2023 RESEARCH REPORT

Redefining the engineering learning experience.

uOttawa

Faculté de génie
Faculty of Engineering

Welcome to the 2022-23 Research Report of the University of Ottawa's Faculty of Engineering.

The following pages offer an overview of the innovative and impactful research led by our faculty members and students across a wide variety of fields that comprise the academic discipline of engineering.

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MESSAGE FROM THE DEAN JACQUES BEAUVAIS

DEAN OF THE FACULTY OF ENGINEERING

I am very proud to share with you the highlights from this spectacular year which reflects our commitment to transparency, innovation, collaboration, and growth.

NURTURING DIVERSITY, DRIVING INNOVATION

This year, our commitment to fostering inclusivity led us to establish a new leadership position within our faculty – the Vice-Dean, Equity, Diversity, and Inclusion is a strategic role that directly aligns with our faculty's values as well as our vision to create an inclusive and equitable community where all faculty, students, and employees feel valued, respected, and empowered to reach their full potential – an inclusive space for our community, to promote accessible education in engineering and to contribute to a more diverse workforce. We aim to eliminate barriers, promote equitable opportunities, and celebrate the richness that diversity brings to our academic community. By embedding EDI principles into our policies, practices, and curriculum, we aspire to be a catalyst for positive change, preparing our students to excel in a global and interconnected world while contributing to groundbreaking research and innovation.

(continued on next page)

DRIVING INNOVATION IN ENGINEERING EDUCATION

The launch of our first multidisciplinary design program welcomed its inaugural cohort to campus, and we are receiving overwhelming positive feedback that echoes our commitment to approaching engineering education in an innovative way.

We had the opportunity to present a new hybrid teaching model which enhances online learning by including a remote, in-person component at this year's NAFSA Conference—an initiative enabling international collaboration and remote education. This venture not only broadens our global footprint but also positions us as pioneers in advancing educational methodologies on an international scale.

Recognition on the global stage continued as we received a nomination for a QS Reimagine Education Award, a testament to the innovative approaches and dedication of our community.

In collaboration with IBM, we unveiled the groundbreaking uOttawa-IBM Cyber Range—a unique laboratory that stands at the intersection of academia, industry, and research. This cutting-edge facility promises to reshape the landscape of learning, offering invaluable opportunities for students, industry professionals, and researchers alike.

IMPACTFUL RESEARCH: AREAS OF FOCUS

Our five research areas are more relevant than ever, each contributing significantly to addressing contemporary challenges:

Enabling technologies for health care and augmented life: The uOttawa team of researchers, led by Dr. Robert Delatolla, who's leading globally recognized wastewater monitoring during the COVID era continues to provide crucial data to local hospitals, now expanding their scope to monitor emerging viruses at home and abroad.

Technology for the digital transformation of society: Beyond the cybersecurity research that will be conducted at the Cyber Range, researchers such as Dr. Hossein Bonakdari and Dr. Ousmane Seidou who are harnessing data science and AI to anticipate and mitigate the impacts of extreme weather events, while others like Dr. Lionel Briand and Dr. Jason Millar are investigating the ethics and the safety behind AI innovation.

Photonics for devices, networks and energy: In collaboration with key players in academia and industry, our experts ensure the resilience of North America's semiconductor supply chain, contributing to technological advancements that shape our future. Dr. Karin Hinzer, Vice-dean, Research and University Research Chair in Photonic Devices for Energy and her team have recently achieved a global recognition by manufacturing the world's first back-contact micrometric photovoltaic cells.

Sustainable and resilient Infrastructure: Our experts in this area are dedicated to developing sustainable construction products and fortifying existing infrastructure to withstand the tests of time. A team of researchers led by Dr. Miroslava Kavgic are working on using waste products like hemp, flax and wood shavings to create a composite that can replace Portland Cement, while another team led by Dr. Leandro Sanchez is studying the durability of various eco-friendly materials used in modern construction projects.

Emerging materials and processes: design and development: Our researchers are studying new materials and processes that will enable us to continue making technological and physical advancements in a more sustainable way. In this area, Dr. Benoit Lessard and his team continue to innovate as they identify different applications for the carbon-based materials they have developed, incorporating them into thin-film electronic and photonic devices.

As we reflect on this transformative year, we extend our deepest appreciation to each member of our community—students, faculty, staff, and partners—for their contributions to our ecosystem. Together, we are making a future defined by innovation, inclusivity, and impactful research.

Thank you for being an integral part of our journey.

Sincerely,

Jacques Beauvais

RANKINGS AND QUICK FACTS

№203	In the QS World University Rankings 2024
№177	In the Times Higher Education World University Rankings 2024
№150	In the CWTS Leiden Ranking 2023
№145	In the NTU World University Rankings 2023
Top 10[1]	Universities of Canada
135	Number of professors
130	Number of support staff
5000+	Number of undergraduate students
2000+	Number of graduate students
97.8%[2]	Employment rate two years after graduation

(1) Source: QS World University Rankings 2024 and Times Higher Education World University Rankings 2024

(2) Source: Ministry of Colleges and Universities – Ontario University Graduate Survey, 2018 – 2020

RESEARCH IMPACT

AREAS OF RESEARCH

Our five areas of focus allow our world-class researchers to collaborate in meaningful ways and to lead innovation at a faculty, provincial, national, and international level.

- Technology for the digital transformation of society
- Sustainable and resilient infrastructure
- Photonics for devices, networks and energy
- Emerging materials and processes: design and development
- Enabling technologies for health care and augmented life

RESEARCH OUTPUT

7499 Number of science publications from 2018-2021[1]

- In the Top 10%: **790**
- In the Top 1%: **94**
- In the Top 5%: **406**

RESEARCH FUNDING

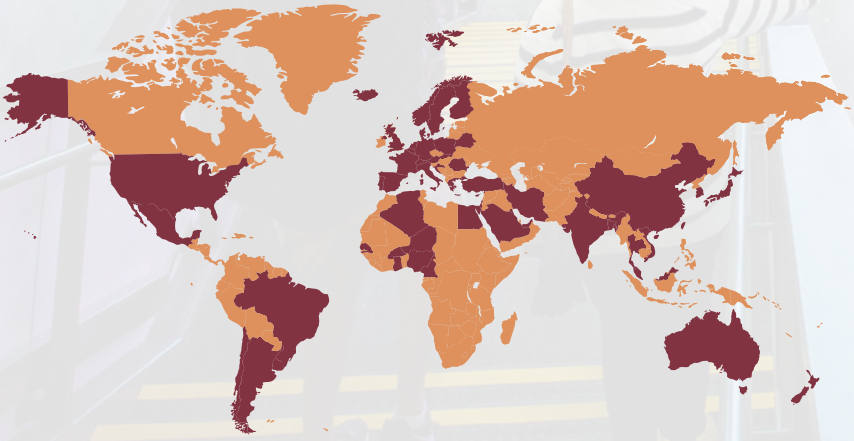
$17,155,986
Total value of research funding for 2021-2022

90%
Percentage of professors with external funding

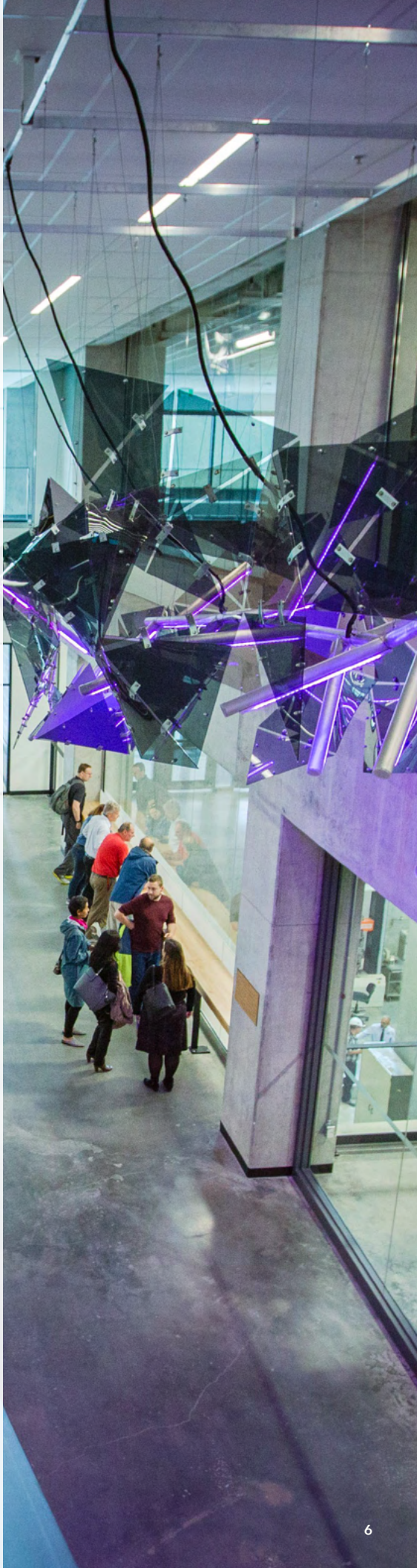
87%
Percentage of professors with tri-agency funding

INTERNATIONAL COLLABORATIONS

193 collaborations with **58** countries



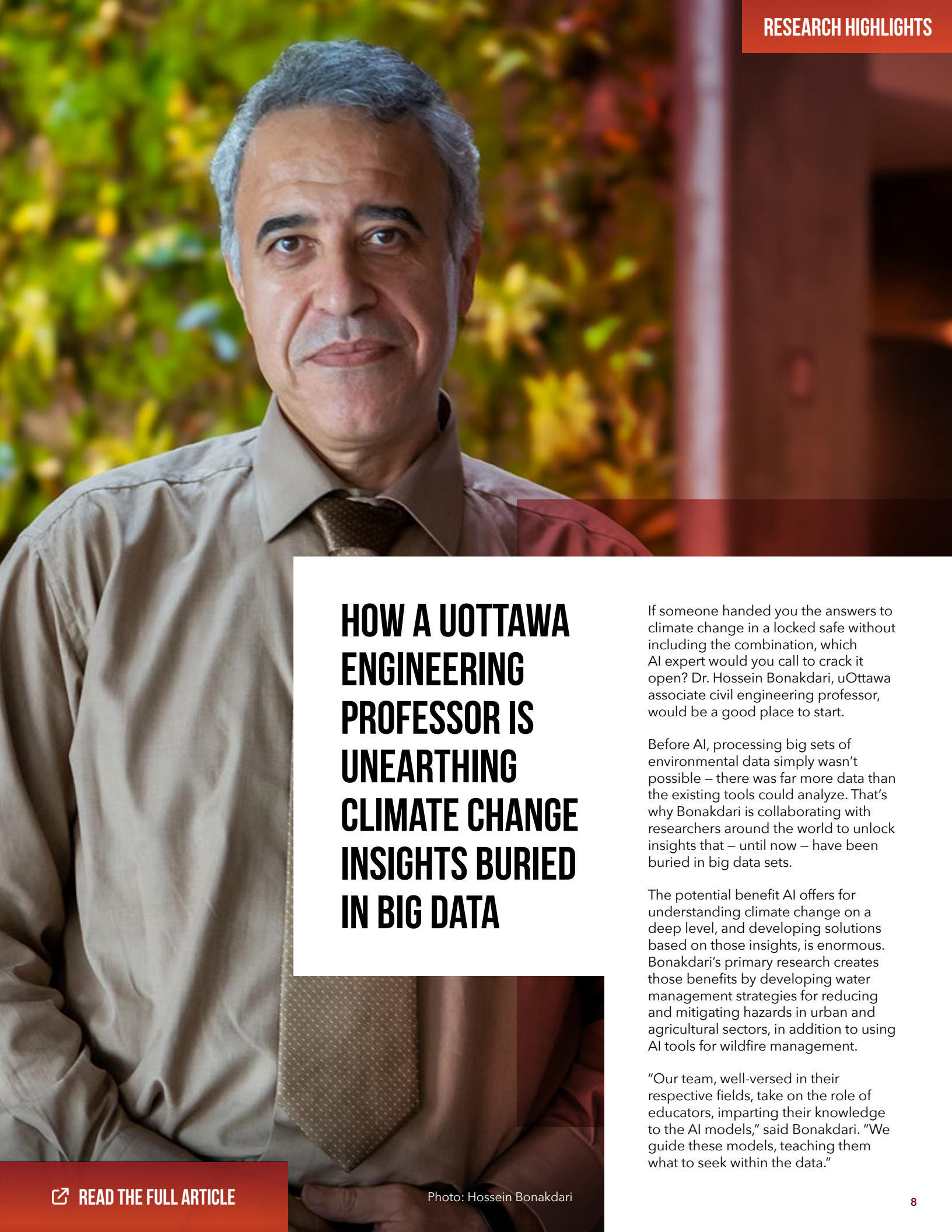
(1) Source: CWTS Leiden Ranking 2023



RESEARCH HIGHLIGHTS

Our focus: collaborative, interdisciplinary research that is of public value and considers the social, environmental, and economic impact of its solutions and findings.

Photo: Karin Hinzer, vice-dean, research



HOW A UOTTAWA ENGINEERING PROFESSOR IS UNEARTHING CLIMATE CHANGE INSIGHTS BURIED IN BIG DATA

If someone handed you the answers to climate change in a locked safe without including the combination, which AI expert would you call to crack it open? Dr. Hossein Bonakdari, uOttawa associate civil engineering professor, would be a good place to start.

Before AI, processing big sets of environmental data simply wasn't possible – there was far more data than the existing tools could analyze. That's why Bonakdari is collaborating with researchers around the world to unlock insights that – until now – have been buried in big data sets.

The potential benefit AI offers for understanding climate change on a deep level, and developing solutions based on those insights, is enormous. Bonakdari's primary research creates those benefits by developing water management strategies for reducing and mitigating hazards in urban and agricultural sectors, in addition to using AI tools for wildfire management.

"Our team, well-versed in their respective fields, take on the role of educators, imparting their knowledge to the AI models," said Bonakdari. "We guide these models, teaching them what to seek within the data."

READ THE FULL ARTICLE

Photo: Hossein Bonakdari

MEET VIDA DUJMOVIĆ, A UOTTAWA PROFESSOR WHO SOLVED A 30-YEAR-OLD PLANAR GRAPH PROBLEM

Together with her colleagues, Faculty of Engineering researcher Vida Dujmović has recently solved a 30-year-old problem involving planar graphs, making significant strides in this field.

In the world of mathematics and computer science, graphs are used to model complex systems that have applications in a wide variety of disciplines. Despite their simple appearance, graphs possess a rich and complex structure that has long intrigued mathematicians and researchers. Some classes of graphs are well understood, but others are much more complicated and are less, or even poorly, understood. Planar graphs are one such complex class.

Vida Dujmović, professor at uOttawa's Faculty of Engineering, was able to solve some longstanding problems by discovering a groundbreaking theorem that answers the question "what is the global structure of planar graphs?" In her pursuit of a better understanding of planar graphs, Vida, along with her close-knit group of international colleagues, developed the Product Structure Theorem for Planar Graphs.

The theorem proves that planar graphs can be expressed as a product of two well-understood and simple graphs: a path and a graph of treewidth 8. This theorem allowed them to solve several long-standing problems, including a conjecture on adjacency labelling from 1988, a conjecture on queue layouts from 1992, and a conjecture on non-repetitive colouring from 2002.

Photo: Vida and her international colleagues

READ THE FULL ARTICLE

WASTEWATER SURVEILLANCE RESEARCH PROVIDES A 12-DAY LEAD TIME FOR RSV SEASON: NEW STUDY

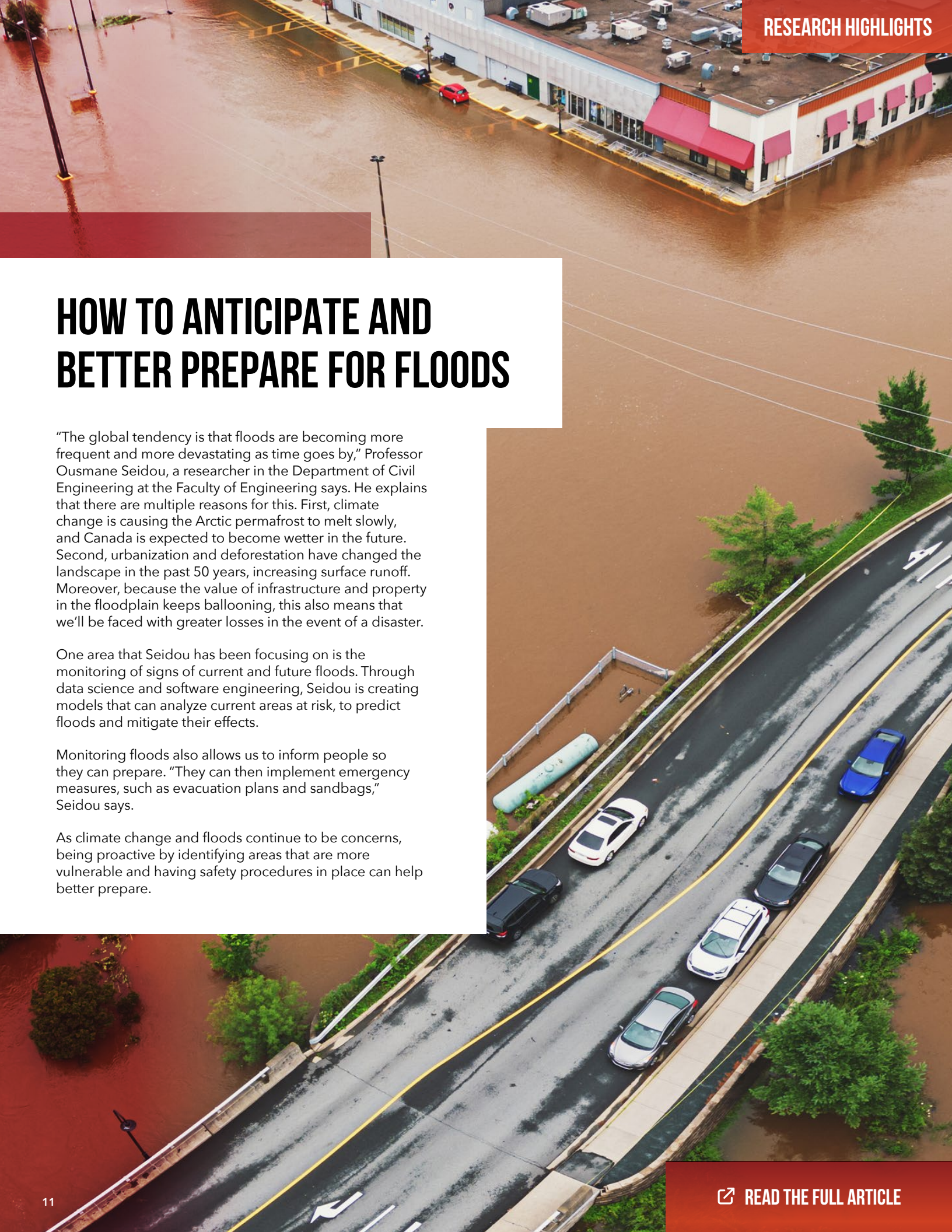
In a first-of-its-kind study, researchers using wastewater surveillance over conventional indicators have predicted the start of the annual respiratory syncytial virus (RSV) season 12 days early, providing more lead time for hospital preparedness and the timely initiation of RSV prevention therapy provided by the province for at risk-infants and young children.

Published in Frontiers in Public Health, the study is the first to describe the relationship between wastewater measurements and clinical data for RSV and to use near real-time wastewater measurements to accurately identify the start of the RSV season.

Working in close collaboration with CHEO Research Institute (RI) and McMaster's Children's Hospital, Dr. Robert Delatolla's lab at the University of Ottawa led the study during the early and intense 2022-2023 RSV season, comparing wastewater surveillance signals of RSV to clinical surveillance signals, which rely upon RSV clinical test positivity and hospitalizations.

Wastewater surveillance remains a crucial marker of pandemic spread in communities around the world. Since near the start of the pandemic the CHEO RI has collaborated with the Delatolla Lab, which has been a pioneer in wastewater surveillance, including the first in Canada to implement a SARS CoV2 (COVID-19) wastewater surveillance program in 2020. Dr. Delatolla and his Lab continue to provide daily viral RNA measurements to Ottawa Public Health, which are integrated into its respiratory illness reports.

READ THE FULL ARTICLE



HOW TO ANTICIPATE AND BETTER PREPARE FOR FLOODS

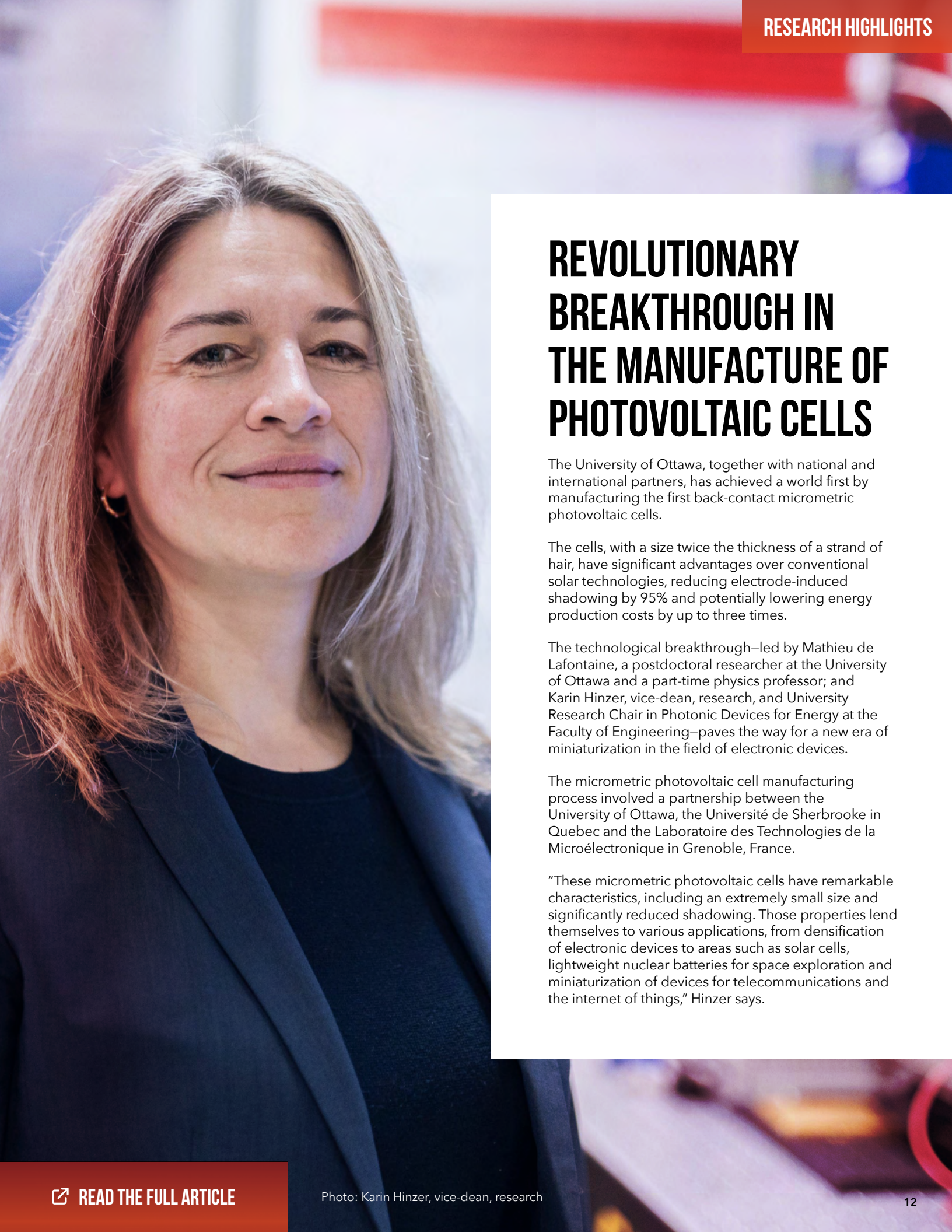
"The global tendency is that floods are becoming more frequent and more devastating as time goes by," Professor Ousmane Seidou, a researcher in the Department of Civil Engineering at the Faculty of Engineering says. He explains that there are multiple reasons for this. First, climate change is causing the Arctic permafrost to melt slowly, and Canada is expected to become wetter in the future. Second, urbanization and deforestation have changed the landscape in the past 50 years, increasing surface runoff. Moreover, because the value of infrastructure and property in the floodplain keeps ballooning, this also means that we'll be faced with greater losses in the event of a disaster.

One area that Seidou has been focusing on is the monitoring of signs of current and future floods. Through data science and software engineering, Seidou is creating models that can analyze current areas at risk, to predict floods and mitigate their effects.

Monitoring floods also allows us to inform people so they can prepare. "They can then implement emergency measures, such as evacuation plans and sandbags," Seidou says.

As climate change and floods continue to be concerns, being proactive by identifying areas that are more vulnerable and having safety procedures in place can help better prepare.

READ THE FULL ARTICLE



REVOLUTIONARY BREAKTHROUGH IN THE MANUFACTURE OF PHOTOVOLTAIC CELLS

The University of Ottawa, together with national and international partners, has achieved a world first by manufacturing the first back-contact micrometric photovoltaic cells.

The cells, with a size twice the thickness of a strand of hair, have significant advantages over conventional solar technologies, reducing electrode-induced shadowing by 95% and potentially lowering energy production costs by up to three times.

The technological breakthrough—led by Mathieu de Lafontaine, a postdoctoral researcher at the University of Ottawa and a part-time physics professor; and Karin Hinzer, vice-dean, research, and University Research Chair in Photonic Devices for Energy at the Faculty of Engineering—paves the way for a new era of miniaturization in the field of electronic devices.

The micrometric photovoltaic cell manufacturing process involved a partnership between the University of Ottawa, the Université de Sherbrooke in Quebec and the Laboratoire des Technologies de la Microélectronique in Grenoble, France.

"These micrometric photovoltaic cells have remarkable characteristics, including an extremely small size and significantly reduced shadowing. Those properties lend themselves to various applications, from densification of electronic devices to areas such as solar cells, lightweight nuclear batteries for space exploration and miniaturization of devices for telecommunications and the internet of things," Hinzer says.

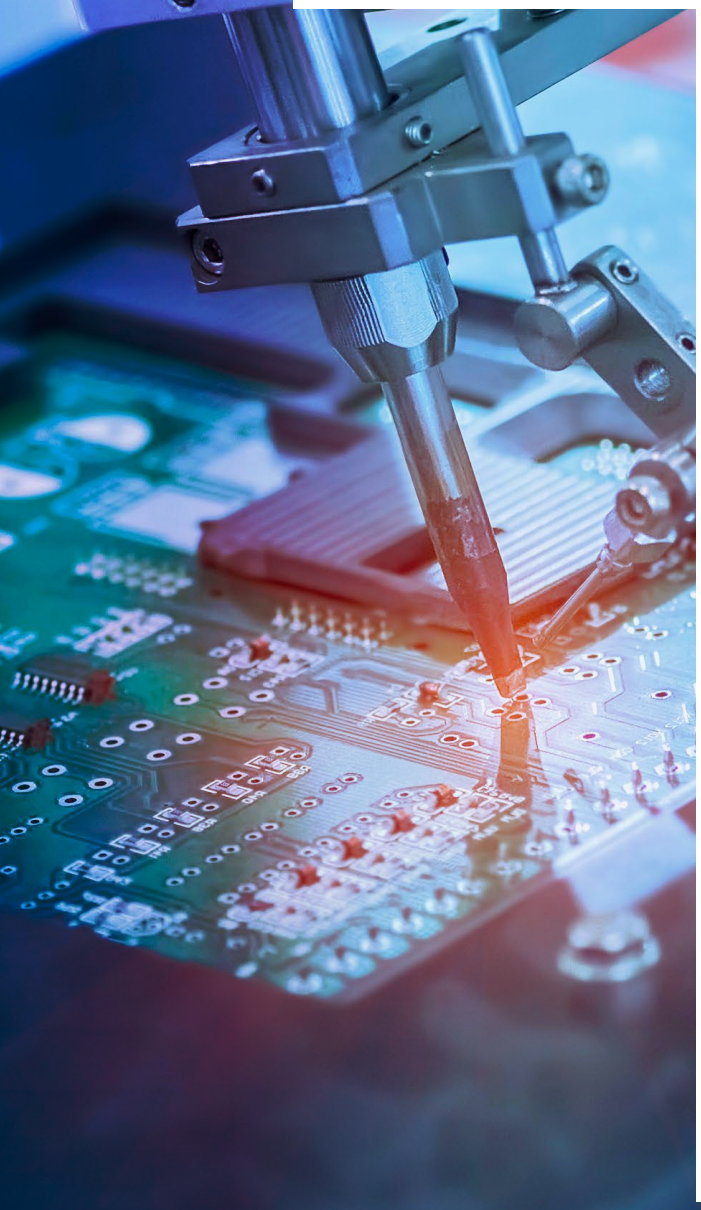
READ THE FULL ARTICLE

Photo: Karin Hinzer, vice-dean, research

PARTNERSHIPS AND COLLABORATIONS

Our strong ties and proximity to industry partners and government agencies enable our community to work on relevant issues and solve real-world problems.

COLLABORATING TO STRENGTHEN NORTH AMERICA'S SEMICONDUCTOR SUPPLY CHAINS



Semiconductors might not be the most visible to most of us, but they play a huge role in our daily lives and are increasingly in demand. However, since the COVID pandemic, sourcing these critical electronic components has been increasingly difficult.

Faced with a global semiconductor shortage, Canada, the United States, and Mexico decided to collaborate, with governments, industry, and academia joining forces to strengthen semiconductor supply chains in North America. As one of the world's top universities, uOttawa is committed to playing a key role in this collaboration. In particular, the uOttawa Faculty of Engineering is home to leading researchers in semiconductors and related fields, such as photonics.

Karin Hinzer, who is the Vice-Dean, Research of the Faculty of Engineering, gained extensive experience in the design and fabrication of group III-V semiconductor devices while at the National Research Council Canada, Nortel Networks, and then-Bookham (now Lumentum).

The current director of uOttawa's NanoFab Core Facility, Pierre Berini was elected to the Canadian Academy of Engineering, "for pioneering contributions to photonics."

Benoit Lessard, who holds the Canada Research Chair in Advanced Polymer Materials and Organic Electronics, focuses on developing new carbon-based materials and integrating them into thin-film electronic and photonic prototypes and emerging applications.

Ksenia Dolgaleva is world-renowned in the standardization of Indium phosphide (InP) fabrication processes through process design kits (PDKs). Her lab designs chips using non-linear photonic effects to drive progress towards the next generation of large-scale quantum computers.

Semiconductor supply chains are considered among the most complex for a number of reasons, including the processing steps involved and the geographic dispersion of manufacturing facilities. Given this complexity, and the extent of the current shortage, collaboration will be essential to ensure the resilience of North America's semiconductor supply chain.

READ THE FULL ARTICLE

PARTNERSHIP BETWEEN UOTTAWA AND EGYPTIAN MINISTRY PRESENTED AT NAFSA ANNUAL CONFERENCE

Dean Jacques Beauvais, Vice-Dean Graduate Studies Liam Peyton, and Manager of International Affairs Olga Golovachova, all from uOttawa's Faculty of Engineering, attended the 75th annual NAFSA conference to speak on building capacity in STEM via remote learning opportunities and the importance of university-government partnerships.

They discussed their experience with the Digital Egypt Builders Initiative (DEBI), a successful and active partnership between uOttawa and the Ministry of Communications and Information Technology (MCIT) of Egypt.

In 2020, uOttawa became the first university in Canada to sign a strategic partnership with the Egyptian government to train the next generation of Egyptian engineers in digital technologies as part of the Digital Egypt Builders Initiative (DEBI). Through this partnership, the Faculty of Engineering gained valuable experience in how to respond to an international government request for engineering education development via a remote learning model.

"Overall, our methodology involved careful analysis, customization, and collaboration with our partners to create a successful and unique remote learning experience for students in Egypt," said the Vice-Dean of Graduate Studies Liam Peyton.

READ THE FULL ARTICLE

RESEARCH PARTNERSHIP BETWEEN THE UOTTAWA FACULTY OF ENGINEERING AND TEC DE MONTERREY OPENS DOOR TO DISCOVERIES IN GLOBAL HEALTH RESEARCH

The University of Ottawa has joined forces with Mexico's Tecnológico de Monterrey through a joint seed grant program. This year, five joint research projects have been funded, each receiving $20,000.

Professors Jean-Philippe St-Pierre and Fabio Variola from the University of Ottawa have joined efforts with research professors Marion Brunck and Gerardo García-Rivas at Tec de Monterrey to study the mechanisms of osteoarthritis and develop early treatment through in vitro testing.

Professor Pierre Berini from the University of Ottawa is working with Dr. Israel De León, Dr. Gerardo de Jesús García-Rivas and PhD candidate Marcos Valero from Tec de Monterrey. As heart failure becomes a growing problem globally within aging populations, they're creating new biosensors that are compact, complex and capable of better, real-time detection using nanoplasmonic biosensors, which are highly sensitive to changes in the environment.

Professor Benoît Lessard and Professor Adam Shuhendler from the University of Ottawa are working with research professors Omar Lozano, Gerardo García and Noemí García of Tec de Monterrey to find new users for thin-film sensors. This project seeks to develop a practical, low-cost, highly sensitive sensor that can detect multiple ketone bodies at once. This could help control reversible tissue damage due to excessive ketone production within the body.

READ THE FULL ARTICLE

New uOttawa-IBM Cyber Range

"The uOttawa-IBM Cyber Range is a powerhouse for cybersecurity learning and research."

- Guy-Vincent Jourdan,
Professor and uOttawa-IBM Cyber Range co-director.

DEVELOPING A CYBERSECURITY-AWARE WORKFORCE: THE uOTTAWA-IBM CYBER RANGE

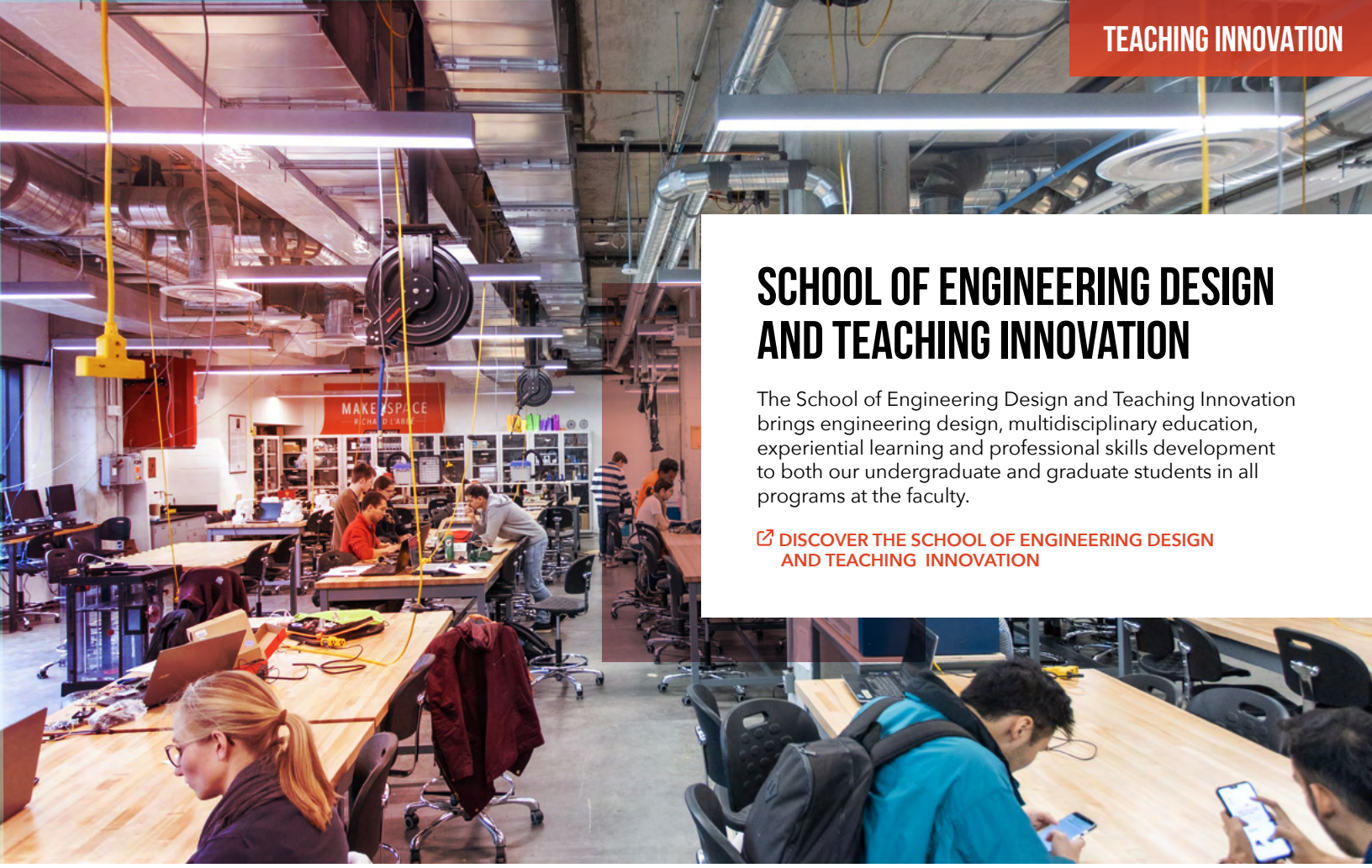
The newly launched uOttawa-IBM Cyber Range provides a space where organizations can train their employees and spur research and talent acquisition. It's poised to help grow Canada's cybersecurity and cybersafety workforce across government, academia and industry.

The uOttawa-IBM Cyber Range is a powerhouse for cybersecurity learning and research. Through sensory-immersive and interactive training simulations, we expose students and professionals to cutting-edge technology and real market expertise, so they can understand the theory, but also be ready for the real deal." - Guy-Vincent Jourdan, Professor and uOttawa-IBM Cyber Range co-director

DISCOVER THE uOTTAWA-IBM CYBER RANGE

TEACHING INNOVATION

We are redefining the engineering learning experience at the Faculty of Engineering. With an approach adapted to the realities of the 21st century, our mission is to train the next generation of change makers.



SCHOOL OF ENGINEERING DESIGN AND TEACHING INNOVATION

The School of Engineering Design and Teaching Innovation brings engineering design, multidisciplinary education, experiential learning and professional skills development to both our undergraduate and graduate students in all programs at the faculty.

DISCOVER THE SCHOOL OF ENGINEERING DESIGN AND TEACHING INNOVATION

DESIGNING THE FUTURE: NEW ENGINEERING PROGRAM AT UOTTAWA TO ADDRESS GAPS IN TECHNOLOGY JOB MARKET

The Bachelor of Multidisciplinary Design seeks to address the gap between theory and practice through experiential learning opportunities and collaborative projects. The flexible format will allow students to select hands-on learning experiences via course selection, internships, labs, and mentorship opportunities.

This is the first bachelor program to come out of the School of Engineering Design and Teaching Innovation, which also offers novel graduate level programs.

Students in the Bachelor of Multidisciplinary Design can choose from learning paths that were created in collaboration with industry experts to address real gaps in the job market to ensure that students will graduate market ready.

READ THE FULL ARTICLE

CHAMPIONING TEACHING INNOVATION IN ENGINEERING CLASSROOMS

Professors Andrew Sowinski and Clémence Fauteux-Lefebvre have been bringing exciting innovations to their classrooms, showcasing the variety of teaching styles and technology available today and the success that new methods can bring about.

The advantages of a flipped classroom: Clémence Fauteux-Lefebvre realizes that there is such diversity in the ways that students learn that it is hard to find one approach that works for everyone. The flipped classroom approach offers a mix of pre-recorded lectures and in-person tutorials to account for those who learn best on their own and for those who learn best with others. Exams are still part of the curriculum, but these workshop sessions aim to help students better prepare for exams, as well as their future careers, by encouraging them to understand the material on a deeper level. "The concept of exam could be something that may evolve with time as well," says Fauteux-Lefebvre.

A hybrid teaching environment and flexible class structure: Professor Andrew Sowinski has always been interested in adding new technology and methods to the classroom to support his teaching. His search for innovation uncovered a teaching methodology called HyFlex. HyFlex is an abbreviation of hybrid and flexible, where "hybrid" stands for both work that the student does on their own time (asynchronous work) and group work done in class (synchronous work), while "flexible" gives students opportunities to learn on their own time, in person, or remotely. In addition to the HyFlex method, technology plays an important role in Sowinski's teaching philosophy. "I am a big proponent of teaching with as many tools as I can, so that when students get into the workforce, they are already familiar with these tools and will have a competitive advantage over other graduates," he states.

REAL THE FULL ARTICLE

Photos: Fauteux-Lefebvre's and Andrew Sowinski

AWARDS AND FUNDING

NEW JELF FUNDING BOLSTERS PROJECTS IN SUSTAINABLE CONSTRUCTION, EXERCISE ACCESSIBILITY AND FOOD SAFETY

The John R. Evans Leaders Fund (JELF) is a top-tier research funding program run by the Canada Foundation for Innovation, a non-profit committed to investing in research across Canadian institutions. By providing researchers with the means to access key research infrastructure, the JELF program empowers them to become leaders in their respective fields and generate benefits for Canadians that cross social, health, environmental, and economic fields. This year, three Faculty of Engineering researchers received funding from the program: Miroslava Kavgic, Thomas Uchida, and Xudong Cao.

Zero-carbon building facility, led by Professor Miroslava Kavgic

Professor Miroslava Kavgic leads a team of researchers dedicated to mitigating the environmental impact caused by the construction industry. Kavgic's project seeks to use organic waste materials from Canadian agriculture and forestry industries to create sustainable construction products. By using hemp, flax, and wood shavings, her team aims to develop materials that offer excellent insulating properties to build resilient, zero-carbon buildings that promote energy efficiency and comfort in varying climate conditions.

The Assistive-device Biocompatibility Lab, led by Professor Thomas Uchida

At the Assistive-device Biocompatibility Lab (ABL), Professor Thomas Uchida is spearheading efforts to improve access to exercise for Canadians with low physical activity levels. His project seeks to improve the design of prostheses and exoskeletons in order to enhance the mobility and independence of people with amputations and the elderly, leading to better health outcomes and reduced health-care costs.

Ultra-sensitive biosensor to detect foodborne pathogens, led by Professor Xudong Cao

Professor Xudong Cao's research aims to develop a microfluid-based detection system to identify harmful foodborne bacterial pathogens quickly and efficiently. This area of research is traditionally undertaken by microbiologists and analytical chemists, but Cao hopes his research group's expertise in material surface modifications and fluid controls can contribute to rapid and sensitive detection of bacteria.

Photos: Miroslava Kavgic, Thomas Uchida, Xudong Cao

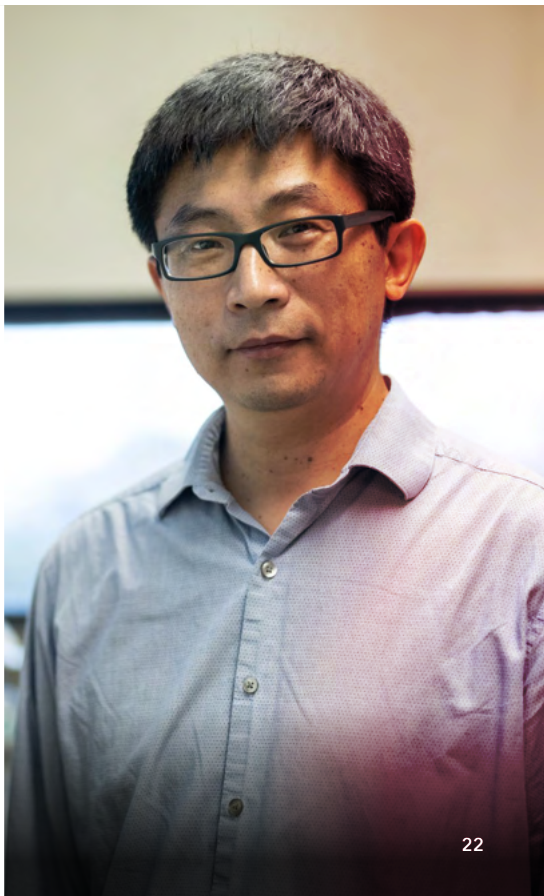


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Photo: Robert Delatolla

ROBERT DELATOLLA'S WASTEWATER WORK NETS MEDAL FOR ENGINEERING EXCELLENCE

Faculty of Engineering professor Robert Delatolla has been awarded the 2022 Ontario Professional Engineers Awards (OPEA) Engineering Medal for Engineering Excellence. Delatolla's research on biological wastewater treatment and wastewater surveillance of disease has had a significant impact on both public health and education. He's the lead investigator on Ottawa's COVID-19 wastewater monitoring program, which has acted as an early warning system for the spread of the virus. Over the past three years, his research group has helped the public understand the progression of COVID-19, and the wastewater surveillance system is now part of our everyday lives.

READ THE FULL ARTICLE

COMPUTER SCIENCE PROFESSOR AWARDED UNIVERSITY RESEARCH CHAIR

Professor Vida Dujmovic has been awarded a prestigious University Research Chair in Structural and Algorithmic Graph Theory. This new chair recognizes Dujmovic's cutting-edge research program in this area.

READ THE FULL ARTICLE

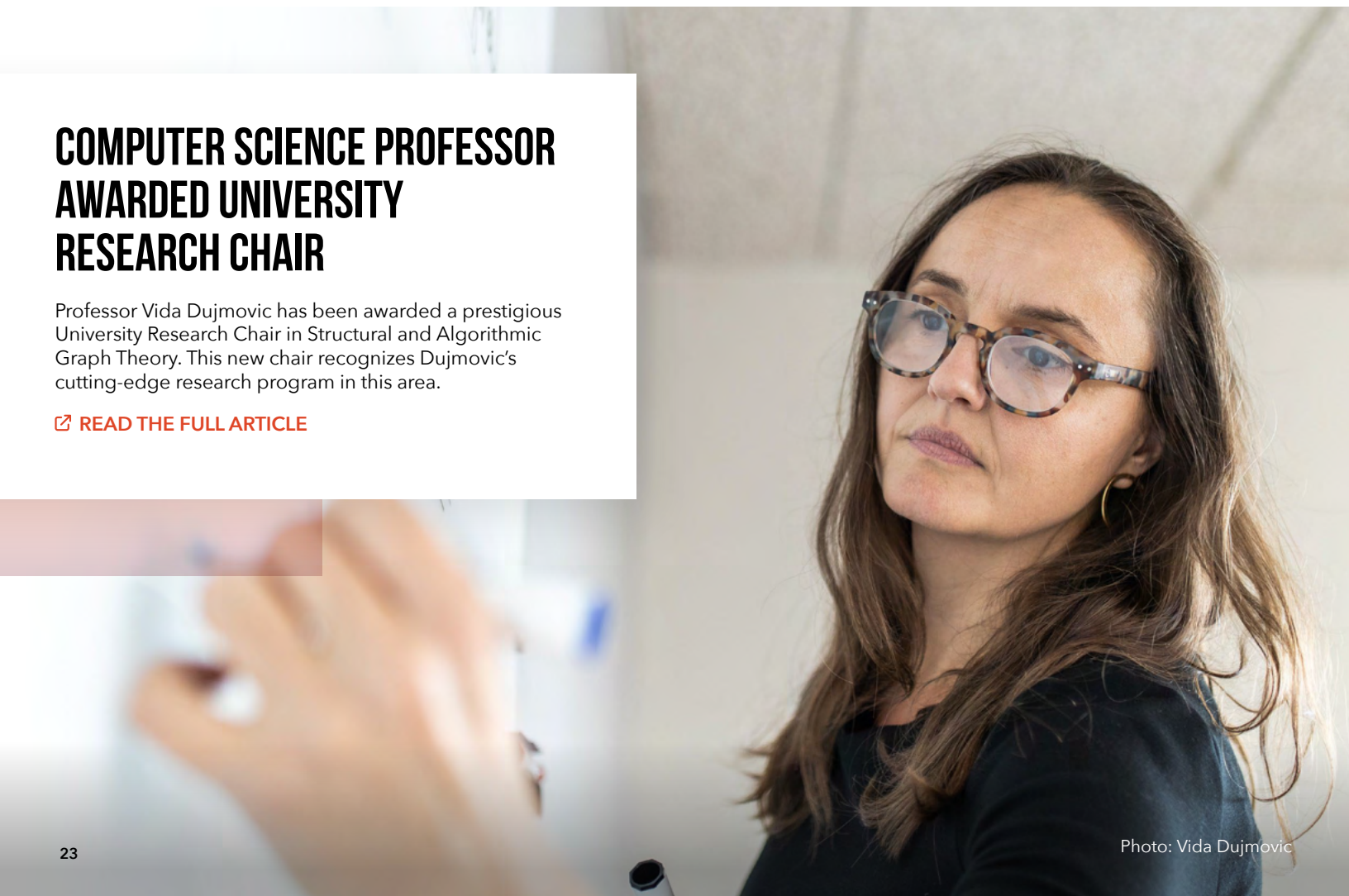

Photo: Vida Dujmovic

ENTREPRENEURSHIP

Our students are creative thinkers and builders. We support them along their chosen path and provide them with the tools and space to create tomorrow's leading companies.

Photo: Vida Gabriel

MEET ENGINEERING ALUMNA VIDA GABRIEL, AN ENTREPRENEUR UNDER 30 TACKLING CARBON CAPTURE

Vida Gabriel co-founded TerraFixing with fellow graduate Sean Wilson to tackle climate change with their unique direct air carbon capture technology. Incorporated in 2020, TerraFixing has developed an affordable, scalable technology to combat global warming by capturing carbon dioxide, a major contributor in climate change, from the air.

READ THE FULL ARTICLE

THE UOTTAWA ENGINEERING GRAD WHO BUILT ONE OF ONTARIO'S TOP CLEANTECH COMPANIES

Combining her passion for engineering and entrepreneurship, Belinda Gilbey's (BASc '14) company, BONDI Energy, is a leading player in Ontario's cleantech sector. Since 2019, the Toronto-based company has focused on retrofitting commercial and multi-residential buildings with heat pumps—lowering energy costs for property owners and shrinking their environmental footprint.

READ THE FULL ARTICLE

Photo: Belinda Gilbey

SUNNY FORECAST FOR A UOTTAWA START-UP DRIVING THE SHIFT TO A ZERO-CARBON FUTURE

In their lab at the University of Ottawa, University Research Chair in Photonic Devices for Energy Professor Karin Hinzer and Professor Henry Schriemer work with their team to develop new ways of harnessing the sun's energy. They have recently developed a new method for measuring the performance of bifacial solar panels to better represent outdoor conditions.

Now Enurgen Inc., a start-up born from their work in bifacial cell-to-system modelling, employs former graduate students, researchers, and professors from the University of Ottawa. Enurgen is helping to bring about the global transition to a zero-carbon future by leveraging its advanced modelling software to help generate clean, renewable, sustainable energy to power today's electric grids.

READ THE FULL ARTICLE

UOTTAWA ALUMNI LAUNCHES COMPANY TO IMPROVE AUTONOMOUS VEHICLE SAFETY

Sensor Cortek, a company started by uOttawa alum Fahed Hassanat, is using AI and deep learning to improve autonomous vehicle safety.

READ THE FULL ARTICLE

Photo: Fahed Hassanat

DELIVERING GOLF COURSE DRINKS BY DRONE

Kirality Drones, a company that provides drone delivery service for golf courses, is the brainchild of Zainab Badawi and Mohammad Abu-Shaaban, two recent mechanical engineering graduates. Last summer, they were able to test their product at the Marshes Golf Course in Kanata North during three golf tournaments. Golfers were able to order drinks from their phone using the Kirality app. The drinks were then delivered in a box by drone, without players having to wait for the drink cart to pass by.

Photo Credit: Kirality Drones

REAL THE FULL ARTICLE

EQUITY, DIVERSITY AND INCLUSION

We believe that a diversity of backgrounds and perspectives in the future generation of engineers is critical to ensuring that the new solutions and technologies developed truly respond to our society's needs.

$1M FROM TD READY CHALLENGE FOR NEW MITIGATION INITIATIVE TO BENEFIT INDIGENOUS COMMUNITIES

The National Indigenous Climate Compass (NICC), an online data analysis tool, is the winning project of a 1-million-dollar grant from the TD Ready Challenge that will help Indigenous communities adapt to and mitigate climate change risks. The tool will be developed at the University of Ottawa collaboratively with the Faculty of Engineering's Centre for Indigenous Community Infrastructure (CICI), Indigenous Tech. ai, and Indigenous communities.

"Most municipalities in Canada are well into the planning of how to cope with climate change. Indigenous communities will be among the hardest hit, but don't have the access to the data and solutions they need to properly prepare," shares Joseph Wabegijig, coordinator of the Centre for Indigenous Community Infrastructure (CICI) and spokesperson for the National Indigenous Climate Compass project.

This project – and this grant – provide a unique opportunity to assist these under-resourced communities and have a lasting impact. "It will support communities across Canada so they can adapt and thrive in the age of climate change," says Wabegijig.

In recent years, the University of Ottawa has undertaken a series of initiatives that have led to a greater Indigenization of campus and an increase in important research that can bring positive change in Indigenous communities. This includes the hiring of Indigenous professors, the creation of an Indigenous law certificate program Indigenous health research and the appointment of its first Indigenous chancellor.

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LEADERSHIP CHANGES TO MAKE UOTTAWA ENGINEERING EDUCATION MORE INCLUSIVE AND EQUITABLE

With a vice-dean, EDI and governance, joining its leadership team, the Faculty of Engineering has taken a step towards fostering a more inclusive and supportive culture for students, professors and staff. This new position indicates the importance of EDI in STEM and education to the Faculty, and the desire to enable change guided by EDI principles at every level of the faculty.

Professor Ghasan Doudak started in this position July 1. The new position comes with significant responsibilities and opportunities to achieve change within the Faculty and its broader community.

"I am hoping to be able to drive institutional change, foster a more inclusive and equitable environment, and create opportunities for all individuals to thrive and succeed."

- Ghasan Doudak,
Vice-dean, EDI and governance,

Photo: Ghasan Doudak, vice-dean, EDI and gouvernance

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