In this issue: USask study published in *Science* shows how controversial insecticides could be partly responsible for decline of wild bird populations, USask and City of Saskatoon partner on new research program, and much much more...

Every month, USask Research Profile and Impact highlights research from across campus. *Discovery Digest* is a glimpse into how USask research, scholarly and artistic work is making a difference for Saskatchewan, Canada, and the world.

Controversial insecticides shown to threaten survival of wild birds

New research led by Dr. Margaret Eng (PhD), a post-doctoral fellow in the USask Toxicology Centre, shows how the world’s most widely used insecticides—neonicotinoids—could be partly responsible for a dramatic decline in songbird populations. The study, published in the journal *Science*, is the first experiment to track the effects of a neonicotinoid pesticide on birds in the wild. Eng collaborated with Dr. Christy Morrissey (PhD), a USask ecotoxicologist in the School of Environment and Sustainability (SENS) and senior author on the paper, and York University biologist Dr. Bridget Stutchbury (PhD). Read more.

The news was read by more than 44.5 million readers and reported worldwide in more than 117 stories in major media outlets including Scientific American, Toronto Star, Science Daily, The Washington Post, Le Monde, Science Now, The Telegraph, National Geographic, New Scientist, Discover Magazine, Audubon, The Japan Times, Australian Broadcasting Corporation (ABC), BBC News, and CBS’s As it Happens.

Watch Morrissey’s TEDx talk on this topic at TEDxUniversityofSaskatchewan 2019 here.
**USask and City of Saskatoon partner to tackle urban issues**

USask and the City of Saskatoon are partnering on a new program to help solve challenging urban issues through the power of research collaboration. The new $100,000 cost-shared program—Research Junction—will involve teams of USask researchers and City of Saskatoon staff members working together to address community needs that include urban planning, reconciliation, transit, environmental sustainability, and youth issues. Read more.

**More frequent wild fires in the boreal forest threaten previously protected soil carbon**

As major wildfires increase in Canada’s North, boreal forests that have acted as carbon sinks for millennia are becoming sources of atmospheric carbon, potentially contributing to the greenhouse effect.

That’s the conclusion of an international research team that involves USask adjunct researcher Dr. Jill Johnstone (PhD) and recent USask PhD graduate Dr. Xanthe Walker, now a post-doctoral researcher at the Center for Ecosystem Science and Society at Northern Arizona University (NAU). The findings were published Aug. 21 in the prestigious journal Nature. Read more.

**USask part of $2-million investment in new prostate cancer research**

A team involving two USask researchers—Dr. Kishor Wasan (PhD), from the College of Pharmacy and Nutrition, and Dr. Franco Vizeacoumar (PhD) from the Saskatchewan Cancer Agency—is one of 10 teams across the country awarded a total of $2 million by Prostate Cancer Canada and Movember to accelerate discoveries that could save and improve men’s lives. The team, led by University of British Columbia researcher Dr. Michael Cox (PhD), will receive a total of $200,000 to investigate a new way to stop prostate cancer cells from growing, using new knowledge that blocking cholesterol will cut off one of the cancer’s fuel sources. Read more.
Synchrotron reveals important information about famous Paul Gauguin sculpture

Analysis carried out at the USask Canadian Light Source (CLS) synchrotron by Dr. Eric Henderson (PhD) from the Canadian Conservation Institute enabled the National Gallery of Canada to confirm an important finding about a Paul Gauguin sculpture in the museum’s collection. Henderson identified beeswax in paint samples from the sculpture, which raised the question of its function. His synchrotron results confirmed that the beeswax was applied as a coating over the paint. Read more.

Major Research Funding Success

Three USask research teams awarded total of $1.85M from CIHR

- Dr. Troy Harkness (biochemistry, microbiology and immunology, PhD), Dr. Terra Arnason (medicine, PhD, MD), and Dr. Christopher Eskiw (food and bioproduct sciences, PhD): $872,100 for five-year project entitled: “How to increase longevity one cell at a time.” The team will identify ways to improve health during aging.
- Dr. Yan Zhou (molecular biologist at VIDO-InterVac, PhD, in the photo): $757,350 for five-year project entitled: “How is influenza A virus detected by our body?” The project will provide a new rationale that paves the way for a better control of influenza infection and disease.
- Dr. Megan O’Connell (psychology, PhD) $218,025 for a two-year project entitled: “Measuring Cognitive Change in the Canadian Longitudinal Study on Aging.”
USask researcher awarded $1.2 million by the Western Economic Diversification Canada

Dr. Ajay Dalai (PhD), USask engineering professor and Canada Research Chair in Bioenergy and Environmental Friendly Chemical Processes, has been awarded $1.2 million by the Western Economic Diversification Canada to explore how to refine the manufacture of new biofuel, biochar and biopellet products. The funding is part of $28.6 million awarded to 22 companies and organizations in Saskatchewan.

Indigenous Focus

Revitalization collaboration: USask research team developing Indigenous languages app

Education professor Dr. Marguerite Koole (PhD) is working with a team of teachers, researchers and programmers from across campus to launch a web-based database to help educators revive Indigenous languages. The database, named wîcêhtowin, contains information and links to websites, video/audio repositories, and apps designed to improve language knowledge. Read more.

Featured in THE CONVERSATION

More frequent fires could dramatically alter boreal forests and emit more carbon

Dr. Jill Johnstone (PhD), adjunct biology professor.

The boreal forest is being reshaped by wildfire. As climate change intensifies wildfire activity, the boreal forest will likely become a carbon source.
Technology start-ups that fail fast succeed faster

Dr. Grant Wilson (PhD), business professor.

Canadian technology start-ups that incorporate an approach that learns from failure tend to perform and innovate with greater success than start-ups that seek to assign blame.

Write about your own research in The Conversation

Articles written by USask researchers have been read 1.09 million times since the university entered into a partnership with the SSHRC-funded Conversation Canada in June 2017. USask is a founding member of The Conversation Canada, an online academic journalism hub/newswire where researchers write plain-language editorials and explainers articles about their research.

Want to reach a broad audience with your research? Consider submitting an item to the Conversation. Wondering where to start? Read a short explainer on how to write for the Conversation Canada. Read previous USask articles here and get in touch with Kathryn Warden.

Entrepreneurship

USask summer program leads to student-led start-ups

Fifteen students in the 2019 Summer Entrepreneurs program (SE), initiated by USask commercialization unit Innovation Enterprise (IE), teamed up over the summer to learn about aspects of business and entrepreneurship, inspired by company mentors. The student teams picked five USask research technologies to work on, using the Lean Startup method. Read more.

Some of the teams are considering bringing their technologies to market as student-led start-up companies. These include:
• **Soteria MedTech** (Cuylar Conly, Yash Shukla and Udoka Okpalauwaekwe), to commercialize an improved oral airway device that can help patients breathe while unconscious;
• **Vicia** (Jessa Huges, Cole Boser, Todd Thorsness) to commercialize a new ornamental faba bean plant.

In the photo, USask President Stoicheff makes opening remarks at the [Summer Entrepreneurs program](#) showcase event at the end of August and visits with the student teams.

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### Young Innovators

**Dietary restrictions may benefit children with premature aging disease**

PhD student **Zoe Gillespie** and her supervisor Dr. **Christopher Eskiw** (PhD), USask food and bioproduct science professor, tested a well-known treatment for type 2 diabetes on cells of patients with progeria. They showed that the drug, which mimics a state of dietary restriction, improves the function and lifespan of cells—a finding that could also improve the quality of life of the elderly and people with obesity.

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### Student Research

PhD student **Tristan de Boer** won the poster competition at the 19th Canadian Semiconductor Science and Technology Conference (CSSTC2019) held on the USask campus. Using the USask Canadian Light Source synchrotron, de Boer’s project is about shedding light on fundamental chemical changes that occur in the cathode material in batteries, in particular graphite, to potentially create more environmentally friendly batteries one day.
Virtual failures offer real learning in USask engineering lab

Thanks to new Truss VR software poised for improving learning through virtual reality, USask engineering students did a build/crash/rebuild scenario thousands of times to learn about trusses, a common topic in the first-year statics course. The college developed the software in partnership with a local tech company, Sprockety, and the USask Gwenna Moss Centre for Teaching and Learning. Their work was backed by alumni Ron and Jane Graham, whose donation supported the creation of the software, and the Virtual Reality Teaching and Cloud-Based Learning (ViRTCL) Lab in the Engineering Building. Read more.

Leadership Focus

Physics professor appointed international SuperDARN chair

Dr. Kathryn McWilliams (PhD) has been appointed chair of the international SuperDARN Executive Council, the first Canadian to hold this position. SuperDARN—the Super Dual Auroral Radar Network—is an international scientific collaboration dedicated to studying Earth’s upper atmosphere using radar. Eleven countries and more than 30 radar sites around the world are involved.
Major Accolades

**Renowned USask watershed scientist honoured by the Royal Society of Canada**

Dr. Irena Creed (PhD)—one of Canada’s most influential water scientists and USask associate vice-president of research—has been named a Fellow of the Royal Society of Canada (RSC), the country’s national academy of distinguished scholars, artists and scientists. RSC Fellows are peer-elected as among the best in their field and are called upon to advise governments, non-governmental organizations and Canadians on matters of public interest. The newly elected Fellows were announced Sept. 10 and will be inducted at a special ceremony in Ottawa on Friday, Nov. 22, 2019. Read more and watch the video.

**Highly regarded USask water scientist honored with prestigious Royal Society medal**

Dr. John Pomeroy (PhD), Canada Research Chair in Water Resources and Climate Change at the University of Saskatchewan, has been awarded one of Canada’s top honours for outstanding contributions to environmental science.

Pomeroy, one of the world’s most cited snow hydrologists, will be presented with the Miroslaw Romanowski Medal from the Royal Society of Canada at a Nov. 22 ceremony in Ottawa in recognition of his exceptional contribution to snow research and the cold-season hydrology of mountain regions. Read more.

**USask professor to research northern trapping through David Suzuki Fellowship**

Indigenous studies professor Dr. Priscilla Settee (PhD) is the recipient of a $45,000 David Suzuki Fellowship. Through the fellowship, Dr. Settee will study trapping in northern Saskatchewan and its impact on quality of life of Indigenous northerners. Read more.
Māori and Chinese scholars awarded post-doctoral fellowships to do research at USask

Māori scholar Dr. Jane Green (PhD) and Chinese researcher Dr. Xin Feng (PhD) have each been awarded $88,000 over two years through Misiwêskamik International Postdoctoral Fellowships from the College of Graduate and Postdoctoral Studies (CGPS) to do research at USask starting this month:

- **Green** will do a two-country comparative policy study looking at historical and contemporary government policies employed to remove Māori, First Nations and Métis children from the care of their families and communities. Green is a tribal member of the Ngāti Awa and Ngāti Ranginui iwi from the Mataatua region of the Bay of Plenty, Aotearoa, in New Zealand.
- **Feng** will study the feed quality of feedstock analyzing how ruminants such as cows digest it and how effectively the feedstock delivers nutrients to animals.

It is the first “in-house” funding for post-doctoral fellows at USask. The CGPS Fellowship is funded through the [USask International Blueprint for Action](https://www.usask.ca/graduate-studies/postdoctoral-fellowship) and is available only to international scholars. The name “Misiwêskamik” was selected to reflect the Plains Cree word meaning “all over the land, all over the world.”

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**Upcoming Events**

**Register now for Oct. 23-24 P2IRC Symposium**

The Global Institute for Food Security (GIFS) at USask will hold its 4th annual Plant Phenotyping and Imaging Research Centre (P2IRC) symposium October 23-24 at the Delta Bessborough. This year’s theme of “Achievements. Expectation. Implementation” provides an opportunity to learn about accomplishments and the next phase of P2IRC, a digital agriculture research centre funded by a major grant to the university from the Canada First Research Excellence Fund.

The event brings together 300 researchers, industry leaders and students from around the world to discuss the latest science in genomics, phenomics, machine learning and root plant imaging, as well as research applications for breeders and social scientists. To register or watch a short video to learn more, visit: [https://p2irc.usask.ca/2019symposium/](https://p2irc.usask.ca/2019symposium/)
Inaugural Peter Scherk Lecture in Geometry

Geometry and topology expert Dr. Daniel Freed (PhD), a past Guggenheim Fellow and Sloan Fellow, delivered the lecture inaugural Peter Scherk Lecture in Geometry on Sept. 16. The lecture was named after Dr. Peter Scherk (PhD), a prominent USask mathematician and professor from 1943-1959 who, due to Nazi expulsion of Jews from Germany, was welcomed to Canada at USask.

The lecture was a kick-off event for quanTA, USask’s new Centre for Quantum Topology and Its Applications. The Centre is bringing together experts from mathematics, physics, chemistry, computing and other disciplines to work on all aspects of topological materials.

In the photo, Daniel Freed.

Lecture: EDI for Scientists

On Sept. 25, University of Alberta biological sciences professor Dr. Lisa Willis (PhD) will teach a seminar for researchers on how to write Equity, Diversity and Inclusion (EDI) statements, now required for Tri-Council funding applications. The lecture will be at 1:30 pm in Health Sciences GB03. Read more.

Inaugural 2018-19 Structurist Fellow to give Oct. 17 talk

The recently established Structurist Fellowship propagates the legacy of The Structurist, an international interdisciplinary journal founded in 1960 by Eli Bornstein, which addresses art, architecture, ecology, culture and communication. Bornstein is a Saskatoon artist and former USask art department head who was awarded the Order of Canada earlier this year.

On Oct. 17, the inaugural lecture will be given by the first newly appointed Structurist Fellow, Lawrence Blough, principal of GRAFTWORKS Design Research and professor at the Pratt Institute School of Architecture. He will talk about emerging and more equitable distribution models for goods, services and living arrangements, also known as the “access economy.” The lecture will be held at 7 pm in the Agriculture Building Atrium. Read more.
New Gordon Snelgrove Gallery Exhibit

Work by artists Jianzeng Fu and Shawn Zheng will be on display at the Gordon Snelgrove Gallery from Sept. 23 - Oct. 4 as part of an exhibit entitled “Calligraphy, Painting, Landscape, Abstraction”. Shawn Zheng teaches in the USask art and art history department. Read more.

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