

Strategic Research and Innovation Plan (SRIP)

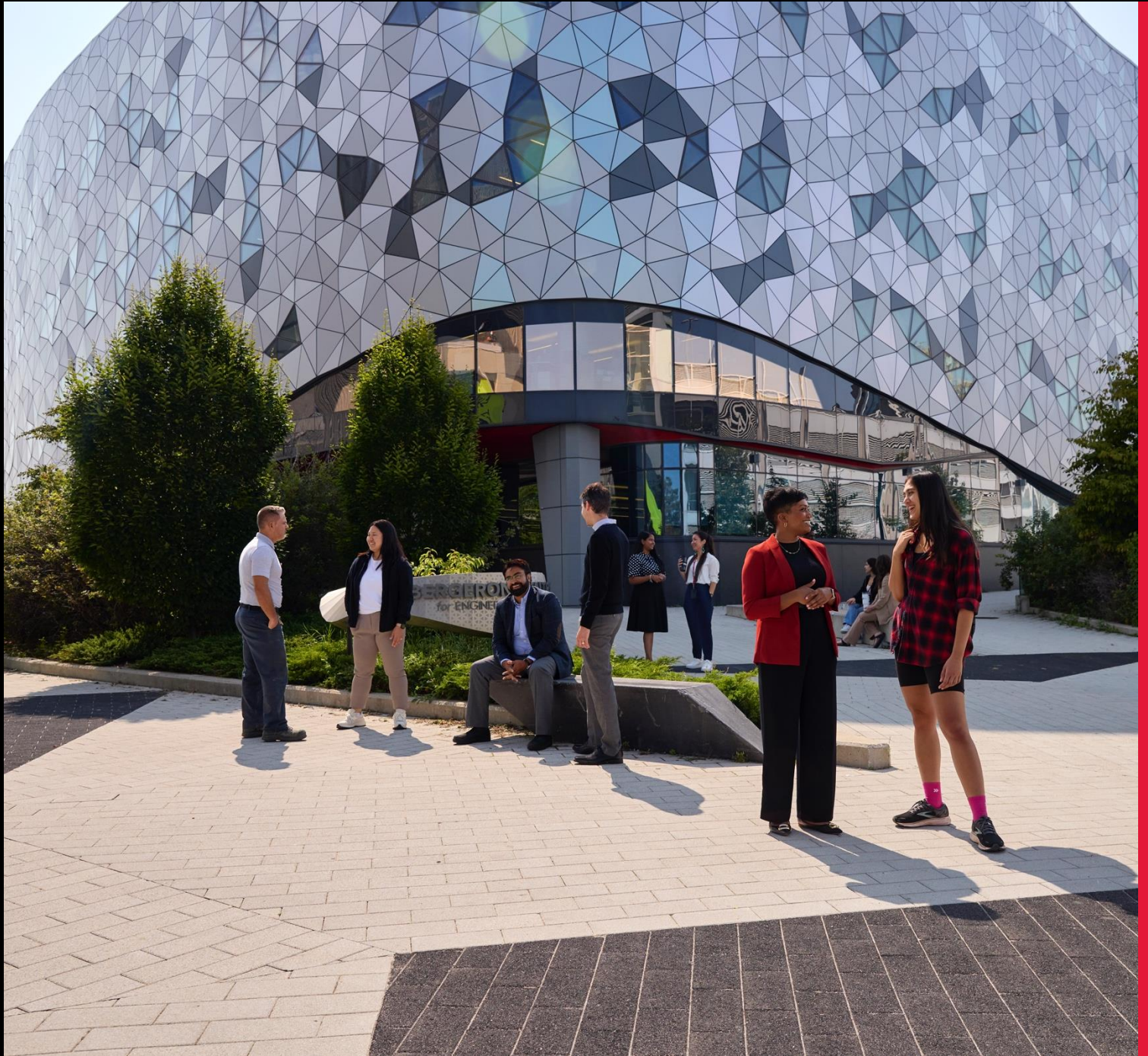


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1.0 Introduction

At the Lassonde School of Engineering, research and innovation are at the heart of who we are. This Strategic Research and Innovation Plan (SRIP) highlights our values and our strengths (including established and new/growing expertise) and outlines why we do the work we do, what we want to achieve, and how we will get there. This SRIP sets out our direction for the years ahead and is our roadmap for growing impact, guiding decisions, and ensuring that our efforts align with the priorities of our community, our partners, and society at large.

We are still a relatively young engineering and science school, launched just over a decade ago in 2013. That makes this an exciting moment. We have the energy and flexibility of a new institution, while also building on strong foundations: long-standing research strengths in computer science, electrical engineering, and earth and space science. Since then, we've expanded into civil and mechanical engineering, creating new opportunities for collaboration across York and beyond.

Being part of York University — a large, comprehensive university with deep expertise in the humanities and social sciences — gives us something rare: the chance to weave human perspectives and social impact into our research from the very beginning. We also benefit from our location in the Greater Toronto Area, surrounded by world-class universities, diverse communities, and entrepreneurial talent, with access to global networks that connect us across borders.

In just over 10 years, Lassonde has grown to four departments, 14 undergraduate programs, seven graduate programs, and four Organized Research Units (ORUs). Our researchers are advancing discoveries in cutting-edge facilities such as the Canadian Planetary Simulator, [York Microfabrication Facility](#), [High Bay Lab](#), [Climate-Data-Driven Design \(CD3\) Facility](#), and our new High-Performance Computing GPU Cluster. Together, these spaces allow us to attract talent, collaborate with partners, and tackle the world's most pressing challenges.

This plan is about more than listing facilities and programs. It's about setting a vision for how Lassonde will grow its research enterprise — building on our strengths, reaching into new and emerging areas, and ensuring that everything we do is driven by creativity, interdisciplinarity, and a commitment to improving life for people and communities, locally and globally.

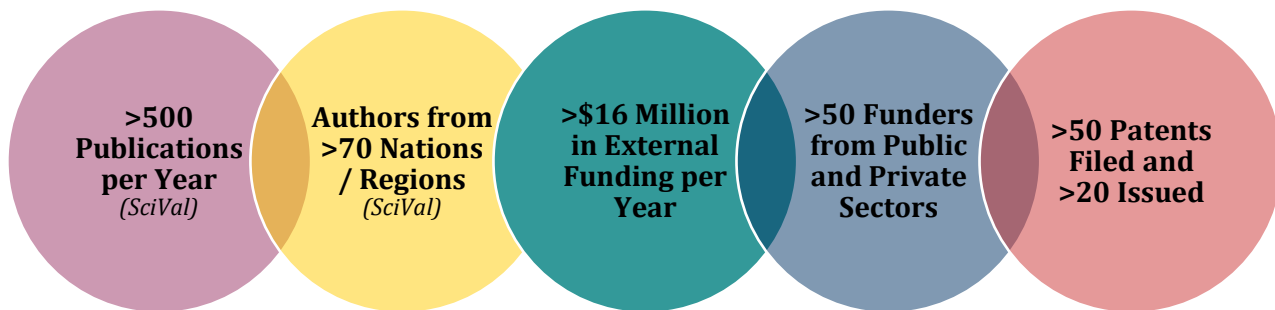


Figure 1: Lassonde Stats (data from 2020-2025)

2.0 Mission & Vision

Mission: To nurture and empower our community of diverse interdisciplinary creators by fostering creativity and innovation and providing a transformative education along with research and lifelong learning opportunities aimed at cultivating new ideas, knowledge, and contributing towards a more sustainable world for all.

Vision: To be recognized among the world's best interdisciplinary engineering schools, a home where engineers and scientists collaborate to improve the world for everyone.

3.0 Dean's Message

At the Lassonde School of Engineering, we share a bold vision: to be recognized among the world's best interdisciplinary engineering schools, where engineers and scientists collaborate to improve the world for everyone. This Strategic Research and Innovation Plan (SRIP) reflects our roadmap for how we'll get there — and more importantly, how you can be part of it. If you're a faculty member or researcher, this plan highlights the opportunities, supports, and partnerships available to help your work reach new audiences and create greater impact. For our industry, government, and community partners, it's a window into how collaboration with Lassonde can spark innovation, translate research into real-world solutions, and provide access to the next generation of talent. And for those considering joining us, it's an invitation to see the kind of ambitious, interdisciplinary research culture you could be part of.

Our strength lies in our ability to connect — across disciplines, across sectors, and across borders. Partnerships are central to this mission. They enable us to co-create solutions to pressing challenges, foster innovation, and ensure that research at Lassonde is relevant and impactful. These collaborations also give our students invaluable experiential learning opportunities, preparing them to lead in a rapidly evolving world.

Research visibility is another cornerstone of this plan. Sharing our work widely — through publications, conferences, media, and community engagement — ensures that our discoveries don't just sit on shelves but influence policy, inspire others, and shape the future. Our Research Support Office, communications team, and institutional partners play a vital role in amplifying that visibility.

At Lassonde, students are at the heart of our research enterprise. From undergraduate research awards to graduate training programs integrated with industry, we are committed to mentorship, opportunity, and inclusion. We want every student — regardless of background — to have access to the tools, networks and support they need to succeed.

Of course, research excellence is our foundation. You'll see it in the quality of our publications, the competitiveness of our grants, the calibre of our partnerships, and the world-class facilities that facilitate our work. From the Canadian Planetary Simulator to our High-Performance Computing Cluster, our infrastructure supports cutting-edge research across a wide range of fields. Our five strategic research themes — spanning manufacturing, AI, space, health, and foundational sciences — position Lassonde to lead in areas of national and global importance.

As you read through this plan, I encourage you to think about how it connects to your own goals and how we might work together. The SRIP is more than a document — it's a shared promise to push boundaries, challenge conventions, and engineer a better future, together.

Jane Goodyer
Dean, Lassonde School of Engineering
York University

4.0 Core Values

Our core values cover the creation and dissemination of knowledge and our commitments to excellent mentorship and impactful service to the community/partners.

Knowledge Production & Mobilization

Our research connects directly to the UN Sustainable Development Goals, making sure our discoveries help solve real-world problems at home and around the globe. We prioritize disseminating and commercializing our research through academic publications, industry partnerships, community engagement, and entrepreneurship. This approach ensures our innovations drive societal progress, economic growth, and improved quality of life.

Actions:

- Join our colleagues across campus and beyond to not only increase interdisciplinarity across STEM fields but also to add humanist dimensions to ensure our work has the intended impact and thoughtfully considers the systems and communities we hope to benefit.
- Work with offices on campus, such as Innovation York and York International, to encourage knowledge mobilization opportunities, such as patent filing, international collaboration, etc. Lassonde will continue to offer programs to get new ideas off the ground (e.g., Lassonde Innovation Fund).
- Encourage faculty to participate in their wider community (e.g., serve on editorial boards, host events, participate in societies, and serve on policy committees). Lassonde will look to provide support for these activities, for example, through our Stakeholder Development Fund.
- The Research Support Office (RSO) will continue to work with the faculty and other Lassonde/York offices (e.g., Communications, Libraries, OIPA) on research visibility. We will also continue to incentivize and celebrate success through programs like the Lassonde Innovation Awards.

Equity, Inclusion, & Innovation in Research

We foster a diverse and supportive research environment where students, faculty, and collaborators can thrive. Our research culture is intentionally inclusive, ensuring equitable access to resources, infrastructure, and opportunities for participation at all levels. We are committed to respectful engagement with Indigenous communities and to supporting research that recognizes Indigenous knowledge systems, addresses community priorities, and contributes to reconciliation. By nurturing talent, supporting collaboration, and encouraging creativity, we aim to build a research community that values diversity, drives innovation, and prepares future leaders to tackle complex problems with confidence and competence.

Actions:

- Lassonde will continue to provide resources to support our researchers in line with EDI principles. For example, using the EDI Seed Fund to support work/life balance for faculty members with family responsibilities, unique life events, and exceptional caregiving situations.

- Our researchers work to provide the best learning environment for our students and postdoctoral fellows/visitors. The Dean's Office will collaborate with researchers to showcase our training environment and secure grants that will provide more opportunities for learners, such as NSERC CREATE, Mitacs, and NSERC Alliance grants. Each year, the CREATE programs at Lassonde host a joint conference for enrolled students. In 2025, all undergraduate students enrolled in the Lassonde Undergraduate Research Award (LURA) program were invited to attend, providing an opportunity for a broad set of undergraduate students to be exposed to a high-calibre conference.
- Our faculty are encouraged to collaborate with Lassonde's [k2i \(kindergarten to industry\) academy](#) or other organizations to benefit the wider community. The k2i academy seeks to break down barriers to STEM in the K-12 system, empowering future engineers and scientists. Each summer, high school students who have opted out of physics participate in a summer research program with Lassonde faculty advisors, while also earning a physics credit. Researchers who can include youth engagement in their research grants are able to work with the k2i academy to ensure maximum impact of their youth engagement activities.

Community & Partnerships

We work to build strong partnerships with industry, government, and community organizations to translate research into practical solutions. Our commitment to commercialization ensures that our innovations contribute to economic growth and societal well-being. Our partnerships with industry, government, and community organizations should address their unique challenges and, where possible, promote the development and commercialization of new technology. We believe in the principles of decolonization and respectful engagement with Indigenous communities, their knowledge, and traditions.

Actions:

- Lassonde will continue to work with partners across campus (e.g., ORUs, Faculties, Innovation York, [SmartTO](#), and York International) and externally (e.g., Ontario Centre of Innovation, industry leaders, and international academic visitors) to facilitate partnerships.
- Lassonde will work to increase ORU activities by providing support for coordinators.
- Through YSpace Lassonde and [York's YSpace Network](#), Lassonde will strengthen pathways for faculty-led research, graduate innovation, and industry-aligned commercialization.

5.0 Research Themes

Goals & Actions:

- Increase the number and longevity of meaningful partnerships (e.g., with industry, NGOs, and community groups) with tangible outcomes. Lassonde RSO will work with ORUs, other departments, and faculty to encourage and enable collaboration (e.g., by organizing events with current and prospective industry partners to facilitate collaboration with our faculty). Lassonde RSO has data on partnerships that can be enhanced and used to inform and measure success for this goal.
- Increase research visibility. Lassonde RSO will work with the communications team and others to track and promote outcomes and encourage faculty to act where possible, through public engagement, guest lectures at other institutions, or through activities in professional organizations, etc. Success in this goal can be inferred through, for example, reputation scores in university rankings and applications & enrolment numbers.
- Explore new research areas. Fundamental scientific exploration is important, and with each research theme, new branches are possible. Lassonde wants to enhance existing strengths but also encourage new ventures. Lassonde RSO is committed to working with faculty to support or find funding that accommodates this goal (e.g., internally through the Lassonde Innovation Fund and externally through programs like New Frontiers Research Fund – Exploration).
- Strengthening Lassonde’s research culture. We will encourage in-person research seminars, networking events, and conferences. We will also work on ways to engage undergraduate students in research earlier during their studies through a brand-new shadowing program. We encourage researchers and their students to engage in person with students participating in the program.

Lassonde’s strengths are many. We have divided them into five themes, each with subthemes, in which researchers from all four of our departments are working.

Theme 1: An Adaptive Future for Manufacturing, Mobility, & the Built Environment

This theme intersects with much of our daily lives and critical areas of national and global importance. Canada faces great challenges in these areas, and federal and provincial governments are investing to meet the challenges. We anticipate a wealth of funding opportunities, for example, through Tri-Council, Environment and Climate Change Canada, the Ontario Ministry of Transportation, Ontario Centres for Innovation, and Ontario Research Fund – Research Excellence. Horizon Europe also offers a number of calls for proposals in this area.

Sub Themes:

- 1) Affordable and Sustainable Housing
- 2) Smart Grids, Renewable Energy, Energy Conversion and Storage Technologies
- 3) Electrification, Low Carbon, and Green Technology
- 4) Smart Buildings and Infrastructure
- 5) Advanced Materials
- 6) Safe/Secure, Additive, and Autonomous Manufacturing, and Industry 4.0

- 7) Biomanufacturing
- 8) Indigenous and Community-Driven Solutions for Remote Areas

Theme 2: Human-Centered AI & Digital Transformation

The rapid proliferation of new technology, such as AI, requires research to understand and manage risk, safety, trust, equity, and how to best integrate into our everyday applications (e.g., telecommunications, transportation, infrastructure). As the world becomes more digital and connected, we expect to see continual investment into this theme through Tri-Council, the Canadian Institute for Advanced Research (CIFAR), the National Canadian Cybersecurity Consortium, Innovation, Science and Economic Development Canada (ISED), the Ontario Research Fund, the Ontario Centres for Innovation, the Ontario Vehicle Innovation Network (OVIN), and others. Horizon Europe also offers a number of calls for proposals in this area.

Sub Themes:

- 1) Autonomous Systems, Smart Transportation, and Smart Cities
- 2) Digital Twins and Simulation Technologies
- 3) Reputable AI and Automation for Mobility, Environment, Health, and Education
- 4) Smart Robotics
- 5) AI Safety, Risk Mitigation, Cybersecurity, and Trustworthy Computing
- 6) Generative AI and Synthetic Content Generation
- 7) Next-Generation Communication Networks
- 8) AI & Society, Digital Cultures, and Financial Technologies

Theme 3: Earth & Space Exploration, Sustainability, & Innovation

Climate and environmental challenges often require interdisciplinary and cross-sectoral approaches. The government is meeting this demand through the Tri-Council's New Frontiers in Research Fund (NFRF) as well as through special NSERC Alliance Missions calls. Environmental projects tend to fit the scope of the NSERC Alliance Society grants. The Canadian Space Agency (CSA) is a long-time funder of Lassonde space researchers; Environment and Climate Change Canada (ECCC) has funded several pollution-related projects. We expect that these funding opportunities will continue to be launched regularly. Horizon Europe also offers a number of calls for proposals in this area.

Sub Themes:

- 1) Environmental and Space Science
- 2) Space Systems, Robotics, and Cutting-Edge Technologies for Space Exploration
- 3) Advanced Materials for Aerospace and Space Exploration
- 4) Human Factors in Space and Aviation Technologies
- 5) Decarbonization and Environmental Intelligence for a Changing Climate
- 6) Water and Wastewater Management/Sustainability/Security
- 7) Sustainable Resource Extraction, Critical Mineral Recycling, and Waste Reduction
- 8) Mobility Innovation for a Net-Zero Future

Theme 4: The Future of Human Health & Well-Being

Canada is investing in digital health, aging-in-place technologies, and the integration of health data and robotics through the Tri-Council, Health Canada, and CIHR. The Ontario Centres for Innovation has launched a Life Sciences Innovation Fund and has dedicated business developers who connect Ontario SMEs to university researchers. Lassonde co-hosts two industry networking events for this program each year. With the Faculties of Science and Health, we leverage our expertise and host events for industry partners (active and prospective) to foster collaboration. York University is expected to open a School of Medicine in 2027. By building our portfolio in medical technologies and bioengineering, we will be ready to partner with researchers from the School of Medicine and apply for larger grants in the medical field, such as CIHR. Horizon Europe also offers a number of calls for proposals in this area.

Sub Themes:

- 1) Medical Robotics, Mobility, and Assistive Technologies
- 2) Digital Health and Telemedicine Innovations
- 3) Tissue Engineering and Regenerative Medicine
- 4) Predictive Diagnostics and Health Informatics for Personalized Medicine
- 5) Smart Wearables and Biosensors for Health Monitoring
- 6) Health Equity in Technological Innovations

Theme 5: Foundational Engineering, Computer, & Physical Sciences

Fundamental and foundational science (e.g., engineering, environmental and space science, and computer science) is an important and necessary segment of Lassonde's research. These core areas not only drive technological innovation and discovery but also provide the essential building blocks for interdisciplinary collaboration and applied research. By advancing knowledge in these foundational domains, Lassonde fosters a robust ecosystem for solving complex global challenges and preparing the next generation of researchers and innovators.

6.0 York & Lassonde Infrastructure Support the SRIP

[York University's Strategic Research Plan \(SRP\)](#) and Lassonde's Strategic Research and Innovation Plan (SRIP) are complementary, reflecting mutual support and agreement on values, research strengths, and future opportunities. York's SRP highlights strengths in advancing fundamental research, building healthy lives and communities, socially responsible innovation, and more. Research opportunities include digital cultures and disruptive technologies, climate and sustainability, and inter/transdisciplinary research. Entrepreneurship, partnership, and commercialization are also covered in York's SRP. There are many centralized services, accessible to Lassonde, that enable the activities outlined in the SRP and SRIP, including, but not limited to, Innovation York (partnerships), [YSpace](#) (entrepreneurship), York International (international collaboration), the libraries (research visibility), and [ORUs](#) (inter/transdisciplinary partnership).

Housed within Lassonde are a variety of complementary and unique services (e.g., Lassonde RSO, [k2i Academy](#), communications team, etc.). We have our own ORUs – [Centre for Innovation in Computing at Lassonde \(IC@L\)](#); [Mobility Innovation Centre \(MOVE\)](#); [Manufacturing, Technology, and Entrepreneurship Centre \(MTEC\)](#); and [Centre for Research in Earth and Space Science \(CRESS\)](#). Each of these ORUs has a dedicated coordinator, providing administrative support that enables events, collaborations, and large-scale grant support. Lassonde is also highly involved with [Connected Minds](#), a York-Queens Canada First Research Excellence Fund (CFREF) program, which is at the intersection of social health and justice and disruptive new technologies. Many of our researchers are very involved in pan-university ORUs, most notably the [Centre for Vision Research \(CVR\)](#), one of the longest-standing ORUs at York, as well as the [Centre for Artificial Intelligence & Society \(CAIS\)](#), a more recent initiative. Researchers engaged in biomedical engineering as well as AI and Society work across disciplines, including researchers in law and social sciences.

Our researchers are leading NSERC CREATE programs – Smart Mobility Advanced Research and Training (SMART); [Geomagnetic Disturbance in Modern Societies and Technological Infrastructures \(GMD-MSTI\)](#); [Additive Manufacturing: Engineering Design and Global Entrepreneurship \(AM-EDGE\)](#); [Microsystems Technologies & Applications \(MTA\)](#); [Smart Autonomous Robotic Technology for Space Exploration \(SMART-ART\)](#); and [Training in Applied Biotechnology for Environmental Sustainability \(TABES\)](#). These programs provide enhanced graduate training in areas that are critical to industry and where there is a demand for talent with graduate degrees. Many of these programs are integrated with industry and provide internships for the students.

Key Lassonde facilities include the [High Bay Lab](#), [York MicroFabrication Facility \(YMF\)](#), [Climate-Data-Driven Design \(CD3\) Facility](#), Canadian Planetary Simulation Lab (CAPS), High Performance Computing Facility, and the York-wide [YSciCore](#) Facility. Partnerships with, for example, Venture Lab and OVIN's [SmartTO](#), provide researchers access to space and equipment they may not otherwise have, and opportunities to collaborate with Ontario Small- to Medium-Sized Enterprises (SMEs), municipalities, and Non-Governmental Organizations (NGOs).

Overall, York and Lassonde provide a rich environment for research, innovation, and collaboration across various fields, supported by a number of service-based departments, state-of-the-art facilities, and interdisciplinary centers. It is a priority for Lassonde staff to educate and inform researchers about institutional and faculty-based resources and support to encourage uptake and capitalize on the benefits that will drive the success of this SRIP.