

## John R. Evans Leaders Fund Backgrounder

### Ontario

The Canada Foundation for Innovation (CFI) Board of Directors approved a contribution of \$48,750,467 to support 166 infrastructure projects in the province.

Project Title	Maximum CFI Contribution
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#### **Brock University**

Exercise and environmental physiology laboratory	\$74,071
Cybersecurity and Critical Intelligent Infrastructure (C2I2) lab	\$46,310
<b>2 projects</b>	<b>\$120,381</b>

#### **Carleton University**

Upcycling plastic waste using yeast fermentation	\$100,000
Infrastructure to support a synthetic energetic materials laboratory	\$100,000
Student absenteeism and child mental health in the post-pandemic era	\$34,014
Sonic arts participation lab	\$50,581
Sensors for multi-scale laboratory experiments on soils	\$94,837
Lowering the burden: Identifying metabolic costs of stress to improve resilience	\$314,999
Inter-generational impact of maternal obesity on structure and function of skeletal muscle	\$96,462
Digital Workflows for Assessment of the Built Environment (DWABE)	\$322,038
Metal mobilization from thawing permafrost	\$150,000
<b>9 projects</b>	<b>\$1,262,931</b>

#### **Lakehead University**

Advancing Canadian built-environment sustainability and resiliency: A multiscale wind tunnel facility	\$176,000
<b>1 project</b>	<b>\$176,000</b>

#### **McMaster University**

The integrated AI-driven antibiotic discovery platform	\$205,048
Community-engaged laboratory for creative methodologies (Co-Create Lab)	\$137,986
Germline-somatic associations in cancer	\$211,754
McMaster aptamer laboratory	\$768,442

Thermal analyses of advanced high performance materials	\$180,000
Expansion and upgrade of McMaster Decision Science Laboratory (McDSL)	\$75,000
Advancing Canada's sustainable energy future through characterization of reactive fluid-rock interactions	\$127,500
Infrastructure for versatile integration of photonic materials and chips enabling their transition from lab to product	\$748,166
Observatory for social science, humanities and arts contribution to public and social sector innovation and impact	\$122,932
The study of microbiome-host interactions and development of therapies for chronic diseases.	\$776,560
Materials for Anchoring and Penetration Laboratory (MAPL)	\$83,500
<b>11 projects</b>	<b>\$3,436,888</b>

## Ontario College of Art and Design (OCAD University)

OCADU sustainable colour lab	\$73,873
Bio art and living materials lab	\$36,711
<b>2 projects</b>	<b>\$110,584</b>

## Queen's University

Advanced fault detection for software-controlled aerospace and automotive systems	\$90,000
Uncovering the temporal dynamics of selective attention	\$119,200
Towards sustainable open source software and developer productivity	\$90,000
Investigation of biomarkers and novel therapeutic targets in spondyloarthritis	\$100,000
<b>4 projects</b>	<b>\$399,200</b>

## Toronto Metropolitan University

Advanced co-operative mobile robotic manipulation test facility	\$76,000
Innovative waste-to-bioenergy technologies for Water Research for Resource Recovery (WR3) laboratory	\$76,000
Digitizing black history	\$76,000
Integrated solutions for PFAS removal in wastewater: Advanced materials, biological processes, and hybrid technologies	\$84,520
Quantum sensor for multi-cancer early diagnosis	\$395,000
<b>5 projects</b>	<b>\$707,520</b>

## Trent University

Environmental and bio-polymer materials characterization facility	\$149,049
A state of the art rodent suite to study skeletal muscle and adipose tissue physiology	\$99,104

Nitrogen in the environment: A delicate balance	\$135,338
Decoding sound: Using electroencephalography to explore hearing loss and communication	\$70,704
Integrative metabolic measures of temperature stress in mammals	\$83,593
<b>5 projects</b>	<b>\$537,788</b>

#### University of Guelph

Structure-guided development of oligonucleotides for biosensing and therapeutic applications	\$79,738
The effects of autonomic nervous activity on cerebral blood flow regulation in health and disease	\$80,532
Structural dynamics of deadenylases and nucleic acid clients	\$80,533
An integrated database for the 1931 census and linked sources	\$127,382
Antifungal resistance in dermatophytes: From genomics to clinical implications	\$78,413
Infrastructure for genetic engineering and high-content imaging in neurodevelopmental models	\$97,555
Environmental and evolutionary physiology of fish respiration	\$80,532
<b>7 projects</b>	<b>\$624,685</b>

#### University of Ontario Institute of Technology

Advanced performance testing platform for emerging vehicles in adverse weather	\$180,600
Supercharging the electrochemical materials lab	\$168,422
Advanced nanofabrication facility for quantum and energy materials research	\$135,000
Mobile and lab-based infrastructure to enable advanced proactive ergonomics analyses	\$176,252
<b>4 projects</b>	<b>\$660,274</b>

#### University of Ottawa

Electrochemical and thermochemical production and use of sustainable hydrogen	\$200,000
Developing, implementing, and evaluating advanced artificial intelligence models for health systems	\$264,436
Using stress physiology and behaviour to inform salmonid fisheries and aquaculture in Canada	\$359,700
Real-time monitoring of quantum molecular dynamics	\$484,999
Improving access to rehabilitation services for people living with complex rehabilitation needs using telerehabilitation	\$154,776
Evolving phage endolysins against multidrug-resistant bacteria	\$119,040
Investigating microbiome-driven health disorders in humans using the SHIME gut system	\$140,028
<b>7 projects</b>	<b>\$1,722,979</b>

### University of Toronto

Improving vaccine efficacy through novel antigen design and quantitative tools	\$150,000
Simulating Planets Like Earth: SimPLE Lab	\$164,000
LIFT-AI: Leveraging AI for transplant longevity or long-term survival	\$396,237
Isoform-resolution functional genomics in health and disease	\$249,980
Precision metrology with a continuously operating optical lattice clock	\$680,000
Physiology and mechanisms of stress in skeletal muscle and pancreatic islets	\$240,000
Integrated design for digital fabrication in mass timber engineering and construction	\$100,000
The role of extracellular vesicle (EV)-mediated crosstalk between cancer cells and platelets and in tumor progression	\$800,000
Hardware for advanced 7T imaging of the human brain	\$400,000
Synthetic biology-based micro/nanoscale sensing systems for antimicrobial resistance	\$165,000
Understanding mechanical force effects on immune cell biology	\$243,257
Water resources management from data to decisions	\$100,000
Decoding neural network dynamics driving relapse in opioid use disorder	\$454,409
Advanced driving simulation to support the safe and independent mobility of older adults	\$408,086
Community Design and Advocacy Space (CDAS) – Co-designing technologies to support marginalized workers	\$126,889
Investigating lifestyle and sex-specific factors in the incidence and progression of multiple sclerosis	\$358,562
Molecular and cellular determinants of memory function and dysfunction	\$752,368
Assimilation and un-assimilation: Indigeneity across the Canadian censuses from 1861 to the present	\$56,500
Biocultural Lab for the study of Inequality and Social Stress (BLISS)	\$100,000
From neurons to networks: Modelling functional and structural neurovascular dysfunction in Alzheimer's disease	\$697,437
Studying behavioural adaptations in parallel pathways of the visual system using expansion microscopy	\$162,500
Target validation for repeat expansion disorders	\$260,000
Physics constrained neural fields for scientific imaging	\$200,000
A closed-loop system for collaborative and continual development of large language models	\$250,000
INSPIRE Music Lab	\$400,000
Bridging the gap between human and artificial intelligence: Custom architectures for human-AI collaboration	\$96,000
Advanced instrumentation for revolutionizing northern human-environment coevolution	\$157,900
Structure guided engineering of cellular signalling	\$465,000

Advanced multifunctional powder synthesis, coating, component manufacturing, and material characterization facilities	\$800,000
Genome maintenance biology in cells and tissues	\$625,744
A Single-cell analysis lab to investigate the aging mechanisms of oligodendrocyte precursor cells	\$175,480
Elucidating the cellular and molecular mechanisms underlying cardiac tissue patterning and morphogenesis	\$360,000
Smart surfaces for building energy efficiency and carbon capture	\$400,000
Building a comprehensive understanding of urban environmental change: Infrastructure for interdisciplinary research	\$158,520
Understanding complex microbiomes using ultrahigh-throughput experimentation	\$156,404
Automated microbial isolation and characterization platform for microbiome-based therapeutics and bioprocesses	\$400,000
Elucidation of endothelial and epithelial functions in chronic disease using advanced light microscopy methods	\$556,956
Next generation platforms for immune-competent organoid models of human disease	\$762,062
Life course determinants of cardiovascular health: A comprehensive approach from preconception to childhood	\$195,000
Single-molecule imaging in cells and cellular assemblies	\$185,935
Advanced metabolomics for cancer therapy and metabolite discovery	\$800,000
Process intensification for electrochemical manufacturing	\$193,808
Chemical biology platform for drug discovery	\$720,020
The role of the microbiome in maternal and child health	\$693,034
Foundational world models and efficient reward learning for robotics	\$164,862
Creating inclusive play opportunities in pediatric healthcare environments	\$43,915
The chemical cognition lab: AI-driven tools and robotics for chemical innovation	\$164,862
Advanced analysis rock and mineral processing facility	\$159,983
Molecular to material scale characterization of protein assemblies	\$320,000
New building blocks and architectures to empower superconducting quantum computing	\$800,000
Hollow fiber membrane development for energy-efficient brine treatment	\$400,000
ZPEL: Innovating power conversion for a sustainable future	\$164,772
<b>52 projects</b>	<b>\$18,035,482</b>

## University of Waterloo

Understanding the basic biophysical mechanisms by which neuroinflammation leads to neurodegeneration	\$200,000
Superconducting millimeter-wave circuits for quantum applications	\$80,000

Mechanically crosslinked networks: Structure-property relationships and applications in batteries	\$109,000
Development of a modular biomechanics laboratory to quantify, assess, and (re)train movement from lab-to-clinic-to-field	\$110,000
Enriching the linguistic diversity of open language models	\$168,004
Socio-cognitive foundations of human-machine interactions	\$180,000
Progressive internalization of skills for advanced language model reasoning	\$96,000
Platform for advanced experiments with superconducting quantum devices	\$421,000
Rational design of sustainable and nano-enabled multiphase polymers	\$258,000
Reconfigurable converter platform for design, protection and control of modern power grids	\$154,204
High-speed and efficient integrated circuits for next generation computing systems	\$100,000
GPU accelerated numerical simulations for oceanographic applications	\$160,000
Serving systems for large language models with low latency, high utilization, good scalability, and low carbon emissions	\$195,069
Privacy-aware language agents via post-deployment learning and adaptation	\$80,000
Invisible threats, visible solutions: Advancing water quality management through micropollutant analysis	\$125,000
Atomic layer etcher for enhanced quantum technology devices	\$579,016
Architecture exploration and design tools for next-generation reconfigurable acceleration devices	\$80,000
Addressing urban (over)heating in a warming climate	\$78,000
Fast spectral imaging of fire emissions	\$125,000
Exploring many-body physics with language models	\$160,000
Digital infrastructure for motion capture	\$80,000
Feminist interdisciplinary research lab	\$105,000
Elevated- to high-rate characterization facility for advanced lightweight materials and structures	\$115,000
Framework for advancing aerosol metrics to improve air quality and health	\$95,000
Technologies enabling nature-inspired architected materials and structures	\$375,750
Raman spectroscopy for multidimensional and ultrasensitive chemical analysis of live biological subjects	\$100,000
<b>26 projects</b>	<b>\$4,329,043</b>

## University of Western Ontario (The)

Western accessible instruments lab	\$133,447
Emerging RNA viruses' impact on brain function	\$800,000
Sustainable resource management lab - tracking nutrients in the city	\$267,274
Advancing innovations in social communication in aging and dementia through technology-based outcomes and interventions	\$176,382

A pain research suite	\$260,549
Gas flux measurements to animate carbon and nitrogen cycling models	\$187,741
Consumer and Organizational Behaviour (COB) lab	\$42,152
Investigating the impact of cellular stress response pathways on whole-body metabolism	\$142,460
Non-invasive geophysical monitoring of geo-environmental processes	\$198,560
A fabrication and characterization platform for AI-driven design of personalized electronic skins	\$266,884
High resolution mass spectrometer for mapping host-microbe metabolism	\$307,799
The Fostering Resilience through Audiovisual Media and Engaged Scholarship (FRAMES) collaboration space	\$64,000
Reconfigurable intelligent surface empowered smart radio environment for AI-driven next generation wireless networks	\$235,359
Small-world systems for AI-enhanced analysis of naturalistic behaviour and underlying brain activity	\$316,160
<b>14 projects</b>	<b>\$3,398,767</b>

#### University of Windsor

Advanced characterization and development of new (bio)materials through x-ray scattering	\$150,000
Innovative platform for rapid and cost-effective biomolecular synthesis and characterization	\$137,000
Resilience and sustainability assessment of geotechnical infrastructure	\$76,699
Bioacoustics infrastructure for innovative field studies of ecology and conservation of migratory birds	\$75,001
<b>4 projects</b>	<b>\$438,700</b>

#### York University

Establishment of Health Equity and AI Lab (HEAL)	\$96,000
Futuristic infrastructures for AI framework: Pioneering self-healing cloud and smart cities	\$75,120
Walking while talking: Assessing the interplay between age, distraction, and mobility	\$72,422
Additive manufacturing for next generation space systems and robotics	\$144,632
A novel laboratory to investigate cardiorespiratory function and perceived dyspnea during physiological stress in humans	\$138,000
Interrogating plasticity of electro-chemical synapses using multiphoton imaging microscopy	\$200,000
Research infrastructure to initiate the York University community water hub	\$140,000
Molecular interactions and structures at solid/liquid interfaces for environmental applications	\$149,000





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A novel laboratory to study sarcopenia and the neuromuscular control of movement across the ageing spectrum	\$80,000
Neurodevelopmental-intervention testing suite to identify and prevent transdiagnostic risk for mental health challenges	\$120,000
Refugee law lab: Algorithmic justice for people on the move	\$23,963
Cortical networks for natural sensorimotor behaviours	\$200,000
Integrated platform for high resolution analyses of stem cells and tissues in response to metabolic pre-conditioning	\$100,000
<b>13 projects</b>	<b>\$1,539,137</b>

**NOTE:**

As part of this announcement, an additional \$11,250,108 was awarded under the Infrastructure Operating Fund (IOF), a mechanism that assists institutions with the incremental operating and maintenance costs associated with the new infrastructure.