



January 2023 - Issue 60

Discovery Digest is a glimpse into how University of Saskatchewan research, scholarly and artistic work is making a difference for Saskatchewan, Canada, and the world. Curated by the Research Profile and Impact unit, Office of the Vice-President Research. [Feedback welcome!](#)

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This Month's Stories



\$14 million for Crop research at USask

University of Saskatchewan (USask)'s Crop Development Centre, which has developed more than 500 crop varieties across 40 crop types over the past five decades, has been awarded \$7.2 million in operating funds for the next five years from the Saskatchewan Agriculture Development Fund (ADF).

As well, 19 USask researchers were awarded \$6.8 million through ADF for 29 innovative crop-related projects, ranging from using plant-derived ethanol and biodiesel to reduce plastic waste, to developing nutritionally balanced milk using pulse and oilseed protein, to tackling an urgent root rot problem in lentils.

Calif. aquifer warning a wake-up call for Canada: top water scientist

In a recent paper in *Nature Communications*, Dr. **Jay Famiglietti** (PhD), USask hydrology professor emeritus and former executive director of the Global Institute for Water Security, warns that foot-dragging over water management and over-pumping threaten to dry up aquifers in California's Central Valley. The area supplies produce for most of North America. Famiglietti says the problems is a wake-up call for Canada, where more than half of the population relies on groundwater for drinking, and for Saskatchewan, which is striving to double its food production capacity.





National body honours USask early career chemist

USask researcher Dr. **Tara Kahan** (PhD), a world leader in both atmospheric chemistry in snow and ice and indoor chemistry has been recognized as the Chemical Institute of Canada (CIC) Environment Division's Early Career Researcher for 2023. Her ground-breaking research revealed that pollutants behave much differently on snow and ice surfaces than in liquid water. She also gained world attention for

showing the impacts on indoor air quality from the use of gas stoves, and people using chemical products for hyper-cleaning at the height of pandemic fears.

Top 10 most read research stories of 2022

1. **USask chemists solve 27-year-old riddle, produce promising new compound**
2. **Having visible tattoos gives psychologists more cred: USask research**
3. **Disrupting COVID-19 with potential new treatments: USask research**
4. **Zapping brain cancer with long needles opens door to new treatments: USask research**
5. **The state of water security in Canada: A water-rich nation prepares for the future after seasons of disaster**
6. **USask-led research team aims to develop vaccines for prion diseases**
7. **Huanan market identified as epicentre of COVID-19 pandemic**
8. **How does dairy affect a child's growth and development? USask researchers determined to find out**
9. **USask major scientific centres awarded \$170M of MSI funding**
10. **Global Institute for Food Security at USask making speed a priority**



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Studies delve into housing security, homelessness

Pathways y, a donor-funded initiative at USask, is supporting a trio of projects focused on housing security, renters' rights, and homelessness. The projects, which all involve collaborations between USask researchers and community leaders, aim to provide better understanding of a variety of housing issues for Saskatchewan residents.

VIDO's economic impact over half a billion dollars: SREDA study

The Saskatoon Regional Economic Development Authority

(SREDA) released key findings from its Economic Impact Study conducted on USask's Vaccine and Infectious Disease Organization (VIDO)--VIDO's operations and construction projects contributed more than \$511 million to the economy in the last decade. The impact of VIDO's commercialized vaccines was not included in the study.



New connections advance health and wellness at USask

While experts in music and immunology may not typically have much in common, an unlikely pair of researchers are leading a new area of research focus for USask. Choral director Dr. **Jennifer Lang** (PhD) and immunologist Dr. **John Gordon** (PhD) are co-leading USask's new Health and Wellness signature area of research.

Delving deeper into swine dysentery

Pork producers around the world suffer economic losses because of swine dysentery, an intestinal disease in pigs for which there's no vaccine. Dr. **Matheus Costa** (DVM, PhD) of the Western College of Veterinary Medicine (WCVN) is working to develop a vaccine by using DNA sequencing technology to analyze *Brachyspira*, the disease-causing bacterium.



His research also has implications for public health, addressing food security and sustainability as well as decreased antibiotic use.



Guide aims to help put the welcome mat out for pets

Saskatchewan is the only province where landlords can reject prospective renters who have pets.

A collaboration between USask's One Health and Wellness office, WCVN, and Royal Canin has led to a new pet-friendly rental housing guide for Saskatoon. By developing this guide, researchers aim to raise awareness of the benefits of

allowing pets in rental housing.

Cleaning contaminated water with flax shives

Using the Canadian Light Source (CLS), a team of researchers from USask has found a common agriculture byproduct can treat wastewater contaminated by antibiotics and other

pharmaceutical chemicals.

In this study, Dr. **Catherine Niu** (PhD), a chemical engineering professor in the Department of Chemical and Biological Engineering, demonstrated that flax shives that have been treated with heat and steam adsorb the medication carbamazepine from wastewater. Flax shives are the material left after fiber is extracted from flax stems. Niu hopes that by creating adsorbents that are inexpensive and easily accessible, they can attract the attention of businesses looking for more efficient ways to treat wastewater.



Innovative fuels for Small Modular Reactors

USask's Dr. **Andrew Grosvenor** (PhD) is working with scientists from Canadian Nuclear Laboratories (CNL) to explore how advanced nuclear fuels for small modular reactors (SMRs) could be used to help fill the gap between fossil fuels and renewables.

SMRs can power electrical grids, provide process heat, and offer energy solutions for various industries — such as remote mining operations. The advanced fuel the team is investigating combines uranium oxide — the main element used in nuclear fuel for decades — with the naturally occurring and abundant element thorium in oxide form. The CLS allowed researchers to study the electronic and local structure of the fuel — crucial information needed to identify the optimum fuel composition that would have better in-reactor performance than that of uranium oxide.

Life and legacy of Nobel laureate Henry Taube

The USask Office of the Vice-President Research has recently assembled a new webpage, celebrating the life and accomplishments of **Henry Taube**, the only Saskatchewan-born Nobel laureate. Taube attended USask for his undergraduate and master's degrees, and was awarded the Nobel Prize for chemistry in 1983. The webpage is part of a collaboration with *Defining Moments Canada*, celebrating all of Canada's Nobel laureates, and includes a story, video, and podcasts created by USask graduate student **Erin Matthews**, who is supervised by historian Dr. **Erika Dyck** (PhD).





A story of fire and ice: USask research studies how wildfires impact glacier melt



Young Innovators: **Quantum computers can enhance medicine, artificial intelligence: USask research**



USask-led project shows path to food security in at-risk communities



USask researchers to gain remote access to huge array of Statistics Canada data

***In* THE CONVERSATION**

Alberta's new policy on psychedelic drug treatment for mental illness: Will Canada lead the psychedelic renaissance?

By Dr. Erika Dyck (PhD)

Alberta's new policy on psychedelic-assisted therapy for mental illness may set a precedent that moves Canadians one step closer to accepting psychedelics as medicinal substances.



How do snowflakes form? Is each snowflake really unique? Why is some snow light and fluffy or heavy? The amazing science of snow

By Dr. Krystopher Chutko (PhD)

Molecule by molecule, a snowflake grows and eventually begins to fall. A scientific look at the amazing nature of snowflakes and snow.



Looking forward into the past: Lessons for the future of Medicare on its 60th anniversary

By Dr. Marc-Andre Pigeon (PhD), Dr. Haizhen Mou (PhD), and Natalie Kallio

At the dawn of Medicare, Saskatchewan's community co-op clinics pioneered team-based, holistic care. Now, with the health system in crisis 60 years later, it may be time to return to that care model.



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Undergraduate Research

New Deadline for NSERC USRA: Jan. 23, 12pm

The new deadline for the upcoming NSERC USRA applications is extended to Monday, January 23rd at noon, Saskatchewan time. The new extended application period and timeline accommodates the NSERC USRA portal update, which will happen January 16th-19th 2023. Applications already in the NSERC USRA portal system will need to be updated and resubmitted once the portal is



reopened on January 19th, and before the new deadline.

From OVPR

Call for SSHRC Awards Nominees – Deadline Jan. 31, 2023

The SSHRC Impact Awards recognize outstanding researchers and celebrate their achievements in research, research training, knowledge mobilization and outreach activities funded partially or completely by SSHRC. USask is limited to one submission per **award category** so an internal process will be held.



Internal submission deadline is Jan. 31. Email the following to research.communications@usask.ca

- Nominee name and affiliation
- **Award category** being considered
- 500-word rationale for suitability for award
- Names of those who can support nomination development (if known)
- Current CV (specific CV format not needed at this stage, however, if the nomination is to go forward, an updated SSHRC CV format will be required)



Submit your research image to NSERC's Science Exposed contest today for a chance to win!

NSERC has recently launched a new edition of the **Science Exposed** contest, in collaboration with Acfas. The research image contest challenges researchers to combine creativity and science for a chance to win cash prizes of \$2,000.

The Science Exposed contest is devoted exclusively to images of scientific research, in all fields of study, but not research in the arts. We invite you to review the **contest rules** before capturing your image. Contest closes on Monday, January

30, 2023, at 11:59 p.m. (ET).

A French version of this competition, called **La preuve par l'image** is also organized by l'Acfas in collaboration with NSERC. **Submit your image!**

(AND BONUS -- You can also submit your research image to **USask's Images of Research**

Upcoming events



TEDxUniversityofSaskatchewan

TEDxUniversityofSaskatchewan is an event filled with a suite of short, carefully prepared talks, demonstrations and performances. It engages those with the bold ambition to be what the world needs--fostering learning and wonder, sparking conversations that matter and stimulating courageous curiosity, boundless

collaboration and inspired communities. The 2023 event will be held on Sunday Jan. 22.

Learn more about the speakers [here](#).

Interested in attending? **Submit your name** and you will be contacted by USask Research Profile and Impact when tickets are released.



Rethinking the Way We Farm featuring Dr. Bina Agarwal - Jan. 31, 2023, 7:00 - 8:30 PM

Hosted by the Canadian Centre for the Study of Co-operatives, the Johnson Shoyama Graduate School of Public Policy, and the Office of the Vice-President Research, globally renowned development economist Dr. **Bina Agarwal** (PhD) will speak about the storm brewing in the global agricultural community.

Agarwal proposes that we need to rethink the way we farm by moving away from unsustainable and unequal farm sectors towards alternatives that are technologically, environmentally, and institutionally different.

Her online talk is free and open to the public. **Register to attend.**



Join Campus Conversations

Campus Conversations—conversations on research, scholarly, and artistic work at USask, hosted by the Office of the Vice-President Research—resumed for 2022-2023, starting Oct. 20.

The events are an opportunity for VP Research Baljit Singh and the OVPR leadership to connect with and hear from staff, students, and especially researchers at USask.

Mark your calendars. Everyone is welcome.

The 2022-23 Campus Conversations will be held in person from **noon to 12:45 p.m.** on:

- Jan. 25, 2023 at Convocation Hall;

- Mar. 22, at Convocation Hall;
 - May 3, in HLTH GB06; and
 - June 14, at Convocation Hall
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In the news

- Jan. 13 – *CBC News, MSN* - **This service dog isn't a golden retriever or Lab. Is that why this woman wasn't allowed in an Ontario hotel?**
 - Jan. 12 – *Global News, MSN* - **U.S. nixes gas stove ban despite studies showing health risks, dangers**
 - Jan. 9 – *Haaretz, MSN Israel* - **One Small Part of a Human Antibody Has the Potential to Work as a Drug for Both Prevention and Therapy of COVID-19**
 - Jan. 9 – *CBC News, MSN Canada* - **How a former ski hill in southern Alberta has become an important key to climate study**
 - Dec. 27 – *The Globe and Mail* - **Number of Canadians in hospital with COVID has more than tripled since last year**
 - Dec. 26 – *LA Times, MSN* - **In Arizona, Colorado River crisis stokes worry over growth and groundwater depletion**
 - Dec. 25 – *The Globe and Mail* - **The price of pasta is surging, but discounts could be next**
 - Dec. 22 – *LA Times, MSN* - **"Full on crisis" Groundwater in California's Central Valley disappearing at alarming rate**
 - Dec. 16 – *The Globe and Mail* - **NASA mission to measure Earth's surface water**
 - Dec. 15 – *New York Times, Boston Globe, MSN, People Online* - **The Coronavirus May Spread From Corpses, Scientists Report**
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Banner image photo credit: **A Lousy Problem - Literally!** - By Kayla Buhler, PhD student

Images of Research 2022 -- Community Impact (winner)

Funders: Natural Science and Engineering Research Council of Canada, Weston Family Foundation, ArcticNet and Polar Knowledge Canada

Description: Back in 2019, I noticed Arctic foxes at my field site with strange fur loss. When the pandemic hit, I was unable to travel to the Arctic, but scientists and trappers from both Nunavut and Norway (Svalbard) were observing similar fur loss. In 2021, I partnered with trappers in Cambridge Bay and Gjoa Haven to identify the reason for this fur loss, as it impacts the quality of pelts. Turns out that it was a lousy problem! Literally, lice were recovered from foxes in Canada and Norway, which turned out to be a brand-new cryptic species that travels with foxes as they disperse between continents across the Arctic sea ice. An important find for northern trappers!



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