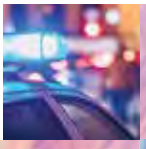
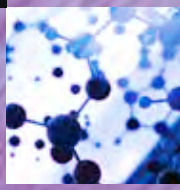
WILFRID LAURIER UNIVERSITY







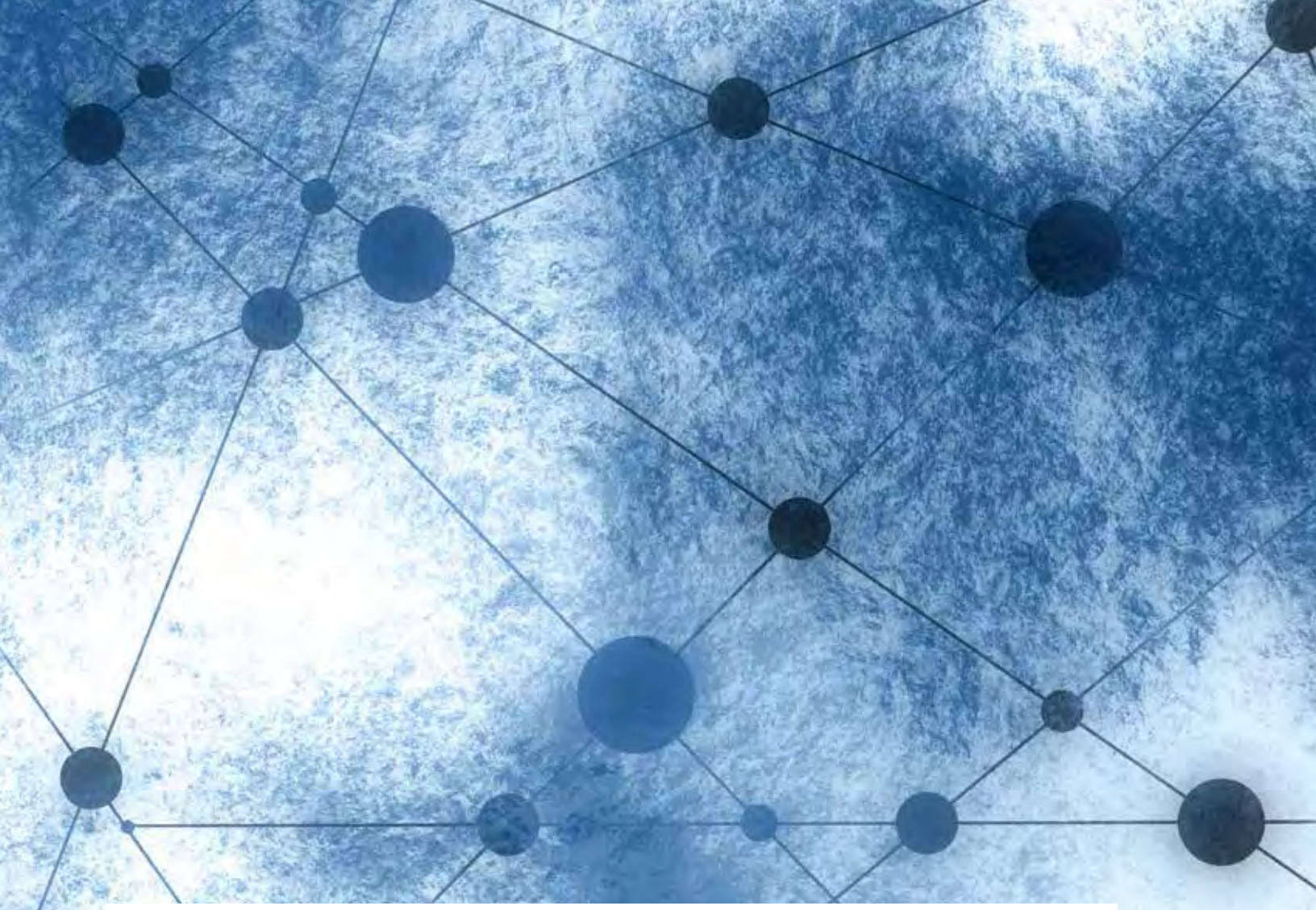




Impact Through Research & Innovation

Connecting Laurier Research to Community

Office of Research Services

ANNUAL REPORT 2017–2018



Laurier's Year of Growth and Excellence

RESEARCH AT LAURIER has experienced a remarkable year of growth and excellence. Our scholars have taken on the most significant environmental, humanitarian and social issues facing society today and our research findings have been recognized by citizens and scholars around the world. Over the past year, we saw teams of researchers tackle complex issues — climate change, the Ontario provincial election, literacy, global migration, human rights, and workplace diversity and harassment. The 2017-18 report focuses on the individuals who are dedicated to examining these issues and who have innovated and developed meaningful partnerships to ensure their work will have significant impacts on the communities we serve.

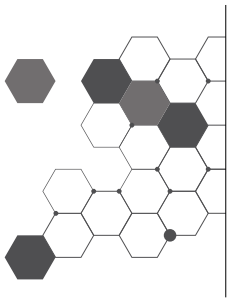
We are tremendously proud of our faculty members, students, postdoctoral fellows and research staff who have demonstrated exceptional commitment to their research programs and whose work is propelling the university forward. This report is a celebration of their research accomplishments and we look forward to what promises to be a successful year ahead.

Jeffery A. Jones
Interim Associate Vice-President: Research

RESEARCH HIGHLIGHTS

$14.1 M
IN NEW RESEARCH FUNDING

553 full-time faculty



#1 RESEARCH-GROWTH UNIVERSITY *in its category*

—TOP 50 RESEARCH UNIVERSITY RANKING, RE$EARCH INFOSOURCE, *2017*

60%
SUCCESS
in SSHRC Partnership Development grants

7%
increase in federal funding over 2016-17

12%
increase in Tri-Council funding over 2016-17

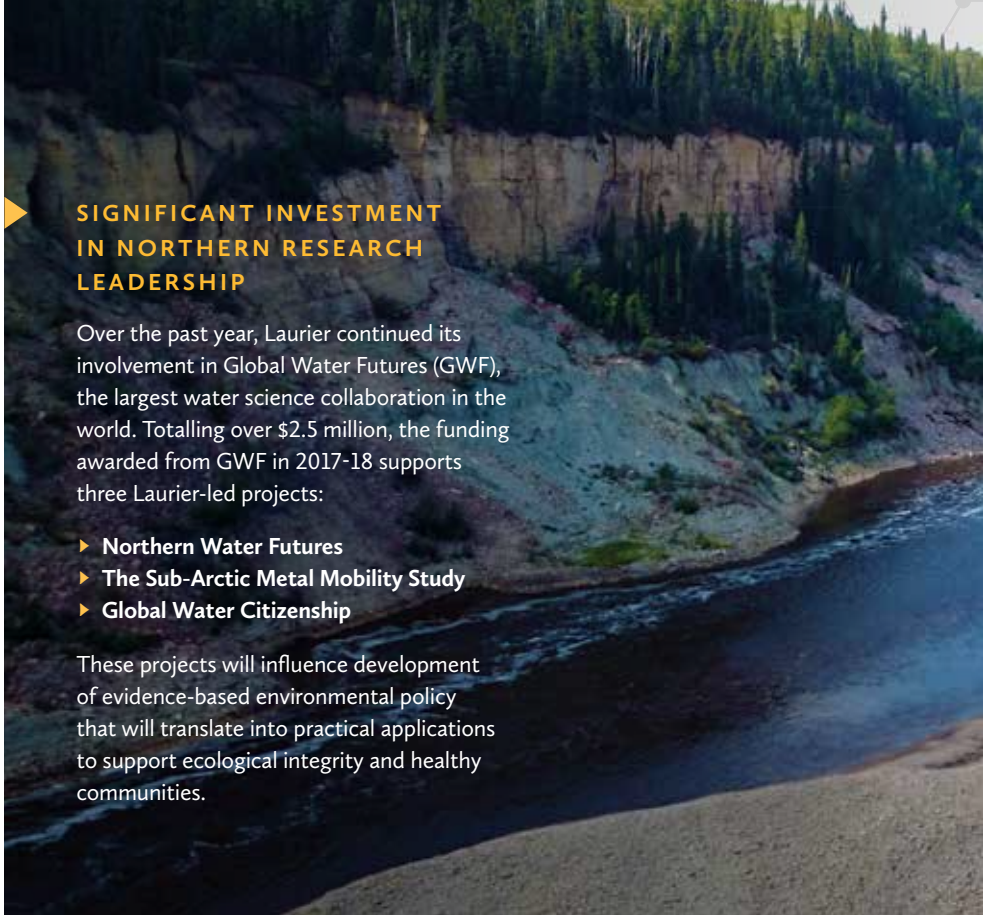
75% SUCCESS
in NSERC Discovery competition

58% SUCCESS
in SSHRC Insight Development grants

A northern undertaking

CATALYST FOR COLLABORATIVE RESEARCH

CLIMATE CHANGE IS THREATENING Canada's North. Northern communities in Canada are facing challenges to their deep-rooted social, economic and cultural vibrancy, which is highly interwoven with the existence of healthy ecosystems. Laurier is working to address these challenges through its long-standing partnership with the Government of the Northwest Territories (NWT).
In September 2017, Laurier strengthened its commitment to the NWT by opening a research office in Yellowknife. The office serves as a base for Laurier's research activities in the North and for liaising with partners, including government and Indigenous communities. The office is home to year-round staff, primarily research associates and postdoctoral fellows, and provides workspace to visiting faculty, students and staff. This permanent presence in the NWT significantly enhances Laurier's capacity to build on its national and international leadership in cold regions research.



SIGNIFICANT INVESTMENT IN NORTHERN RESEARCH LEADERSHIP

Over the past year, Laurier continued its involvement in Global Water Futures (GWF), the largest water science collaboration in the world. Totalling over $2.5 million, the funding awarded from GWF in 2017-18 supports three Laurier-led projects:

- **Northern Water Futures**
- **The Sub-Arctic Metal Mobility Study**
- **Global Water Citizenship**

These projects will influence development of evidence-based environmental policy that will translate into practical applications to support ecological integrity and healthy communities.

Collaborating for community solutions

JENNIFER BALTZER (Biology) leads the *Northern Water Futures (NWF)* project, a direct response to water security challenges posed by climate change in the North. NWF is a NWT-focused consortium of knowledge producers, mobilizers and users from communities, government, industry, non-governmental organizations and universities. The project sees researchers and stakeholders working collaboratively to understand, predict and address the impacts of climate change and resource development on shared water resources across the NWT. The project, which received $2 million in funding from GWF, is supporting adaptation solutions in the North through community- and field-based research across the NWT, and the associated development of decision support tools.

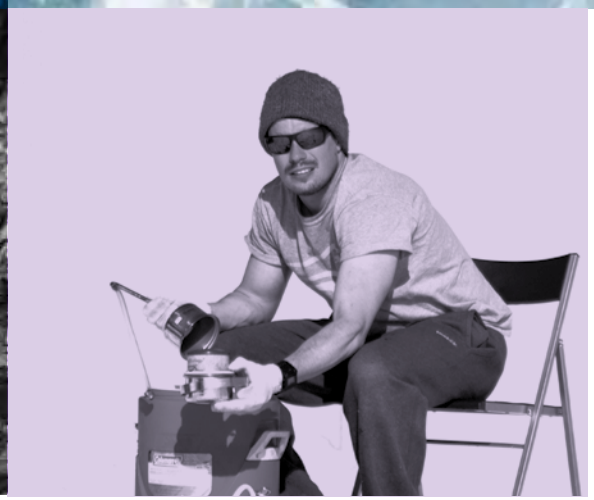
Linking citizen data with environmental science in northern Canada

LED BY COLIN ROBERTSON (Geography and Environmental Studies), the *Global Water Citizenship* project aims to identify, develop and evaluate new tools and strategies to enable community monitoring of freshwater to enhance community resilience and adaptation, and contribute to scientific understanding of how these systems are changing. The project will build the technical and social infrastructure to support information exchange among local communities, scientists and local decision-makers in northern Canada. While participating in existing monitoring networks, Robertson and his team will also look at new tools for data quality and validation to leverage community observations for environmental change in Canada's cold regions.

Tracing mining pollution

THE SUB-ARCTIC METAL MOBILITY STUDY (SAMMS) undertakes a mix of field, laboratory and modelling studies to understand how pollutants from mining activity may move through the landscape, potentially affecting drinking water quality and aquatic organisms in negative ways. Led by **BRENT WOLFE** (Geography and Environmental Studies) and **JASON VENKITESWARAN** (Geography and Environmental Studies), the research traces the transport and behaviour of dissolved organic matter and metals along the 200 kilometres between Giant Mine and Whatì in the NWT. SAMMS builds upon previous research in the Slave River Delta, where high concentrations of arsenic were discovered in lake sediments corresponding to when emissions from Giant Mine were greatest.

LEADING CANADA'S NORTH



RYAN CONNON leads the new Yellowknife research office. He was born for the job. Literally. Connon was born in the community of Edzo, now named Behchokò, about 80 kilometres northwest of Yellowknife. Part of Laurier's growing team of northern-focused researchers, Connon is a senior research associate in hydrometeorology. Connon is based in Yellowknife full time, allowing for year-round fieldwork, deeper relationship building capacity with local partners and facilitating the work of colleagues based in the south.

Conducting research in her home territory is what drives **STEPHANIE PIKE**, a master's student in the Environmental Studies program. Pike was awarded a POLAR Northern Resident Scholarship, an award that recognizes the work of long-standing residents of the North. Pike was born and raised in Whitehorse, Yukon, where she currently lives. Working with Scott Slocombe (Geography and Environmental Studies), Pike's research identifies and assesses policies, plans and processes in place for reducing the impacts of environmental hazards in Yukon communities and the adjacent ecosystems and wildlife they depend on. Pike will connect hazard-mapping research to community needs and opportunities for adaptation and mitigation to help with both development of and adaptation to future land and ecosystem changes.

EVAN WILCOX is dedicated to examining the hydrological variability of lakes in the western Arctic. Wilcox, a Laurier graduate student in the PhD Geography program, received the W. Garfield Weston Award for Northern Research at the master's level from the Association of Canadian Universities for Northern Studies. Under the direction of Philip Marsh (Geography and Environmental Studies), Wilcox examines how permafrost-controlled lakes in the Inuvik and Tuktoyaktuk regions vary in their behaviour according to landscape characteristics.

KELLY MUNKITTRICK (Biology) was named the inaugural executive director of Laurier's cold regions and water initiatives. A high-profile aquatic ecosystem expert, Munkittrick advances research initiatives, student training opportunities and knowledge mobilization in support of Laurier's growing commitment to cold regions and water science leadership. He also focuses on advancing Laurier's partnership with the Government of the Northwest Territories, Laurier's role within the Global Water Futures program and other cold regions and water science initiatives throughout the university.

Improving the lives of Canadians

LAURIER RESEARCHERS DEMONSTRATE COMMUNITY IMPACT THROUGH RESEARCH PROGRAMS DEDICATED TO PUBLIC SAFETY

Uncovering the mental health of first responders

Canada's public safety personnel—correctional officers, dispatchers, firefighters, paramedics and police officers — are a critical component of society. But we know very little about what mental health disorders they face and what support they need. Because of this, **RENÉE MACPHEE** (Kinesiology and Physical Education) is helping to lead a new national network, The Canadian Institute for Public Safety Research and Treatment (CIPSRT), to work on improving the mental health of Canada's public safety personnel. MacPhee is an associate director and leads the institute's work on paramedics — a group of approximately 38,000 individuals in Canada.

Understanding experiences of women police officers

Women in policing, particularly mothers, still face a "boys' club" that puts significant stress on them, both at work and at home. It even affects how police officers who are mothers parent their children. These findings are the result of years of research by **DEBRA LANGAN** → (Criminology) and **CARRIE SANDERS** ↓ (Criminology), along with their former sociology master's student, Tricia Agocs. Langan and Sanders, with research assistant Julie Gouweloos, are now continuing broader work on gender and policing, focusing on the recruitment, retention and promotion of women officers and the development of policies to address challenges in these areas. They will present findings to nationwide police organizations with the goal of improving organizational structures and occupational cultures to support women officers. Their research has been in high demand, both from women officers who want to be interviewed and from police services looking to improve their policies and practices.

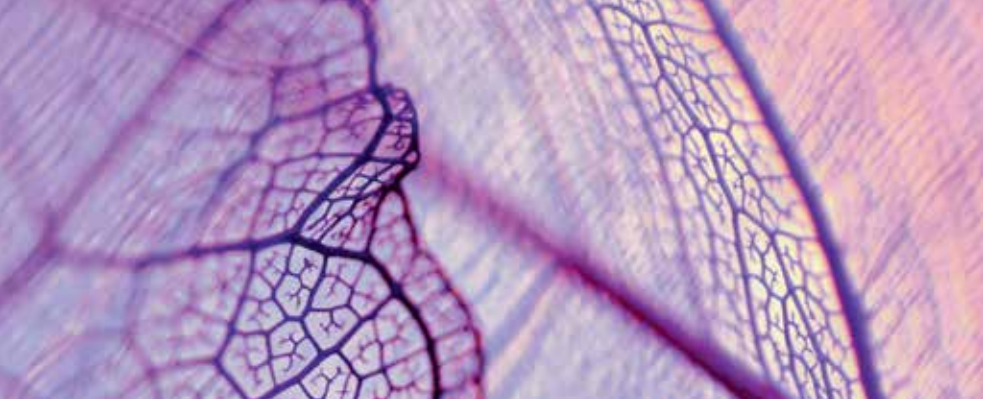
Next-generation researchers making meaningful impact

LAURIER STUDENTS AT ALL LEVELS OF STUDY ENGAGE IN CUTTING-EDGE RESEARCH ACROSS OUR CAMPUSES.

JULIA SZUSZ excelled in research by working summers as a student in **GEOFF HORSMAN'S** (Chemistry) lab, with a prestigious Undergraduate Student Research Award from the Natural Sciences and Engineering Research Council of Canada. Szusz focused on using enzymes to efficiently and sustainably make biologically active molecules, such as pharmaceuticals and pesticides. Her most significant accomplishment was co-discovering and characterizing a pair of complementary enzymes that can generate important intermediates in pharmaceutical manufacturing, leading to high-purity drugs manufactured in a greener way. Szusz is currently pursuing a PhD at the Department of Immunology at the University of Toronto.

JULIA READ left her violent home as a teenager and spent 15 years struggling with addiction. After residential treatment, she went back to school, motivated to support those who struggled as she did. Read earned two bachelor's degrees, in social work and in social development studies, from the University of Waterloo, and a Master of Social Work in the Indigenous field of study from Laurier. After working as an addictions therapist, Read returned to Laurier for her PhD with supervisor **SHOSHANA POLLACK** (Social Work) to research peer support in mental health and addictions services. In 2017, Read received the prestigious Hilary M. Weston Scholarship. This award will enable Read to continue applying her unique perspective to challenging orthodoxies both in addictions treatment and academia.

It's not uncommon to see tech startup web pages scattered with bios and photos of mostly male employees. Laurier student **PETER FISHER**, a PhD candidate in the Management program at the Lazaridis School of Business and Economics, uncovered how male-dominated teams affect selection and engagement of potential talent. The Human Resources Research Institute (HRRI) named the master's project he completed with supervisor **CHET ROBIE** (Organizational Behaviour and Human Resource Management) the best in Canada. In his research, Fisher found that all-male teams displayed on websites resulted in an advantage for certain male job candidates. His research unveiled that Science, Technology, Engineering and Math startups should recognize the potential negative effects from something as simple as putting their team on their website.



Interdisciplinary excellence

Laurier's research centres and institutes tackle local and global challenges, often combining disciplines to explore problems from multiple angles.

RESEARCH CENTRES AND INSTITUTES

Centre for Memory and Testimony Studies
Centre for Supply Chain Management
Centre for Women in Science
Cold Regions Research Centre
CPA Ontario Centre for Capital Markets and Behavioural Decision Making
Financial Services Research Centre
International Migration Research Centre
Laurier Centre for Cognitive Neuroscience
Laurier Centre for Community Research, Learning and Action
Laurier Centre for Economic Research and Policy Analysis
Laurier Centre for Military Strategic and Disarmament Studies
Laurier Centre for Music in the Community
Laurier Centre for Sustainable Food Systems
Laurier Institute for the Study of Public Opinion and Policy
Laurier Institute for Water Science
Lazaridis Institute for Management of Technology Enterprises
Manfred & Penny Conrad Institute for Music Therapy Research
Manulife Centre for Community Health Research
Movement Disorders Research and Rehabilitation Centre
MS2Discovery Interdisciplinary Research Institute
Sun Life Financial Centre for Physically Active Communities
The Co-operators Centre for Business and Sustainability
Tshepo Institute for the Study of Contemporary Africa
Viessmann Centre for Engagement and Research in Sustainability

The Laurier Institute for the Study of Public Opinion and Policy (LISPOP), led by **JASON ROY** (Political Science), studies issues related to the creation, use and representation of public opinion in the policy process. The institute promotes individual and collaborative research; monitors the practices and claims of the public opinion and interest group industries; and serves as an educational resource to the university and the larger community on questions and issues pertaining to those claims and practices. The 2018 Ontario provincial election made it a busy year for the institute. LISPOP associates administered an election survey in advance of the election that measured political attitudes and preferences towards a variety of issues. As a leading expert on the election, LISPOP member **BARRY KAY** (Political Science) participated in more than 80 media interviews with 24 news organizations, in addition to being an election analyst with Global News. Master of Applied Politics students **JAKE GORENKOFF, JESSE TOMA, CONNOR WARD** and **THOMAS WOOD**, along with alumnus **CHRIS CATTLE** (MA '04), helped with the Global News election coverage. Under Kay's leadership, the team members examined approximately 25 ridings each and projected a winner for each riding as early as possible.

From the starting line

EARLY CAREER EXCELLENCE

The most promising early-career researchers are able to advance groundbreaking research programs with the substantial support of the Ontario Early Researcher Awards.

LAURIER'S DIANE GREGORY (Kinesiology and Physical Education) received a prestigious Early Researcher Award from Ontario's Ministry of Research, Innovation and Science.

Lower back pain remains an extremely prevalent condition, and there is still a lot to understand about factors affecting its susceptibility to injury. Gregory researches the spine from both a mechanical and biological perspective. On the mechanical side, Gregory seeks to understand how various postures (such as twisting and bending) and loads affect the spine's risk of injury. On the biological side, she is using innovative approaches to assess how inflammation affects the quality of the spine and if it makes people more susceptible to further injury. The Ontario Early Researcher Award is allowing Gregory to enhance her student training program where she exposes students to hands-on spine research in her laboratory. Gregory and her team are making valuable contributions to rehabilitation practices in both work and sport environments.

Laurier recognized the exceptional talent of emerging researchers through the inaugural Early Career Researcher Awards.

The new award is a university-wide recognition of exceptional early-career faculty members who have made significant contributions to research or creative activities in their area of expertise and toward the training of students. Faculty members Bree Akesson (Social Work), Stephanie DeWitte-Orr (Health Sciences) and Ivona Hideg (Organizational Behaviour and Human Resource Management) were recipients of the inaugural awards.

BREE AKESSON (Social Work) works with Syrian refugees in Lebanon using innovative methods, including collaborative family interviews and geographic information systems (GIS) to learn more about their everyday experiences of displacement. Akesson is also helping to strengthen the mental health system in Afghanistan by working with two local universities to support faculty in their Counselling Psychology academic program. This collaboration will help develop a new generation of counselling psychologists to address the mental-health concerns of the Afghan population.

STEPHANIE DEWITTE-ORR (Health Sciences) is an expert in innate immune responses. Her research focuses on double-stranded (ds)RNA, a potent stimulator of cell protection mechanisms in humans and animals. She is working towards designing dsRNA-based therapies to protect animals from virus infections. DeWitte-Orr is one of a handful of researchers exploring dsRNA and believes these molecules are an underexplored resource for novel treatments to support the health of humans and animals.

IVONA HIDEG (Organizational Behaviour and Human Resource Management), addresses the leadership challenges of promoting, supporting and leveraging diversity, equality and inclusion in the workplace. Her well-publicized research also sheds light on how to attract and retain a diverse workforce, and promote greater equality and inclusion of traditionally disadvantaged groups. Hideg is driven by her quest to help fight inequality and better prepare organizations for diverse and equitable global workforces.

Research leadership at Laurier

Assisting children at risk for reading difficulty

ALEXANDRA GOTTARDO (Psychology) was named Laurier's University Research Professor for her work examining the development of reading in children. A world-class scholar, Gottardo has made significant impacts both within the academic community and among practitioners. She created assessment tools and programs to prevent reading difficulties in children who are at risk for reading problems due to low socioeconomic status or because they speak English as a second language. Actively improving the learning outcomes for youth, Gottardo's programs have been successfully implemented in schools and community centres across Ontario and abroad.

Using health data in powerful ways

Health care systems in low- and middle-income countries collect a lot of health-related data, and while collecting this information in the first place is a significant step, its accuracy remains unknown. **KAREN GRÉPIN** (Health Sciences), who was appointed as the Canada Research Chair in Global Health Policy and Evaluation (Tier II), would like to see health care data from low- and middle-income countries used with purpose. Grépin is hoping to find a way to properly validate existing data, which will transform how these countries evaluate health care programs and policies, and in turn, improve health systems.

Prestigious national academy selects Laurier faculty

The Royal Society of Canada recognizes scholarly research and artistic excellence to promote a culture of knowledge and innovation in Canada. Laurier faculty members Jennifer Baltzer (Biology) and Shohini Ghose (Physics and Computer Science) were selected for membership in the prestigious College of New Scholars, Artists and Scientists of the Royal Society of Canada. The College is Canada's first national system of multidisciplinary recognition for the emerging generation of Canadian intellectual leadership.

JENNIFER BALTZER (Biology) is a Canada Research Chair in Forests and Global Change (Tier II). She has studied northern, tropical and temperate forests and made important contributions in each of these biomes. Baltzer is a key member of the Government of Northwest Territories-Laurier partnership's science steering commitee and Laurier's lead in Global Water Futures, a $78-million Canada First Research Excellence Fund initiative led by four universities. She has also developed substantial collaborations with the Smithsonian Institute and NASA, both of which serve to deepen understanding of changes in northern boreal forests and help put these in a global context.

SHOHINI GHOSE (Physics and Computer Science) is a theoretical physicist working in the emerging field of quantum computing and information. She also promotes the participation of women in science as director of the Laurier Centre for Women in Science. She is vice-president of the Canadian Association of Physicists and co-editor in chief of the Canadian Journal of Physics. Ghose and her colleagues made the first observations of cesium atoms that showed a connection between chaos theory and quantum physics. A well-recognized expert, she gives many high-profile talks around the world and regularly speaks to international media organizations.

Highlighting excellence

TARAH BROOKFIELD'S (History) Social Sciences and Humanities Research Council (SSHRC)-funded research is uncovering the ignored history of Grindstone Island, a twelve-acre private island located in cottage country on Big Rideau Lake, near Kingston, Ontario. The island hosted the Grindstone Island Peace Centre (1963-1978) and the Grindstone Cooperative (1979-1990). Both centres offered peace and social justice programs for youth and adults. Incorporating Grindstone into the social and political history of Canada will help historians gauge how the peace movement impacted individuals engaged in activism and education. It will also shed light on how the ideas and peace work from Grindstone may have influenced broader social and political changes.

LINDIE LIANG (Organizational Behaviour and Human Resource Management) is tackling the important issue of abusive supervision in the workforce. Abusive supervision can take many forms, including undue credit, shifting blame, or humiliating or ridiculing employees. Liang's SSHRC-funded research investigates why and when abusive supervision occurs and what impact it has on the leader themselves. Liang's research will lead to effective organizational practices geared towards minimizing, and eventually eliminating, abusive supervision.

Funded by the Natural Sciences and Engineering Research Council (NSERC), **GIUSEPPE (JOE) CAMPOLIETI** (Mathematics) focuses on mathematical and computational finance by combining various areas of applied mathematics, probability theory, stochastic modelling, simulation methods and high-performance computing. His work can be applied in a variety of areas, including pricing and hedging of financial derivatives and the development of financial risk models.

The challenges confronting the next generation are immense and complex, and the sheer volume of data and information available in decision-making is simply overwhelming. This environment requires youth to solve problems with integrated approaches using emerging technologies. **COLLEEN WILLARD-HOLT** ↑ (Education) and **JULIE MUELLER** ↓ (Education) have teamed up with InkSmith Ltd., a Kitchener-based company with a mission to use 3D printing, robotics and design-thinking principles to fundamentally change how teachers and students interact with technology. With funding from the new SSHRC Partnership Engage Grant, Willard-Holt and Mueller piloted technology-enhanced design thinking with preservice teachers, assessing both the process and results of implementing design thinking through digital programming technologies. This work was recently recognized with the Best Paper Award at the 2018 Global Education, Teaching and Learning Conference.

LEE WILLINGHAM (Music) examines the powerful connectivity and impact of music on people's lives. Willingham seeks to discover how participation in music-making affects the musician's or listener's sense of identity and wholeness as a person. Willingham received funding from SSHRC to host a three-day conference in partnership with the International Centre for Community Music at York St. John University in the U.K. The conference brought together scholars and practitioners in participatory community music-making to advance current knowledge and the practice of community music as tools for reconciliation and social cohesion. Willingham also received funding from the New Horizons for Seniors program of Employment and Social Development Canada. This funding is used to run the Circle of Music, a choir for those living with dementia, their partner caregiver and teenage volunteers.

LAURIER'S KATHY ABSOLON-KING (Social Work) hosted a two-day event, After Canada 150: Restoring Indigenous Knowledge and Building Community Connections, to facilitate rich cross-fertilization of Indigenous academic and research perspectives. The event, funded through a SSHRC Connection Grant, encouraged multidirectional knowledge flow within and beyond the silos of academia and Indigenous communities. Uniquely located within the Haldimand Tract in southwestern Ontario, Laurier provided a critically important venue for building connection across cultural and knowledge divides.

Games research goes global

RACING AGAINST TIME TO COMPLETE THE ESCAPE ROOM

Gaming enthusiasts from 22 countries gathered in Budapest, Hungary in March 2017 to test their skill in the first-ever Escape Room World Championship, presented by Red Bull Mind Gamers. As the competitors raced against time to complete the escape room, they wrestled with riddles, clues, puzzles and problems designed by **SCOTT NICHOLSON'S** (Game Design & Development) team from Laurier's Brantford campus. With funding from Red Bull, Nicholson and three undergraduate students, **ROBERT DURANT, SEAN HARRISON** and **CHRIS TENUTA**, spent a summer in the Brantford Games Network Lab (BGNlab) developing the narrative and testing challenges for the championship escape rooms.

During their design work, the team built physical prototypes for many of the challenges and also turned to digital tools to test their ideas. Once tested and documented, the designs and prototype models were sent to a development team in Europe, which constructed the sets for the event in Budapest. The resulting event was televised on live Red Bull TV, where Nicholson was a commentator during the finals. Red Bull decided to expand the event to 36 teams in 2019 and has hired the BGNlab to create the escape rooms for the semi-final and final rounds. Red Bull has also provided additional resources to the BGNlab, allowing for research that explores how to reduce cultural bias in escape room design.

Influential mentorship

WHAT LUKE DEMOMME treasures most about his time conducting research at Laurier was the life-changing mentorship he encountered along the way. While completing his Master of Science in Kinesiology with a speciality in Neuromechanics, under the supervision of **MICHAEL CINELLI** (Kinesiology and Physical Education), Denomme co-authored several papers. Denomme has translated that education into his current position as a coordinator at a local long-term care facility, where he advocates for the home's residents and liaises with their families, while also managing a large interdisciplinary staff. He's grateful for the collaboration and teamwork skills he learned while working in Cinelli's state-of-the-art lab, but the most valuable lesson he learned was the importance of compassionate leadership, where Denomme knew that his mentor cared about his progression as a student. Cinelli's approach to student mentorship includes encouraging students to learn from failures and to use challenges as opportunities for personal growth. It is this type of influential mentorship and leadership — where being a caring individual comes first — that Denomme tries to emulate when he is overseeing the work of his own team.

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WILFRID LAURIER UNIVERSITY

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