolio and empower our researchers to implement I-EDIAA wise practices and considerations in their research programs
- Provide enhanced resources to support Indigenous and community-based research
- Work with faculties to ensure the operational sustainability of core facilities
- Prioritize safeguarding our research, ethics and compliance support, and protecting intellectual property
- Support our researchers in formalizing research agreements, mobilizing their research outcomes and impact, and in communicating their successes to different audiences, raising public awareness of the value of their research

RESEARCH

queensu.ca/research