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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!](#)

This Month's Stories



[More than \\$10 million awarded to USask crop research projects](#)

Twenty-nine crop science projects from researchers at the University of Saskatchewan (USask) have received a total of close to \$7.5 million from the Governments of Canada and Saskatchewan and more than \$2.5 million in co-funding from industry partners.

The USask crop research projects received support from Saskatchewan's Agriculture Development Fund (ADF), meant to aid the growth and advancement of the agricultural industry in the province through innovative work solving modern questions in agricultural science.

[USask cybersecurity expert weighs in on AI benefits and risks](#)

A USask cybersecurity researcher and expert says that while artificial intelligence (AI) has been around for a while and is definitely here to stay, there are risks but also many benefits to the world's adoption of this type of technology.



A security researcher, **Dr. Natalia Stakhanova (PhD)** is the Canada Research Chair in Security and Privacy and an associate professor of computer science in the USask College of Arts and

Science, whose research has been focused on practical security solutions to everyday problems.

As the public continues to gain an interest and adopts AI into everyday use, Stakhanova said it's important to recognize AI technology has been around for a long time. Now, it is embedded in our daily lives, even though it is not always recognized.



[USask research tackles food insecurity in the community](#)

Researchers at USask have cooked up a new way to fight local food insecurity in Saskatchewan: a dry soup mix product to be distributed by the Regina Food Bank and the Saskatoon Food Bank & Learning Centre.

To address issues of food insecurity in Saskatchewan, USask researcher **Dr. Michael Nickerson (PhD)**, acting head of the Department of Food and Bioproduct Sciences in the College of Agriculture and Bioresources, partnered with the Food Centre to develop an affordable, easy to make and nourishing soup, using crops grown in Saskatchewan.

Funded by the Global Institute for Food Security (GIFS), the goal of the project was to produce nutritious food products made primarily from pulses and cereals that could respond to moderate to acute malnutrition within high-risk communities.

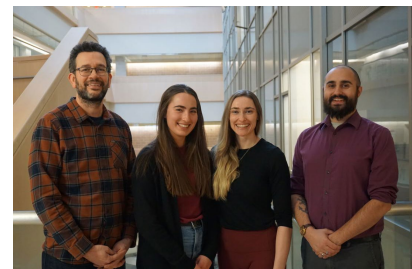
[Joint efforts by USask research team simulate Canada's cannabis consumption](#)

The legalization of cannabis in Canada is driving the demand for scientifically backed insights to inform public health messaging.

Until recently, pre-clinical cannabis research – done without the use of human participants to determine preliminary information such as substance safety and toxicity – has largely involved the injection of cannabinoids in rodent models.

To develop a pre-clinical rodent model that more accurately reflects Canadian cannabis use, USask researchers **Drs. John Howland (PhD)** and **Robert Laprairie (PhD)**, and their graduate students **Tallan Black** and **Ilna Barnard** have conducted studies that utilize a novel cannabis smoke delivery system by burning commercially available strains.

“You can buy the strains we used in stores as a consumer in Canada,” said Howland, professor in the College of Medicine’s Department of Anatomy, Physiology and Pharmacology. “Scientists in Canada are now able to easily use these products in research.”



[USask researchers explore untold history of psychedelics](#)



A USask researcher has led the creation of a new book which compiles stories of the history of psychedelic drugs around the world, both clinically and culturally.

Published by MIT Press, *Expanding Mindscapes: A Global History of Psychedelics* is a compilation of the discovery, use and cultural impact of various psychedelic medicines such as LSD and psilocybin (the compound found in “magic mushrooms”) throughout the 20th century.

Dr. Erika Dyck (PhD), a professor of history in the College of Arts and Science and Canada Research Chair in the History of Health and Social Justice, said psychedelic drugs have a “distinctive” place in medical history due to their role in medical contexts and widespread cultural movements.

Looking for more research stories? [Visit Discovery Digest online.](#)

[Sask. farmers produce some of the world’s most sustainable crops: GIFS at USask study](#)

Saskatchewan farmers are producing some of the least carbon-intensive crops in Canada and the world, as highlighted in a carbon life cycle analysis commissioned by the Global Institute for Food Security (GIFS) at the University of Saskatchewan (USask).



The two-part study commissioned in 2022 examined the carbon footprint from the production of five Canadian field crops – canola, non-durum wheat, field peas, durum wheat, and lentils. It compared these footprints, including their supply chain emissions, to some globally competitive regions across the world that export the same products, including Australia, France, Germany, Italy, and the United States. The results demonstrate that Canadian producers, particularly in Saskatchewan and Western Canada, are producing crops with the least amount of greenhouse gas emissions or carbon dioxide equivalents among regions compared.



[medSask pharmacy guidelines gaining nationwide reach](#)

The pharmacy prescribing guidelines developed by medSask, a non-profit organization to support pharmacists that operates out of USask’s College of Pharmacy and Nutrition, were established more than a decade ago to provide protocols and support for Saskatchewan pharmacists to

prescribe medications for certain minor ailments and self-care conditions without needing to visit a doctor's office.

Since moving to a subscription and licensing-based model, more than 19,000 individual pharmacists and students are now accessing the guidelines through businesses, universities, or independently.

Dr. Charity Evans (PhD) with the College of Pharmacy and Nutrition and the former director of medSask, said the guidelines are one example of how Saskatchewan is leading the way for pharmacists in Canada.

[USask appoints new lentil and faba bean breeder](#)

Dr. Ana Vargas (PhD) has been appointed as the new lentil and faba bean breeder and an Agri-Food Innovation Fund Chair at the USask.



Vargas will lead the successful lentil and faba bean breeding program at the Crop Development Centre (CDC) in the College of Agriculture and Bioresources. To date, the program has released 40 lentil and five faba bean varieties.

Vargas said she looks forward to developing lentil and faba bean varieties that will positively impact farmers and western Canadian agriculture.



[Camelids help USask researchers explore reproductive health mysteries in mammals](#)

The United Nations has declared 2024 as the International Year of the Camelid in recognition of the animals' contributions to maintaining healthy ecosystems around the world.

But for USask scientists, members of the Camelid family have earned their place in the spotlight for another reason: they're fascinating models for reproductive research.

"The camelids are back in North America to stay," said **Dr. Gregg Adams (DVM, PhD)**, a veterinarian and reproductive biology professor at the Western College of Veterinary Medicine (WCVN). "But how they will find their niche in the livestock economy versus companion animals remains to be seen."

[USask student works to crack the code of Long COVID](#)

USask graduate student **Ethan Jansen** is on a mission to help those affected by emerging global viruses and has joined a team of Canadian researchers leading the charge to discover

more about the long-term effects of COVID-19.



Under the expert supervision of VIDO virologist **Dr. Alyson Kelvin (PhD)**, Jansen was involved in the creation of the Sask Long COVID app that was built to collect the experiences of people in Saskatchewan with Long COVID symptoms. Jansen said the project helped to demonstrate the need for more supports and a better understanding of post-viral disease.



[USask student challenging perception of dinosaurs with 'paleoart'](#)



[Strengthening communities of care for persons living with dementia](#)



[Determining the carbon cost of cattle forage production: USask research](#)

Stay connected with USask research news



Make sure to follow the USask Research [Twitter page](#) to stay in-the-know, with exciting research news delivered right to your newsfeed. Don't forget to also follow [USask Research on LinkedIn](#), and [@VPR_USask](#) and [@USask](#) on Twitter for more of the latest research and university news.

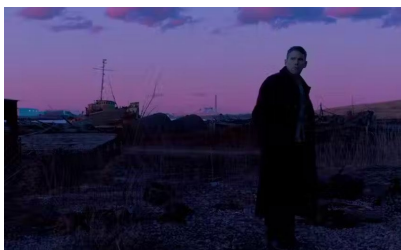
Use the hashtag **#USaskResearch** when sharing USask-related research findings, publications or achievements on social media.

In The Conversation...

[Service dogs play vital roles for veterans, but Canada's lack of standards makes travel and access difficult](#)

By Dr. Colleen Dell (PhD), USask College of Arts and Science and Dr. Linzi Williamson (PhD), USask College of Arts and Science

It is becoming common to see dogs assisting people with their mental health in Canadian communities. Over the past five years, our research lab has been studying the benefits of service dogs for Canadian veterans dealing with post-traumatic stress injuries and other mental health challenges.



[Skip 'Die Hard' this Christmas and watch these 5 films to better understand the climate crisis](#)

By Dr. Jason Maclean (PhD), USask Adjunct Professor, School of Environment and Sustainability

The holiday season is, for many, a time for cherished rituals and down time, including watching movies like It's a Wonderful Life, Elf or Die Hard.

But this season is also a time for reflection on our lives and the world around us beset by conflict — and the worsening climate crisis.

Upcoming events



Atim Maskikhiy/Dog Medicine Art Gallery Tour Launch Event

Join artists, Elders, northern community members, researchers and donors for the Atim Maskikhiy/Dog Medicine Art Gallery Tour Launch Event at Wanuskewin Heritage Park on January 20, 2024.

By exhibiting works created in response to the findings of the 'Healthy Dogs, Healthy Communities' research developed alongside USask's **Dr. Jordan Woodworth (DVM, PhD)**, this event engages viewers from across the province in the project.

- **[Atim Maskikhiy/Dog Medicine Art Gallery Tour Launch Event – Saturday, Jan. 20, 2024, 6:00 – 9:00 p.m.](#)**

Developing tools to enable agricultural research in a digital world – Dr. Scott Noble (PhD)

The College of Agriculture and Bioresources is excited to present the fourth round of the Advancements in Agricultural Research Seminar Series! This series features agriculture researchers from both within and outside AgBio who are changing the face of digital agriculture in Canada.



"Digital Agriculture" provides new opportunities for basic research and breeding programs. It also tends to demand more – more data with more precision, taken more often. Case studies of USask-developed tools to enhance data-collection for crop research will be discussed, along with resulting collaborations and research on extracting more and better information from the data collected.

Register for this seminar and all other upcoming seminars at the link below.

- [Developing tools to enable agricultural research in a digital world – Tuesday, Jan. 16, 2024 – 3:00 p.m.](#)



EDI Discussion Series: Destination Canada, Population You

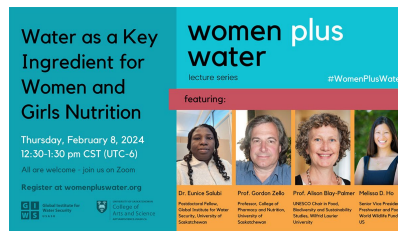
The Government of Canada announced its biggest-ever immigration plan, with 500,000 Permanent Residents (PRs) and 50,000 refugees arriving in 2024-25. Yet this number doesn't scratch the surface of Canada's increasingly complex and byzantine immigration system, comprising Temporary Foreign Workers, International Students, asylum seekers, Ukrainian CUAET visa holders, and many others. This discussion will delve into the intricate challenges embedded in Canada's immigration system. It will scrutinize issues such as systemic bias, the need for a more culturally responsive framework, and reducing barriers. Join us in envisioning what an inclusive immigration system in Canada can look like.

This event is being hosted through Zoom. A confirmation email, including the Zoom connection details, will be sent to the email address provided once you register online.

- [Destination Canada, Population You – Wednesday, Jan. 17, 2024, 12:00 – 1:30 p.m. Saskatchewan time](#)

Women Plus Water - Water as a Key Ingredient for Women and Girls Nutrition

In honour of the United Nations International Day for Women and Girls in Science (February 11), please join us for a conversation about the role that water and climate change play in ensuring adequate nutrition for women and girls. **Dr. Eunice Salubi (PhD)** will host a conversation with **Professor Gordon Zello (PhD)**, **Professor Alison Blay-Palmer (PhD)**, and **Melissa D. Ho** on the topic which will include perspectives both locally in Canada, as well as



internationally.

- [Water as a Key Ingredient for Women and Girls Nutrition – Thursday, Feb. 8, 2024, 12:30 – 1:30 p.m. CST \(via Zoom\)](#)



GIFS Seminar - Complex Genomes Solved

This seminar will highlight research employing HiFi long-read sequencing to support plant improvement and crop breeding initiatives that are benefiting agriculture. We will also show how GIFS' Omics and Precision Agriculture Laboratory (OPAL) applies this technology to vast research areas that impact

food security and beyond.

The event will also address diverse applications for PacBio's Revio, a high-throughput sequencer that can sequence up to 15 times more genomic data per day, accelerating research and development in various fields of discovery.

By registering to attend this event, you are eligible to submit a proposal and be selected for an award of one 25M SMRT Cell of free PacBio sequencing on a Revio system for your next project. Details on how to apply for this grant will be emailed to you once your registration is complete.

- [Complex Genomes Solved – Monday, Feb. 12, 2024, 10:00 a.m. - 12 p.m.](#)
 - This is a hybrid event - online and in-person. In-Person location: Candle Span Room in The Atrium, Innovation Place

NEW - Information for researchers



Meet the TEDxUniversityofSaskatchewan 2024 speakers and performer!

Universities play a vital role in nurturing, empowering, and unleashing the curiosity that allows us to imagine a brighter, more sustainable future. To face humanity's greatest challenges and opportunities we need to ask tough questions, push boundaries, and invigorate impact for meaningful change with and for our communities. The TEDxUniversityofSaskatchewan 2024 theme of 'Courageous Curiosity' does just that.

Meet the speakers and performer who will take to the TEDxUniversityofSaskatchewan 2024 stage [at the link here!](#)

Fisher Scientific preferred supplier for laboratory supplies

USask and its' Saskatchewan Advanced Education Collaborative (SAEC) partners, University of Regina and Saskatchewan Polytechnic, have executed a new contract with Fisher Scientific as its preferred supplier for laboratory consumables, chemicals, small scientific equipment, and

personal protective equipment (PPE) supplies.

Fisher Scientific was awarded the preferred supplier contract through a collaborative, competitive bid process held earlier this year, in alignment with USask's updated Procurement Policy.

The new contract contains many benefits, including:

- limit increased to \$25,000 for direct ordering goods and/or equipment
- delivery prepaid to campuses on stocked, contracted items
- no minimum order fees
- 30 per cent discount from Unity Lab Services on service/labour and 5 per cent discount on parts

The process for ordering will remain unchanged. If you need to set up an account, please refer to the [Where do I buy Lab Supplies and Equipment?](#) Knowledge Base article.

Science Exposed 2024 is now open

Eye-catching images coming from research projects from all fields can be [submitted until January 30, 2024](#). The individuals or groups that have the most successfully combined creativity and science will be awarded one of the many cash prizes. The contest is organized by the Natural Sciences and Engineering Research Council (NSERC) and Acfas.

The goal of Science Exposed is to help foster a science culture in Canada by capturing vibrant research images that showcase the work of our talented research community. These images will help the Canadian population better understand and see, through the same lens as the research community, the work that is being done behind the scenes.

USask 3MT® 2024 Preliminaries - now accepting submissions!

All USask thesis-based graduate students who are enrolled in a Master's or Ph.D. graduate program are invited to compete in the virtual preliminary event for a chance to win!

The 3MT® communication competition challenges students to translate their research and its impact to an audience of non-specialists in just 3 minutes using only one static slide. This competition helps graduate students develop essential communication skills to aid in funding proposals, transitioning into employment, and generating awareness and support for academic research.

The deadline to submit your 3MT® talk is **March 19th, 2024** at 4:30PM CST.

Are you a French-speaking graduate student? CGPS is partnering with the University of Regina and Acfas to promote the annual MT180 competition, or Ma thèse en 180 secondes.

The deadline to submit your MT180 entry is **March 9th, 2024**.

To learn more about these competitions and to access resources to help you craft your presentation, visit: <https://cgps.usask.ca/grad-life/events/3mt-usask.php#top>

In the news

- Jan. 10 – Global News – [**Agriculture carbon footprint study shows the sustainability of Sask. crops**](#)
 - Jan. 10 – CBC News Online – [**Saskatoon police podcast raises questions about transparency and how authorities share data**](#)
 - Jan. 9 – CBS News – [**The bird flu has killed a polar bear for the first time ever – and experts say it likely won't be the last**](#)
 - Jan. 3 – CTV News – [**More than 70% of Canada is 'abnormally dry.' Here's why**](#)
 - Jan. 3 – CBC News Online – [**Furnace or heat pump? Why not heat your home with both?**](#)
 - Dec. 28 – CBC Radio – [**Labour researcher says class size part of working conditions as contract talks between teachers and the province stall**](#)
 - Dec. 21 – CBC Radio, CTV News – [**Sask. professor compiles research in effort to explore psychedelics**](#)
 - Dec. 19 – CBC Radio, CBC News – [**Canadian Light Source at University of Saskatchewan looks to make vegan alternatives more meat-like**](#)
 - Dec. 18 – Global News, CBC News – [**USask researcher creates 15,000 nutritious soup packets for food banks**](#)
 - Dec. 18 – Global News – [**Grain spoilage research in Sask. to help farmers get the most out of their crops**](#)
 - Dec. 18 – Saskatoon StarPhoenix, Regina Leader Post – [**Opinion: Saskatchewan's ongoing debt crisis of the government's making**](#)
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Banner image photo credit: **What does the fox say?** - by **Dr. Kayla Buhler (PhD)**, recent alumna in Veterinary Microbiology

Images of Research 2023 - *Runner-up, Research in Action*

Many of you have heard of this song that overtook the internet almost a decade ago. Most of my research focuses on wildlife diseases in Nunavut, but I noticed some very interesting sounds while working on arctic fox dens. In general, dogs and other canids with strong family units are thought to have more complex vocalization with lots of quiet sounds for close range communication, while solitary foxes should have a simple vocal repertoire with loud noises for long distance communication. However, video recordings on dens revealed many unique sounds that foxes make while rearing their young, including a range of low frequency noises between parents and pups. So, what does the fox say? The truth is - a lot!

Funders: NSERC, ArcticNet, Weston Family Foundation, Earth Rangers



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