

Laurentian University Strategic Research Plan 2012-2017

PREAMBLE

Laurentian University is the principal research and graduate training centre in Northeastern Ontario. In just 50 years, it has grown from a small undergraduate university to a mid-size comprehensive institution with increasing research intensity serving the entire Northeastern Ontario region and Simcoe County. It has thrived and developed in a resource-based region of Ontario that produces most of Ontario's metal exports (90%). As well, the region is home to the highest concentration of Francophone and 40% of the province's Aboriginal population. The region is now facing massive impacts from climate change and large scale development pressure induced by the global resource boom. All these elements are fundamental to Laurentian University's research endeavours. Within this context, the **Strategic Research Plan (SRP)** aligns itself to the University's 2012-2017 Strategic Plan and embraces its purpose statement, value, aspirations and associated results.

RESEARCH VALUES:

- Intellectual impact: the pursuit of excellence in all forms of research based on the highest standards of the peer-reviewed process
- Engagement: the involvement of faculty, students, Federated University partners, and the community at all levels as an integral part of the research enterprise
- Mnaddendmiwin (Respect) and Inclusivity: the importance of valuing Indigenous knowledge and the importance of supporting outstanding research in all fields
- Interdisciplinarity: the ability to create synergies between disciplines to foster innovative research
- Research integrity: the commitment to creating an environment that promotes responsible conduct by embracing standards of excellence, trustworthiness, and ethical practices
- Dissemination and knowledge translation: the exchange and synthesis of knowledge to address the gap between the large volume of research data and its systematic review and implementation in the academic and non-academic outlets

STRATEGIC RESEARCH THEMES:

All faculty research is valued and important to the overall mission of Laurentian. We aspire to be known nationally for our world-class expertise in stressed watershed systems; genomics and bioinformatics; applied evolutionary ecology; rural and northern children's health; multicultural sport and physical activity; environment, culture and values; mining innovation and exploration; nanotechnology and particle astrophysics. To facilitate and encourage initiatives and new collaborations within these areas of research excellence, Laurentian University has identified five strategic research themes:

1. Environment and Conservation, 2. Health and Wellness, 3. Social and Cultural Research and Creativity, 4. Engineering, Mineral and Material Sciences, 5. Subatomic Physics – SNOLAB.

Research at Laurentian is integrative and often spans several themes.

1. Environment and Conservation

Since its creation, Laurentian University has been recognized worldwide for its environmental research especially in the areas related to the restoration of industrially damaged aquatic and terrestrial ecosystems. The recent construction of the 'Vale Living with Lakes Centre' (VLWLC), a state-of-the-art facility is also a testament of the importance of this research field and the need to expand this work. The involvement of Laurentian in environmental research is ensured by several undergraduate and graduate programs. In addition the University has established three Canada Research Chairs (Stressed Aquatic Systems, Genomics and Bioinformatics and Applied Evolutionary Ecology) whose domains intersect.

We aspire to be known nationally for our world-class expertise in freshwater ecology/ environmental restoration. To achieve this aspiration by 2017, we will focus on the following:

- Establishing a new NSERC Canada Research Chair Tier II in Environmental Microbiology
- Establishing a Canada Excellence Research Chair in Northern Watershed Processes and Policies
- Focusing on aquatic sciences including addressing a diversity of aquatic organisms from fish and amphibians through to invertebrates, microbes and plants through the development of the Vale Living with Lakes Centre
- Attracting an increasing number of international researchers and graduate students to the new Vale Living with Lakes Centre through scholar-in-residence initiatives and conferences
- Fostering environmental science in support of First Nations land use planning activities in northern communities

2. Health and Wellness

Research in health and wellness at Laurentian University has been expressed in a variety of scientific endeavours, from basic science projects that investigate the bio-molecular basis of disease to participatory action research focused on promoting wellness. Other foci within this theme have included: work in bioethics and critical disability studies, exploration of determinants of health, understanding the intricacies of health services and health policy, and generating evidence to guide practices that will improve health outcomes. Some of the research centres that contribute to this theme: Centre for Rural and Northern Health Research (CRaNHR), Centre for Research in Human Development (CRHD), Centre for Research in Occupational Health and Safety (CROSH), and the recently established Centre for Evaluating Children's Health Outcomes (ECHO). The Canada Research Chair's Program (CRC) currently funds a chair in Rural and Northern Children's Health. Several MSc and two PhD programs

(Rural and Northern Health and Bio-molecular Science) are devoted to the growth of interdisciplinary health research at Laurentian.

We aspire to be recognized internationally for our expertise in rural and northern health and human kinetics. To achieve this aspiration by 2017, we will focus on the following:

- Creating the Sudbury Coalition for Health Research (SCHeR), a coalition between Laurentian University, the Northern Ontario School of Medicine (NOSM), the new Advanced Medical Research Institute of Canada, Cambrian College, Collège Boréal and other organizations in Sudbury involved in health research
- Creating a research Chair in Occupational Health and Safety (OHS) in collaboration with CROSH
- Pursuing actively the creation of a new chair under this theme
- Establishing the Heart and Stroke Foundation Chair in Aboriginal and Rural Health in collaboration with NOSM
- Providing the needed space, infrastructure, and administration to support CROSH and ECHO
- Expanding the animal research facility to meet expected demand
- Reinforcing cross cultural research with a focus on Francophone and Aboriginal health

3. Social and Cultural Research and Creativity

Social and Cultural Research and Creativity at Laurentian University is sustained by nine interdisciplinary research centres, three scientific journals (Nouvelles Perspectives en Sciences Sociales, Revue du Nouvel-Ontario, Reflets), one monograph series (Human Sciences Monograph Series), the English Arts Society's publication Sulphur, several masters programs spanning four Faculties, and one PhD program focusing on Interdisciplinary, Culture, and Society. Laurentian University is also home to two CRCs: one in Multicultural Sport and Physical Activity, the other in Environment, Culture and Values. The University has a particularly strong record in studies relating to education and Franco-Ontarian Studies and a commitment to developing Indigenous Studies and research in the social science and humanities. A strong cadre of faculty in various departments already focuses its research on the evolution and development of various aspects of Northern Ontario. Spanning faculties and departments, research activities in this area involve the study of art, culture, heritage, and applied and practitioner based work.

Building on these assets, Laurentian University will encourage research and research collaborations, especially those that contribute directly or indirectly to regional linguistic, cultural, social, educational and economic development.

To achieve this aspiration by 2017, we will focus on the following:

- Reviewing the strengths of the research centres associated with this theme
- Support graduate programs specializing in social research, especially those with a regional component

- Funding three research chairs: a Research Chair in Sustainable Northern Economic Development, a Research Chair in Franco-Ontarian History/Studies and a Research Chair in Indigenous Relations and Governance
- Increasing the number of research grants in social sciences and humanities and the amount received by at least 25%

4. Engineering, Mineral and Materials Sciences

Laurentian University is located in the Sudbury Basin, a globally significant Ni-(Cu-PGE) mining centre near other significant mining centres (Au, Zn-Pb-Cu, U). During the past two decades Laurentian University has taken advantage of its location to develop internationally-recognized educational programs in Earth Sciences and Engineering that focus on mineral exploration and aspects of mine-related engineering. A doctoral program in materials science was launched in 2010 and the University has established a Canada Research Chair Tier II in Polymer Nanomaterials. Laurentian is well poised to develop new knowledge in the earth and material sciences needed to make the transition to a more sustainable use of planetary resources. With the steady development of the graduate programs in Engineering (MSc and PhD in Natural Resources Engineering) and its three Research Chairs, the Bharti School of Engineering has reached a high level of competence and research expertise in the fields of (a) Mining Engineering, (b) Robotics, Automation and Advanced Technologies, and (c) Process Engineering.

Building on these assets, Laurentian University will encourage research and research collaborations, especially those that bridge the traditional disciplines in Earth Sciences and Engineering with other programs (economics, health, environment, Aboriginal, law). To achieve this aspiration by 2017, we will focus on the following:

- Establishing a new NSERC Canada Research Chair Tier II in Geochemistry
- The Mineral Exploration Research Centre will secure funding for the flagship exploration research project of the Canadian Mining Innovation Council's on 'Multidisciplinarity Integrated Footprints of Magnetic, Hydrothermal, and Basinal Ore Deposits'

5. Subatomic Physics - SNOLAB

Canada's contribution to Underground Science infrastructure is SNOLAB, the superlative-defying 2km deep underground facility situated at the Vale Creighton mine, near Sudbury. Since the early days of the formation of the SNO Collaboration, Laurentian University has been a growing force in the scientific output of the laboratory. A founding member of both SNO and SNOLAB, Laurentian's commitment to subatomic physics research has gone from one faculty member to presently five faculty- including a CRC Tier II, five adjunct faculty (SNOLAB Research Scientists), and five postdoctoral fellows. Assisted by students and approximately \$1M per year from NSERC, these 15 Laurentian scientists currently play key or leading roles in five experiments that span the full range of Underground Science.

Having grown together for 25 years Laurentian University and SNOLAB will continue to support each other and prosper from this close relationship. To achieve this aspiration by 2017, we will focus on the following:

- Continuing to be a sought-after partner in future international collaborations, able to provide expertise in all aspects of the experiments from on-site operations and management, through data collection and interpretation.
- Continuing to attract high-profile research and researchers to Sudbury, thereby providing a stimulating academic environment, both in terms of collaborative opportunities and unparalleled supporting infrastructure.

In summary, our high profile in these broad areas of research is evidenced by an excellent record of scholarly publications, substantial research funding and collaborations with the private sector and government agencies.

Strategy:

Led by the Vice-President, Francophone Affairs, Research and Graduate Studies and (VPFARGS), Laurentian has embarked on an ambitious process to increase research capacity and develop new strategic research avenues. Working in conjunction with all Faculties, Laurentian's Federated partners as well as the Provost, the Office of the VPFARGS is committed to raise the total annual research income to \$30 M by 2017 and to showcase nationally our exceptional research. In order to meet those goals the Office of the VPFARGS will:

- Support emerging and experienced research scholars through offering legal advice, mentoring, grant writing assistance and by extending a well organized system of review of ethical and animal research protocols
- Create new internal funding envelopes to support emerging scholars, create new research chairs and promote multidisciplinary and partnership
- Seek framework agreements with federated partners to facilitate their full participation in graduate research and funded research
- Locate and assist in obtaining funds from diverse sources including that of the Tri-Council agencies
- Increase research capacity in Simcoe County
- Enhance travel supports to faculty and graduate students giving peer-reviewed papers at international and national conferences
- Implement scholars-in-residence programs
- Establish a policy for Research Centres and Institutes to enable the leveraging of new opportunities and external funding in response to changing circumstances
- Develop a University Analytical Services Unit to centralize acquired equipment
- As an indication of its commitment to targeted research areas, the University will endeavour to create endowments for research chairs, and post-doctoral and graduate fellowships
- Encourage coordinated action by teaching centres and committees in the Laurentian federation to support student learning through undergraduate research