

2024-2026

Research Plan Extension



Lakehead University's Centre for
Advanced Studies in Engineering
and Sciences (CASES)



Lakehead
UNIVERSITY

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Land Acknowledgment

Lakehead University respectfully acknowledges its campuses are located on the traditional lands of Indigenous Peoples. Lakehead Thunder Bay is located on the traditional lands of the Fort William First Nation, Signatory to the Robinson Superior Treaty of 1850. Lakehead Orillia is located on the traditional territory of the Anishinaabeg. The Anishinaabeg include the Ojibwe, Odawa, and Pottawatomi nations, collectively known as the Three Fires Confederacy. Lakehead University acknowledges the history that many nations hold in the areas around its campuses, and is committed to a relationship with First Nations, Métis, and Inuit Peoples based on the principles of mutual trust, respect, reciprocity, and collaboration in the spirit of reconciliation.

MESSAGE FROM THE Vice-President, Research and Innovation

LAKEHEAD UNIVERSITY

Extension of the Research Plan, 2024-2026

Lakehead University's 2018-2023 Strategic Plan was extended by the Board of Governors through to 2025, recognizing the Plan's continued relevance in moving the University towards achievement of its mission and vision as we adjust to an environment impacted by the global pandemic.

As one of three foundational plans for Lakehead University, the Research Plan was developed to align with Lakehead University's Strategic Plan and Academic Plan. Alignment is reflected through a shared commitment to the integration of teaching and research and the development and support of a culture of entrepreneurship at Lakehead University. Several members of the Research Planning Committee also served on Lakehead University's Strategic Planning Committee and/or Academic Planning Committee to advance shared strategic themes and goals.

With the extension of the Strategic Plan to 2025, Lakehead University's Academic Plan and Research Plan have also received two-year extensions from 2024-2026. Planning for the 2027-2032 Research Plan will begin in 2025 with a series of consultations with our internal and external community stakeholders.

Message from the Vice-President, Research and Innovation from the 2019-2024 Research Plan

I would like to welcome you to Lakehead University's 2019-2024 Research Plan. Since 1965, students have received quality education and opportunities to engage in research at Lakehead University. Close connections with faculty and programming that reflects our unique geographical location as the most northerly and westerly of all Ontario universities help make the Lakehead experience unique. Part of Lakehead University's mission is to be a comprehensive university, and we are proud to be the smallest university in Canada to have both a medical school and a Faculty of Law.

Over the past 15 years, Lakehead University has made great strides in expanding our research enterprise. The opening of Lakehead Orillia in 2006 significantly extended our reach throughout Ontario. We are proud to now be a comprehensive **and** research-intensive nationally-ranked university. ReSearch Infosource has named Lakehead University Canada's #1 Research University in our peer category for an unprecedented four consecutive years. In 2018, Maclean's ranked Lakehead as the #1 University in Canada within our category for total research dollars. Concurrent to this growth in research has been an increase in the number and diversity of our graduate programs.

The 2019-2024 Research Plan was developed in consultation with the university community, and reflects the evolution of research at Lakehead University. I would like to thank those who provided input into the Plan at various stages of its development. The research priorities outlined in this Plan honour our historical areas of strength and look to the future to capture emerging areas of growth. Although we have identified five research priorities, all areas and forms of research will continue to be supported and celebrated. Recognizing Lakehead's role as

a regional university, our research priorities are closely aligned with the social, cultural, and economic realities of Northwestern and Central Ontario. Our researchers respond to the needs of our surrounding communities by exploring such issues as responsible resource extraction, environmental sustainability, tourism, agriculture, medical imaging, and health equity, among others. Included in this Plan are five research initiatives with related strategies that provide direction to enhance our impact within our surrounding regions and beyond.

Lakehead University embraces diversity in research to reflect the increasing diversity of our University community and the populations we serve, including a high population of Indigenous students. This Plan values the inclusion of Indigenous worldviews and methodologies in research, and affirms our commitment to building partnerships with Indigenous Elders, communities, and organizations. The Research Plan also values global perspectives and extends Lakehead University's ongoing internationalization efforts.

The training of the next generation of researchers is an essential focus of the Research Plan. We take pride in engaging motivated students in dynamic research opportunities from their first year as undergraduates through postgraduate studies. Specific strategies related to increasing student participation in research are embedded throughout each of our research initiatives.

The Research Plan was developed to align with Lakehead University's 2018-2023 Strategic Plan in conjunction with the 2019-2024 Academic Plan. These plans share a commitment to the integration of teaching and research and the development and support of a culture of entrepreneurship.

The Research Plan promotes innovation across the spectrum from commercialization to social innovation to various forms of knowledge translation. This Plan also commits to supporting discovery-based research as one of our core strengths.

A man with short, light brown hair, wearing a teal suit, a light blue shirt, and a patterned tie, stands in front of a large window. He is leaning on a glass railing with his hands clasped. The background shows a modern building with a grid of windows.

Research and the pursuit of creative activities are foundational to the existence of a university. The 2019-2024 Research Plan sets forth an ambitious and diverse research agenda that reflects our strengths today and articulates aspirations of where we might be in five years. I am confident that by working together, we will achieve the vision for research and innovation at Lakehead University that is communicated in the Research Plan.

Sincerely,

Dr. Andrew P. Dean
Vice-President, Research and Innovation

Introduction

FROM 2019-2024 RESEARCH PLAN

Lakehead University's 2019-2024 Research Plan operationalizes many of the strategic themes set forth in Lakehead University's 2018-2023 Strategic Plan. The research priorities and initiatives outlined in this Plan help advance Lakehead University's overall pursuit of **academic excellence**.

This Plan affirms commitments to **social responsibility** through research priorities that explore social justice and sustainability, and initiatives related to community-engaged research and supporting innovation. Developing and nurturing **local and global partnerships**, including relationships with Indigenous partners, helps facilitate research across all disciplines. **Entrepreneurship and innovation** are often outcomes of research, and Lakehead is committed to leading innovation in Northwestern Ontario and Simcoe County in support of culturally appropriate and environmentally sustainable social and economic objectives. By enhancing research opportunities and training for students and postdoctoral fellows and advancing research excellence among students and faculty, this Plan extends Lakehead University's commitment to **capacity development**.

The Research Plan was also developed to advance the academic priorities and strategies within the 2019-2024 Academic Plan that relate to research such as the pursuit of innovative and impactful research, scholarship, and creative activities. Many of the strategies outlined in the Academic Plan correspond to central themes that are embedded within the Research Plan, including engaging with communities, advancing truth and reconciliation, championing inclusion, developing and sustaining global perspectives, and developing people, places and systems. The alignment of Lakehead University's Academic and Research Plans is a testament to the strong ties between teaching and research at this institution.

MAJOR OBJECTIVES OF THE RESEARCH PLAN

- To strengthen research and scholarly activity at Lakehead that is of outstanding quality and leading in its innovation, especially in strategic interdisciplinary research areas that are prominent at, or unique to, Lakehead University among Canadian universities, while allowing for the development of new emerging areas of concentration, with the long-range objective of creating new institutional centres of research excellence;
- To enhance the training of highly qualified personnel (HQP is defined as undergraduate/graduate students and postdoctoral fellows), by increasing the number of HQP, and by providing a highly stimulating research environment for all of our students that establishes Lakehead as a leader in the integration of research and teaching;
- To ensure researchers have access to superior research resources and infrastructure at both of our campuses and to manage these to ensure their effective and efficient use. A vibrant and well-resourced library is essential to sustaining Lakehead's research enterprise. The Library plays a key role in ensuring primary and online materials, journals, databases, and references are easily accessible for researchers;
- To develop new research partnerships with communities, businesses, industries, government, other academic institutions and other partners, regionally nationally and internationally; and
- To enhance knowledge mobilization, translation, transfer and application in order to maximize their benefits to society in Northwestern Ontario, Simcoe County, and beyond.





RESEARCH PLAN DEVELOPMENT PROCESS AND FRAMEWORK FROM 2019-2024 RESEARCH PLAN

The 2019-2024 Research Plan was developed by the Research Planning Committee, co-chaired by the Vice-President, Research and Innovation and Chair of the Senate Research Committee. The Research Planning Committee was formed in October 2017 with representation from faculty members across disciplines, the Faculty of Graduate Studies, the Office of Research Services, the Office of Institutional Planning & Analysis, external partners, and graduate students. Several of these members were also members of Lakehead University's Strategic Planning Committee and/or Academic Planning Committee to ensure strategic alignment among these institutional plans.

In summer 2018, faculty members were invited to complete a survey to provide feedback on the previous plan and input into the 2019-2024 Research Plan. The survey results informed the development of a draft Research Plan, which was then shared with the university community for further input through a series of consultation sessions that included all faculties, directors of research centres and institutes, the Library, the Northern Ontario School of Medicine, the Board of Governors, the Ojimaawin-Aboriginal Governance Council, the President's Advisory Council on Economic Development for Simcoe County, Senate committees, and faculty members at Lakehead Orillia. The feedback was incorporated into a revised draft that was posted online for additional input before being endorsed by the Senate Research Committee and presented to Senate for final approval.

This Research Plan is organized in three sections to guide research at Lakehead University over the next five years:

- **Principles** – Beliefs and values underlying research at Lakehead University
- **Priorities** – Research areas where Lakehead University has demonstrated strength and authenticity
- **Initiatives** – University-wide research directions to enhance research at Lakehead University

The research priorities described in this Plan build on the priorities of the previous plan to reflect the progress made during that plan's implementation, and to capture the evolution of research at Lakehead University.

The Research Planning Committee established the following criteria to identify research priorities for the 2019-2024 Research Plan:

1. Cluster of researchers making significant contributions in the area
2. Measurable level of significant external funding and/or research contributions in the research area
3. Graduate programs in the research area
4. Benefits to the region and wider communities in terms of social and economic development
5. Identifiable local, regional, national, and/or global partnerships
6. Research area represents emerging strength
7. Human and infrastructure capacity (e.g. specialized labs, infrastructure, Research Chairs) in the area
8. Senate-approved research centres or institutes in the area
9. Undergraduate courses in the area that provide opportunities for students to be involved in research

The 2019-2024 Research Plan charts an ambitious course to guide research at Lakehead University over the next five years. The Senate Research Committee will review progress made on the implementation of the Research Plan biannually. Many of the strategies outlined in the Research Plan are connected to broader objectives within Lakehead University's Strategic Plan and Academic Plan. Progress on these strategies will be tracked based on the metrics developed within these Plans.

Research Principles

The following principles capture the core beliefs and values for research at Lakehead University:

Equity, Diversity, and Inclusion

Lakehead University is committed to providing a research environment that continually strives to stimulate creativity and innovation. We as an institution strive to ensure, understand and celebrate equity, diversity and inclusion of all our members, including equity-seeking groups, so as to ensure equal opportunity for participation in research and innovation. Equity-seeking groups include, but are not limited to, women, Indigenous Peoples, persons with disabilities, racialized persons, and persons who identify as lesbian, gay, bisexual, transgender, queer, or two-spirit. Collaborative research offers an opportunity for reconciliation with Indigenous Peoples and a renewed relationship built on the mutual respect for different ways of knowing.

Lakehead University is committed to attracting and retaining students, faculty and staff from all backgrounds and to being active champions of equity, diversity and inclusion on our campuses and in our communities. To this end, Lakehead University will continue to support change by continuing to implement Lakehead University's Canada Research Chairs Equity, Diversity and Inclusion (EDI) Action Plan and throughout the university's academy through the Lakehead University EDI Action Plan.

Ethical Conduct of Research and Processes

Lakehead University is dedicated to educating and supporting all researchers to uphold the highest standards in the ethical conduct of research and will continue to support and share best practices. In particular, Lakehead University will ensure that all faculty, students and staff who engage in research with Indigenous Peoples do so in a mutually respectful and collaborative manner. Lakehead University acknowledges the unique status of Aboriginal Peoples and their treaty rights; research involving Indigenous Peoples will ensure that their diverse and distinct worldviews are represented in planning and decision-making, from the conception of a research project and design, through to the analysis and dissemination of research results. Respectful engagement with Indigenous Peoples and communities is an integral part of ethical research involving Indigenous Peoples.

Research Excellence

Excellence is the foundational principle in the pursuit of knowledge and research at Lakehead University. Lakehead University values, supports, promotes, and celebrates all contributions to research (including basic and applied), creative activities and outputs, and innovation. Lakehead University is committed to increasing research excellence through equity, diversity and inclusion; we recognize that the relevance and/or impact of research are different for different populations and contexts and that a broader understanding and more inclusive definition of research excellence must be supported in evaluating research outcomes. Measures will be implemented to ensure that the full spectrum of talented researchers can equitably access and benefit from research opportunities, including research appointments, career advancement, training and internships, research awards, research facilities, etc. Furthermore, Lakehead University acknowledges the importance of Indigenous perspectives and ways of knowing in achieving research excellence and impact through community-engaged research.



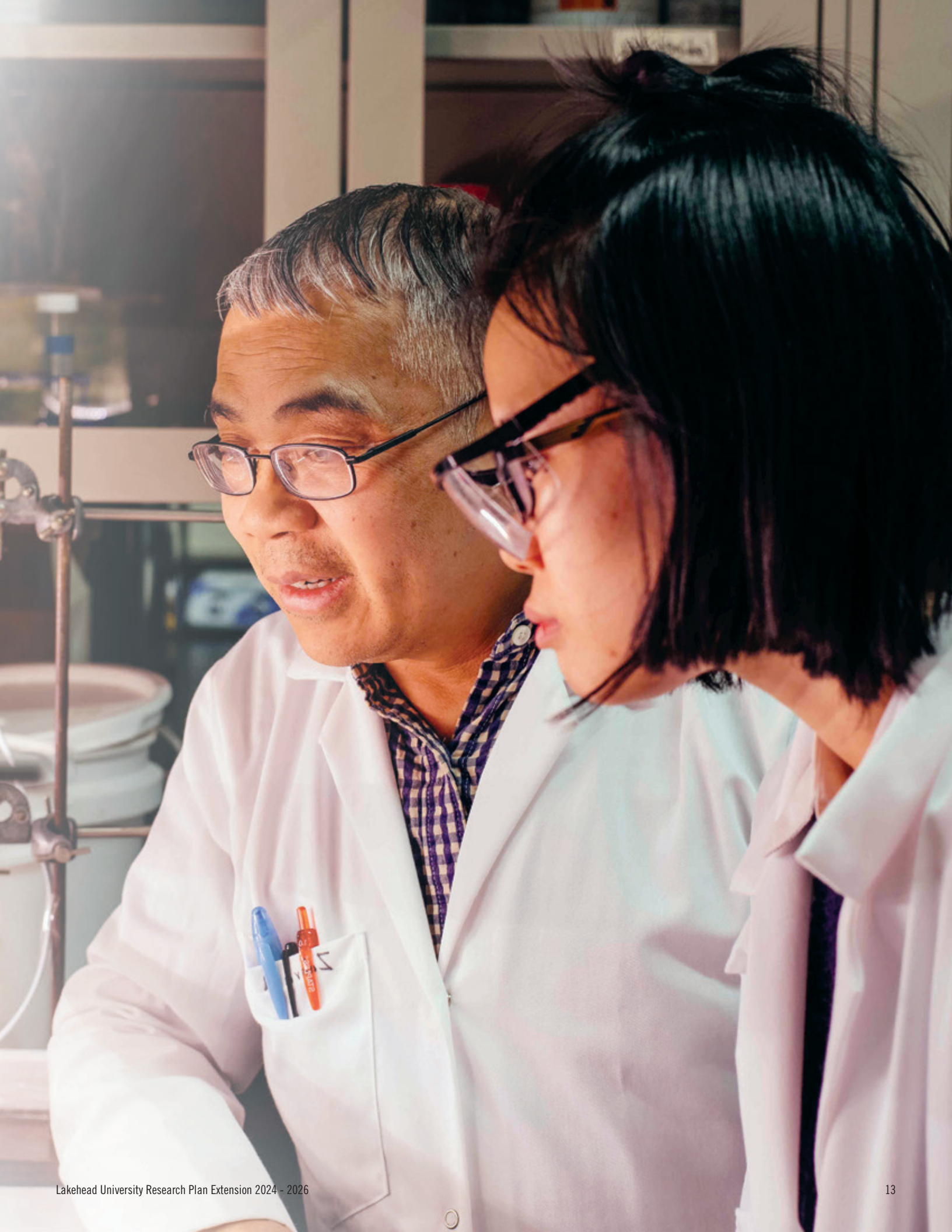
Research Priorities

While it is recognized that all research and scholarship being carried out at Lakehead University can enhance our reputation, we must focus our resources towards building depth and achieving excellence in areas of high research activity while continuing to expand research and other scholarly and creative activities across disciplines.

Lakehead University has identified five research priorities:

- Cultures, Societies, and Social Justice
- First Nations, Métis, and Inuit Research
- Health and Well-Being
- Informatics, New Materials and Technologies
- Sustainability, Resources, and the Environment

Although research at Lakehead University has a global reach, much of our research is influenced by the unique social and cultural conditions and geographic settings in which our two campuses are located. Across all research priorities, our research responds to regionally relevant issues throughout Northwestern Ontario and Simcoe County, including Indigenous communities, to support regional development, connection, and innovation. The geography and history of our location in Northwestern Ontario have connected Lakehead University to a number of research partners in similar environments, including Nordic countries, Russia, and the northern United States. Lakehead University will continue to foster these partnerships as part of our efforts to internationalize research at our campuses.





PRIORITY:

Cultures, Societies, and Social Justice



Lakehead University has a strong tradition of research focusing on the complex ways in which cultures and societies around the world develop, communicate, and organize themselves. Much of this research examines the ways in which languages, values, norms, literatures, arts, technologies, organizations, and institutions inform and shape historical and contemporary lives. An emphasis of this research is social justice, which refers to the belief that the world should be organized and governed in ways that allow for and promote equality, fairness, dignity, solidarity, and institutional accountability. Proponents of social justice work to address inequalities based on differences such as income, race, gender, age, ability, and sexual orientation. These inequalities can include restricted access to health care, education, language and cultural expression, suitable housing, legal services, resources including healthy food and clean water, freedom of thought, political liberty, technology, workplace inclusivity, growth opportunities, and basic human rights. Social justice is achieved when all members of society flourish and when all people are valued and cared for, feel a sense of dignity in their everyday lives, and can participate in their worlds as empowered social agents. Similarly, peace and conflict resolution aims to understand the behaviours and structures that contribute to conflict, and the interdisciplinary work that can help prevent and deflate such conflicts.

Lakehead University researchers are undertaking a variety of research projects and creative activities that relate to cultures, societies, and social justice. Examples include studies on how northern communities can benefit in a more equitable manner from the development of their respective region's natural resources. Other areas of research include developing a national food policy for Canada, food security in remote First Nations communities, northern and culture-based tourism, environmental and place-based education, arts-integrated education, the effect of body cameras on policing, Indigenous storytelling, and media studies. A deeper understanding of the cultures and histories of the original peoples of Northwestern Ontario is being developed through archaeological studies in collaboration with Indigenous communities. New initiatives such as the ReImagining Value Action Lab are facilitating the connections between creative activity and social justice. Another area of strength is in gender, sexuality and women's

studies, including projects on women's experiences of sexual assault and/or domestic violence and the legal system, feminist praxis and pedagogy, women's experiences of Islamophobia, and the aging and health care experiences of LGBTQ+ Canadians. A number of Lakehead University's research centres and research chairs are enhancing research related to the area of cultures, societies, and social justice.

Relevant Research Centres and Institutes

- Anishinaabe Kendaasiwin Institute (AKI)
- Centre for Education and Research on Aging & Health (CERAH)
- Centre of Education and Research on Positive Youth Development (CERPYPD)
- Centre of Excellence for Sustainable Mining & Exploration (CESME)
- Centre for Health Care Ethics (CHCE)
- Centre for Innovation and Entrepreneurship Research (CIER)
- Centre for Rural & Northern Health Research (CRaNHR)
- Lakehead Social History Institute (LSHI)
- Research Centre for Sustainable Communities (RCSC)
- Research Institute for Enhancing Prevention of Injury and Disability at Work (EPID@Work)

Graduate Programs Related to this Priority

- Master of Arts in English and Cultural Studies
- Master of Arts in History
- Master of Arts in Social Justice
- Master of Arts in Sociology
- Master of Arts - Specialization in Gender and Women's Studies
- Master of Education - Education for Change
- Master of Environmental Studies
- Master of Health Sciences
- Master of Public Health
- Master of Science in Archaeological Science
- Master of Social Work
- Joint PhD in Educational Studies
- PhD in Health Sciences



PRIORITY:

First Nations, Métis, and Inuit Research



Lakehead University recognizes the importance of prioritizing community-based research with Indigenous community research partners. The inclusion of Indigenous issues and Indigenous Peoples (students, researchers, community members) in our institutional plans is an indicator of continued efforts to build capacity in Northwestern Ontario and Simcoe County to address the recommendations of the Truth and Reconciliation Commission of Canada (TRC) and Universities Canada Principles on Indigenous Education. Research in this area must be informed by these foundational documents, but should also consider directions for future relationships with Indigenous Peoples. Lakehead University's Faculty of Law specializes in Indigenous law and is committed to providing access to justice in northern communities. Lakehead University is committed to expanding partnerships with Indigenous communities. The impact of Indigenous research focused on community needs in areas ranging from the arts to health, education, science, land management, culture, and law is vital and far-reaching. The revitalization of Indigenous languages, culture, and self-governance continue to be strengthened by community-based research efforts. Lakehead University values the wisdom of Elders and Indigenous community partners to help inform research projects and partnerships. As Lakehead University advances this research priority, we recognize the importance of pursuing research that is grounded in Indigenous knowledge and traditions, including oral traditions, and that applies culturally appropriate methodologies.

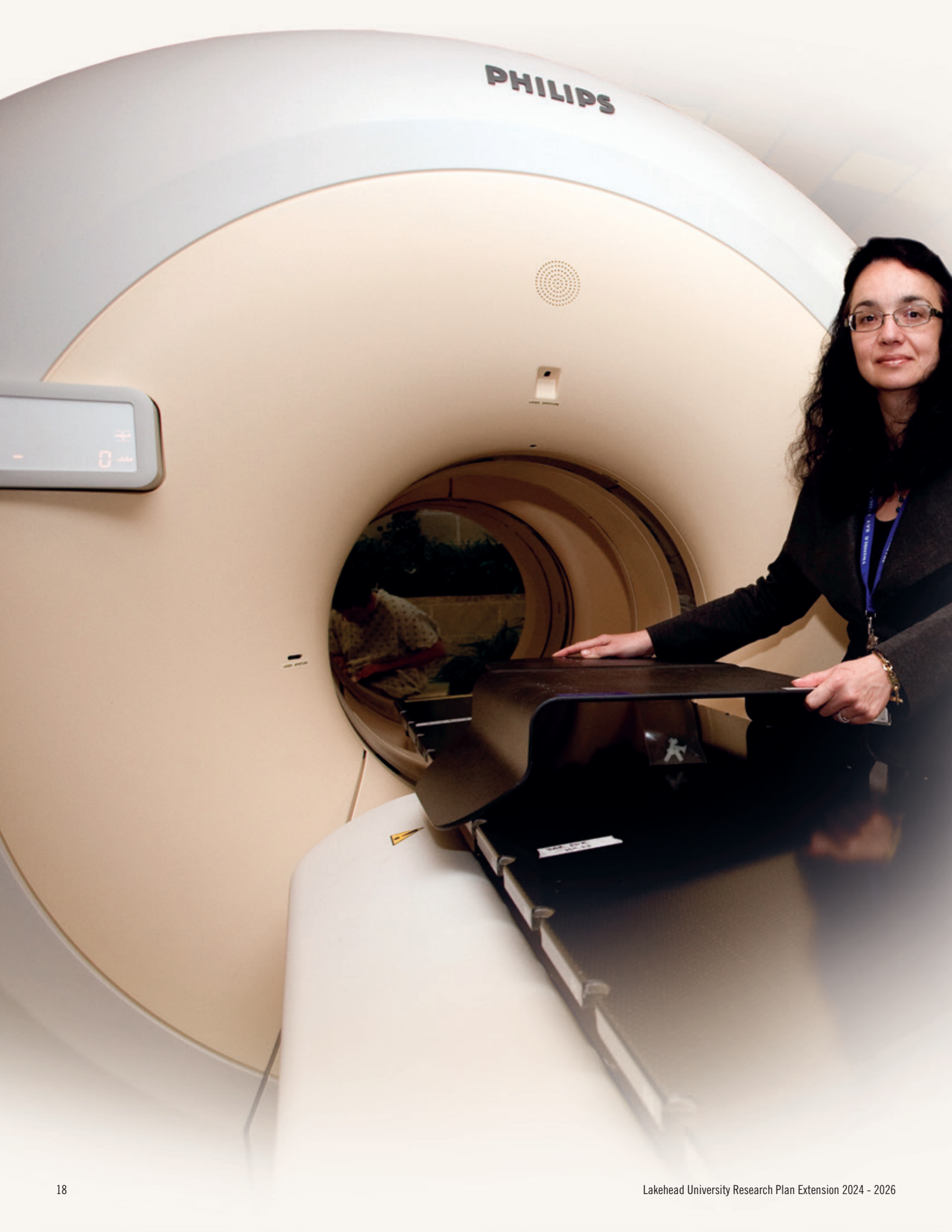
Examples of research areas include: indigenization and decolonization of the curriculum; antiracism strategies; Indigenous self-governance and ways of knowing; preservation of Indigenous artifacts, language and culture; culturally relevant Indigenous education; digital storytelling methodologies with Indigenous youth to preserve language and history; food security in First Nations communities; social determinants of health; and culturally relevant health care for Indigenous Peoples.

Relevant Research Centres and Institutes

- Anishinaabe Kendaasiwin Institute (AKI)
- Centre for Education and Research on Aging & Health (CERAH)
- Centre of Excellence for Sustainable Mining & Exploration (CESME)
- Centre for Health Care Ethics (CHCE)
- Centre for Rural & Northern Health Research (CRaNHR)
- Research Institute for Enhancing Prevention of Injury and Disability at Work (EPID@Work)

Graduate Programs Related to this Priority

- Master of Arts in English and Cultural Studies
- Master of Arts in Social Justice
- Master of Education - Specialization in Indigenous Education
- Master of Environmental Studies
- Master of Science in Archaeological Science
- Master of Science in Forestry
- Master of Social Work
- Joint PhD in Educational Studies
- PhD in Forest Sciences



PHILIPS

PRIORITY:

Health and Well-Being

Researchers in this area aim to make a concrete difference in the health and well-being of our communities across the age and health continuum. The research conducted also has a focus on Indigenous and rural issues, recognizing that being situated at a distance from major urban centres can pose considerable challenges to the maintenance of good health. Through an agreement with the Northern Ontario School of Medicine University (NOSM U), Lakehead University administers, promotes, and facilitates research from NOSM U faculty. A strong partnership has also developed over the years between Lakehead University and the Thunder Bay Regional Health Research Institute (TBRHRI), resulting in the cross-appointment of several joint research chairs at both institutions.

Faculty members and trainees from various departments, schools, and faculties of Lakehead University are involved in health-related research. Areas of focus, among many, include rural and remote health, aging, addictions and mental health, child and youth resilience, well-being and health, maternal and women's health, occupational health and safety, health informatics, medical imaging, food security, and the impact of climate change on health. While health research is already vibrant at Lakehead University, its potential for growth and for the development of fruitful partnerships, both within academia and with government, non-profit and private partners, is considerable, and is reflected by on-going development of graduate and undergraduate programs. Through the activities of the University, researchers, and their partners, health research will continue to grow at Lakehead University, and will provide tangible societal benefits for our regions and beyond.

Relevant Research Centres and Institutes

- Anishinaabe Kendaasiwin Institute (AKI)
- Centre for Education and Research on Aging & Health (CERAH)
- Centre of Education and Research on Positive Youth Development (CERPYPD)
- Centre for Health Care Ethics (CHCE)
- Centre for Research on Safe Driving (CRSD)
- Centre for Rural & Northern Health Research (CRaNHR)
- Research Institute for Enhancing Prevention of Injury and Disability at Work (EPID@Work)

Graduate Programs Related to this Priority

- Graduate Diploma in Professional Kinesiology
- Master of Arts in Clinical Psychology
- Master of Education - Specialization in Environmental and Sustainability Education
- Master of Health Sciences
- Master of Nursing - Advanced Practice Specialization
- Master of Nursing - Nurse Practitioner Specialization
- Master of Public Health
- Master of Science in Chemistry
- Master of Science in Kinesiology
- Master of Science in Physics
- Master of Science in Psychological Science
- Master of Social Work
- PhD in Biotechnology – Medical Biotechnology
- PhD in Chemistry and Materials Science
- PhD in Health Sciences
- PhD in Psychology - Clinical Psychology
- PhD in Psychology - Psychological Science



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PRIORITY:

Informatics, New Materials and Technologies

Rapid advancements in technology are creating new opportunities for innovation for Lakehead researchers.

Integrated hardware, software, and communication links are essential for modern society. The safety, efficiency and reliability of critical municipal and industrial infrastructure in our regions, such as electrical power stations, communication technologies, paper mills, mineral processing facilities, and renewable energy installations, are significantly improved through the application of advanced technologies. Cyber-security, advanced control systems, smart sensors, predictive maintenance and processes, and health-condition monitoring and optimization will lower operating costs and increase safety and productivity. Also, new and optimized artificial intelligence algorithms have shown immense potential for economies of scale in big data analytics industries.

Researchers at Lakehead University are making significant contributions to the areas of information and communications technology, control systems, along with advanced computing technologies, enhanced medical imaging technologies, mobile computing for health-related applications, fire-resistance testing of construction materials, and robotics and drones. Additionally, our researchers provide expertise in the areas of environmental biotechnology, biomedical and molecular biotechnology, as well as in material science, polymer physics, biophysics, and clean water technologies. Social sciences and humanities researchers are also engaged with new technologies through such areas as digital media technologies, big data, data journalism, and mass communications. Lakehead researchers are also investigating the ways in which advancements in technology have radically altered how society creates and receives news, participates in cultural industries, and drives social change.

Relevant Research Centres and Institutes

- Biorefining Research Institute (BRI)
- Centre for Innovation and Entrepreneurship Research (CIER)
- Green Processes Research Centre (GPRC)
- Lakehead University Centre for Analytical Services (LUCAS)

Graduate Programs Related to this Priority

- Master of Arts in English and Cultural Studies
- Master of Arts in Economics
- Master of Business Administration
- Master of Science in Chemical Engineering
- Master of Science in Chemistry
- Master of Science in Civil Engineering
- Master of Science in Computer Science
- Master of Science in Electrical and Computer Engineering
- Master of Science in Mathematical Sciences
- Master of Science in Mechanical Engineering
- Master of Science in Physics
- PhD in Chemistry and Materials Science
- PhD in Civil Engineering
- PhD in Electrical and Computer Engineering
- PhD in Mechanical Engineering



PRIORITY:

Sustainability, Resources, and the Environment

Interdisciplinary research with applications to sustainability, resources, and the environment is a natural area of focus at Lakehead University due, in part, to our geographical locations. The Thunder Bay campus is situated in the boreal forest, one of the largest ecosystems on Earth, and in the Lake Superior watershed; the Orillia campus is situated in Central Ontario where different land uses abound (e.g. agriculture, housing, recreation, industry). A number of our researchers are involved in promoting the sustainability and preservation of our regional ecologies. Respect for the land and the environment is particularly important for Indigenous communities where the land is closely connected to culture, spirit, language, and identities.

Lakehead University's Strategic Plan and Academic Plan affirm our commitment to sustainability, which has emerged as a dynamic area of research. The 2019-2024 Sustainability Plan defines sustainability in a pluralistic and inclusive way, encompassing human and ecological health, social justice and equity, Indigenous rights, secure livelihoods, workplace well-being, and leadership for vibrant and resilient communities.

Research that supports resource discovery and methods of extraction and value optimization has been a long-standing strength at the University, and is vital to our regional economies. Such methods and processes are continually evolving, and much of the research in this area focuses on reducing the environmental impact of resource extraction.

Some examples of ongoing research in this area include climate change education; Indigenous land-based education; place and sustainability studies; wildlife tourism; ecocriticism and environmental literature; the development of value-added green materials, chemicals and products from forest biomass; biorefining; northern-based agriculture; sustainable marketing of heritage crops; use of aerial technology in land use planning and monitoring; land and water reclamation and remediation; climate change impact on northern communities, forests, lakes and aquatic species; advanced exploration methods, etc. The Lake Superior Living Labs Network will provide an important connection between sustainability and the Great Lakes watershed.

Relevant Research Centres and Institutes

- Anishinaabe Kendaasiwin Institute (AKI)
- Biorefining Research Institute (BRI)
- Centre of Excellence for Sustainable Mining & Exploration (CESME)
- Green Processes Research Centre (GPRC)
- Lakehead University Centre for Analytical Services (LUCAS)
- Research Centre for Sustainable Communities (RCSC)
- Research Institute for Enhancing Prevention of Injury and Disability at Work (EPID@Work)

Graduate Programs Related to this Priority

- Master of Arts in English and Cultural Studies
- Master of Arts in Social Justice
- Master of Education - Specialization in Environmental and Sustainability Education
- Master of Environmental Studies
- Master of Forest Management
- Master of Health Sciences – Specialization in Social-Ecological Systems, Sustainability and Health
- Master of Public Health
- Master of Science in Archaeological Science
- Master of Science in Biology
- Master of Science in Environmental Engineering
- Master of Science in Forestry
- Master of Science in Geology
- Master of Science in Physics
- PhD in Biotechnology
- PhD in Chemistry and Materials Science
- PhD in Health Sciences
- PhD in Forest Sciences

Research Initiatives

A research initiative is a university-wide project or program to enhance the state of research and innovation capacity at Lakehead University. Over the next five years, Lakehead University will focus efforts on the following research initiatives:

- Enhancing Research Opportunities and Training for Students and Postdoctoral Fellows
- Advancing Research Excellence
- Community-Engaged Research
- Internationalization of Research
- Supporting Innovation





INITIATIVE:

Enhancing Research Opportunities and Training for Students and Postdoctoral Fellows

Lakehead University's Strategic Plan encourages hands-on, experiential learning opportunities for all students. Applied research, innovation, and entrepreneurship have been embedded in curricula across disciplines, creating many opportunities for students to become involved in research. Undergraduate students have the opportunity to present their work at the Lakehead University Undergraduate Student Research Conference held annually as part of Research & Innovation Week.

The Post: Lakehead University's Undergraduate Journal and *The Artery* provide opportunities for undergraduate students in the social sciences and humanities to publish their work in an interdisciplinary professional journal. The Office of Research Services, through the Mitacs program, provides Lakehead students the opportunity to spend 12 – 24 weeks abroad pursuing a research project. Many students have had the opportunity to participate in exciting,

cutting-edge research projects at Lakehead that have had a positive impact on the wider community through applied and community-based research. The majority of external research funding supports the training of highly qualified personnel. Over 30 postdoctoral fellows annually have benefitted from advanced training opportunities with Lakehead faculty.

WHERE DO WE WANT TO BE IN FIVE YEARS?

Lakehead University will increase research opportunities for students over the next five years. We will continue to be recognized as a university that values diversity, experiential learning, and provides boundless opportunities for undergraduate and graduate students to engage in research opportunities in Canada and internationally. Lakehead University will also be known as a destination of choice for students from abroad wanting to work with faculty at Lakehead who are at the forefront of research. Our researchers will embrace the opportunity to bring their own research into the classroom to enrich the learning environment. Lakehead's courses will continue to provide students across disciplines the opportunity to develop their own research and to participate in ongoing research projects with faculty, recognizing that engaging in research enhances student learning through mentorship, development of analytical skills, and understandings of research methodologies and techniques. Further expanding research opportunities at the undergraduate level and encouraging the pursuit of graduate studies will help develop the pipeline for the next generation of researchers at Lakehead University.

STRATEGIES

- Create a new Undergraduate Research Experience Program (UREP) modeled after the NSERC Undergraduate Student Research Awards (USRA) program to create experiential learning opportunities that will lead to increased graduate student enrolment at Lakehead
- Offer workshops to faculty on developing equity, diversity and inclusion strategies within research programs to enhance the recruitment and retention of students and postdoctoral fellows from all equity-seeking groups

- Increase the number of graduate students based in Orillia
- Support expansion of community-service learning opportunities and undergraduate research opportunities within research projects and the curriculum
- Offer research workshops to undergraduate students through the Office of Research Services
- Develop strategies to increase the number of international tuition waivers and scholarships
- Provide clarity for prospective graduate students regarding funding packages
- Work with Graduate Studies to establish an Indigenous graduate student scholarship program
- Provide opportunities for undergraduate and graduate students to disseminate research results
- Support the undergraduate and graduate student conferences as part of Research & Innovation Week
- Explore the development of funding opportunities to support student attendance at scholarly conferences
- Increase research internship opportunities for students through external funding (e.g. FedDev, FedNor, Mitacs, Northern Ontario Heritage Fund Corporation, Ontario Centres of Excellence, Venture for Canada)
- Establish three Lakehead University Postdoctoral Fellowships (CIHR, NSERC, and SSHRC)



INITIATIVE:

Advancing Research Excellence

Advancing research excellence is integral to the theme of academic excellence within Lakehead University's 2018-2023 Strategic Plan. Attracting, retaining, developing, and replacing top researchers is vital to promoting research excellence at Lakehead University.

One way Lakehead University celebrates excellence among our faculty and student researchers is through internal awards. The Distinguished Researcher Award is the highest honour conferred by Lakehead University for research and scholarly activity. This award recognizes a full career of internationally-recognized intellectual contributions. The Contributions to Research Awards recognize outstanding research activity by Lakehead University faculty. The Lakehead University Research Chairs (LURCs) program recognizes high quality research, scholarly and creative achievement by providing a two-year research grant to support an individual's program of research.

Research excellence is promoted throughout the year, but especially during our annual Research & Innovation Week. A number of awards are given out during this week, including the Faculty Innovation, Building Research Capacity, Community-Engaged Research, and Indigenous Partnership Research awards. Achievements in graduate student research are celebrated through the Student Innovation, Three-Minute Thesis, and Graduate Student Research Excellence awards, which encourage high quality presentations and publications by graduate students.

The contributions of faculty and students are also promoted locally, nationally, and internationally to raise the profile of Lakehead University's research activity and expertise. Faculty members are encouraged to apply for local recognition of their research through programs such as the RBC Innovation Awards and the Chamber of Commerce Business Excellence Awards.

The Office of the Vice-President, Research and Innovation takes a strategic approach to securing research awards and grants, and submits worthy candidates for a number of external awards such as the Killam Prize and membership in the Royal Society of Canada. Undergraduate student research is also supported through, for example, the sponsorship of an undergraduate student to present his/her research at the Undergraduate Network for Research in the Humanities (UNRH).

Lakehead University recognizes the need to support faculty throughout their careers in order to achieve research excellence. Research and innovation workshops, peer mentorship, tri-council enhancement programs, internal grants, and opportunities to work with grant writers and research facilitators are current examples of such support. Some additional strategies to support faculty researchers are listed below.

WHERE DO WE WANT TO BE IN FIVE YEARS?

Lakehead University will raise the local and global profile of our research activity and expertise. We will increase the level of support in memberships and societies, such as Research Canada and the Royal Society of Canada, which allow Lakehead faculty opportunities for external nominations and awards. A key goal is to increase the number of successful applications submitted for external research awards. A faculty-based research chair program will be developed that recognizes research excellence across all faculties. Acknowledging and rewarding research excellence is critical for retaining leading researchers who have big ideas that make the world a better place.

STRATEGIES

- Increase the number of externally-funded research chairs
- Collaborate with the deans to develop a faculty-based research chair program that recognizes excellence within each faculty through grants and time release
- Provide support for interdisciplinary teams and their partners applying for large institutional grants
- Collaborate with Graduate Studies to develop a program that highlights graduate student excellence and research stories
- Publish print and online communications that promote research success stories, including an annual Research Excellence report, Research & Innovation Week viewbook, and monthly *Chronicle Journal* Research in Action stories
- Establish new awards for faculty and students (e.g. Sustainability, International Research Partnerships, Service to Research, Excellence in Graduate Student Supervision, Scholarship of Teaching and Learning), and actively seek out donations and sponsorships for such awards
- Support and encourage internal faculty members to enhance their research profiles and dossiers, so they become strong applicants for national and international external awards (e.g. Royal Society of Canada, Killam Prize)
- Encourage and reward the participation of faculty members in external review panels
- Hold a professional development workshop series to assist faculty with a variety of research, funding, knowledge mobilization, and innovation topics
- Develop a database of research experts at Lakehead University



INITIATIVE:

Community-Engaged Research

One of the ways this Research Plan advances the implementation of Lakehead University's Strategic Plan's theme of local and global partnerships is through community-engaged research. Lakehead University has a long history and reputation of excellence in community engagement regionally, nationally and internationally. Re\$earch Infosource ranked Lakehead University number one University of the Year for *Not-for-Profit Research Partnerships*,

2013-2017. The areas of focus for community-engaged research at Lakehead University are broad and far reaching, from understanding food sovereignty in northern communities, to working with local schools to address youth at risk, to mapping natural, cultural and sustainable tourism resources in our communities, to making our communities more age friendly. As exemplified by extensive engagement with Indigenous communities, Lakehead research

is well positioned to significantly contribute to the Truth and Reconciliation Commission of Canada: Calls to Action and Universities Canada Principles on Indigenous Education through community-engaged research. Such research helps build a culture of engagement between Lakehead University and the diverse communities we serve.

WHERE DO WE WANT TO BE IN FIVE YEARS?

Lakehead University is committed to the social, cultural and economic development of its many partnering communities, and is particularly engaged with Indigenous communities. Through community-engaged research, Lakehead University will bring together community and campus research skills and resources in order to advance community-identified research goals that will lead to a more sustainable, just and healthy society. We will strengthen existing partnerships while developing new opportunities for outreach, collaboration, and knowledge creation and exchange. We will respect diverse forms of knowledge that are based around the principles of social responsibility, respect, reciprocity, open access, knowledge creation, and social and ecological justice. Our students will graduate having had increased opportunities to participate in experiential and community-service learning opportunities through community-engaged research initiatives.

STRATEGIES

- Establish a Community-Engaged Research Advisory Committee to the Vice-President, Research and Innovation to identify strategies that will promote the growth of, and support of, CER
- Create a new Community-Engaged Research Award to recognize and reward community-engaged research
- Offer workshops focused on effective knowledge mobilization and research partnership strategies, including topics focused on the ethical conduct of research with Indigenous Peoples
- Explore institutional models to coordinate, promote and support expansion of CER, knowledge mobilization and social innovation initiatives (e.g. Office of Community-Engaged Research, research shops, living labs, etc.)
- Support joint initiatives with the City of Thunder Bay through the recently signed Memorandum of Understanding and pursue similar initiatives in Orillia and Central Ontario
- Promote community-service learning opportunities through research initiatives
- Explore ways of recognizing and promoting CER
- Implement Indigenous research guidelines for all research that supports the Truth and Reconciliation Commission of Canada: Calls to Action and Universities Canada Principles on Indigenous Education



INITIATIVE:

Internationalization of Research

Developing global perspectives through ongoing internationalization of Lakehead University campuses, curricula, and increased experiential learning opportunities across disciplines has emerged as a central tenet of Lakehead University's Strategic

and Academic Plans. Researchers at Lakehead University are proud to be part of a global network of collaborators. We currently have over 100 memoranda of understanding and agreements with institutions from approximately 30 countries

to support research collaborations and student exchanges. Funding for international research projects is available through opportunities such as the Mitacs Globalink program.

WHERE DO WE WANT TO BE IN FIVE YEARS?

Lakehead University will increase its international research profile over the next five years to be a destination of choice for students from all over the world, with particular emphasis on graduate students and postdoctoral fellows. Faculty and graduate students will have opportunities to collaborate with international partners through enhanced research mobility and access to international funding opportunities. The number of multidisciplinary and multi-institutional research initiatives and joint funding applications submitted will increase.

Lakehead University is committed to enhancing our international research reputation and understanding of global challenges through increased engagement with international partners. We will build and expand our network of international research relationships. We will maximize opportunities for our researchers to be engaged in international networks and funding programs. Our graduate students will have increased opportunities for international training opportunities. Lakehead University will raise the global profile of our research activity and expertise by developing informed research strategies and opportunities with our international partners.

STRATEGIES

- Hire an International Research Facilitator in the Office of Research Services who will seek opportunities to expand international research partnerships and collaborations for Lakehead faculty and graduate students
- Establish International Research Partnership Awards to provide seed grants for faculty members to establish long-term research collaborations with international partners
- Facilitate and support research collaborations between Canada and Latin America through the Canada and Latin America Research & Exchange Opportunities (CALAREO) Consortium
- Encourage partnerships that result in national and international grants to enhance research collaborations and training of graduate and undergraduate students
- Lead the establishment of an International Research Centre. Such a centre could involve engagement with Indigenous communities, resource extraction, agriculture, biorefining, large lake research, etc.
- Strengthen academic and scholarly partnerships with the University of Minnesota Duluth



INITIATIVE:

Supporting Innovation

Researchers generate knowledge in many ways, including through discovery-based research, applied research, and teaching. Researchers share their knowledge with society through innovation, which creates value from knowledge. Innovation can have commercial value through the development of start-up companies, licenses, or patents. Innovation can also have social or cultural value when the products of research promote social justice or enhance people's lives and well-being. Lakehead University serves a unique role in our surrounding regions, and is committed to making a difference in our communities in Northwestern and Central Ontario through innovation that collaboratively develops understandings of social issues and inspires action for positive change. Lakehead

University's Strategic Plan also champions innovative learning experiences for students through partnership development with industry and government that help promote strong employment outcomes.

By disseminating knowledge to and working with industry and community partners, researchers at Lakehead significantly impact our surrounding communities while being mindful of sustainable and culturally appropriate practices. Lakehead University is a major driver of economic development in the surrounding regions. For example, the University offers a range of extension services through specialized laboratories, including Lakehead University's Centre for Analytical Services (LUCAS). The Faculty of Natural Resources

Management offers external services to aid the forestry industry. Additionally, Lakehead's research expertise has been accessed by environmental companies through the Environmental Laboratory and Aquatic Toxicology Research Centre and the agricultural community through the Lakehead University Agricultural Research Station. Training and specialized testing services have been offered through the Paleo-DNA Laboratory for a number of years. The Geology department's lapidary facility has been providing services to the local mining and exploration industry for close to 30 years. Researchers at Lakehead Orillia are engaged in research projects with external partners through Interdisciplinary Studies and Sustainability Sciences.

WHERE DO WE WANT TO BE IN FIVE YEARS?

Lakehead University will be a leader in innovation in Northwestern Ontario and Simcoe County. *Ingenuity*, Lakehead's student business incubator space, will foster a thriving community of entrepreneurial thinkers, resulting in new businesses and jobs for people in our region. Students at Lakehead University are the next generation of entrepreneurs and innovators. Through *Ingenuity*, students will have the infrastructure and resources they need to take their ideas from ideation to innovation. Partnerships with industries in support of research and training will increase. Lakehead University will be known for facilitating social entrepreneurship and social innovation initiatives that will benefit and lead to positive social and environmental changes in communities. We will engage the creativity of all sectors, bringing many perspectives and different resources together to solve problems.

Lakehead University will be an active member in innovation clusters in Northwestern Ontario and Simcoe County that drive economic growth. We will partner with Indigenous communities to support culturally appropriate innovation and economic development. We will work with local partners to help develop economic opportunities that enable international students to remain in our communities after graduation.

STRATEGIES

- Work with Lakehead University alumni and local economic development corporations in Northwestern Ontario and Simcoe County to establish partnerships that will increase economic activity in the surrounding regions
- Enhance social innovation in our communities, including First Nations communities, by facilitating partnerships between academic, not-for-profit, private sector, municipalities and other government sectors
- Host a "Social Innovation Challenge" for faculty, students and community organizations that inspires local social innovators to collaborate and launch their social ideas to contribute to a better world

- Coordinate efforts with other institutions to support patents and commercialization
- Explore with community partners a collaborative start-up fund to help new graduates launch their business ideas
- Actively partner in innovation clusters such as the Pan-Northern Mining Research Alliance
- Work with college partners to develop programs that increase joint innovation initiatives, including social innovation
- Work with Indigenous economic development corporations, including the Nishnawbe Aski Development Fund, Canadian Council for Aboriginal Businesses, and others to develop innovation and economic opportunities for Indigenous learners and communities
- Explore with community partners the feasibility of establishing a Research Park at Lakehead University
- Create a regional entrepreneurial ecosystem to support and develop a network of resources available for student start-ups
- Design and launch *Ingenuity's* accelerator program, which will launch businesses within 12-16 weeks
- Implement for-credit course programming that enables students to work on their businesses as part of their academic programs
- Create an on-campus sustainable social enterprise that provides work and income for students and solutions to social issues
- Develop pathways for industries to access *Ingenuity* participants to provide feedback and business solutions to industry problems

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