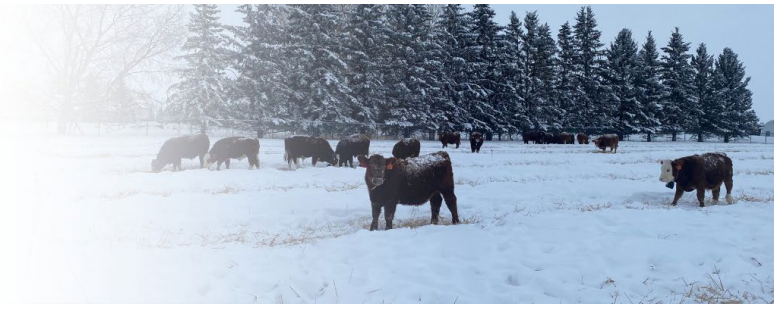


November 2024 - Issue 82

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!**

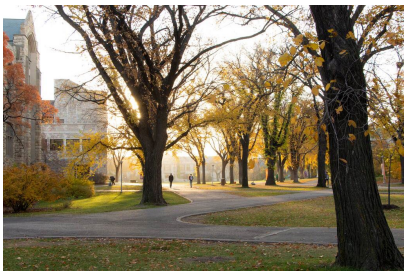
NEW - USask Signature Series Podcast

World-leading research and innovation - right in the heart of Canada.

The **USask Signature Series Podcast** explores the cutting-edge research taking place at the University of Saskatchewan across the university's Signature Areas of Research.

You can find the podcast on all major podcast hosting services. The first full episode will be out Tuesday, Nov. 19!

This Month's Stories



USask makes strides in international subject rankings

The University of Saskatchewan (USask) has ranked in the top 100 universities in the world in four subject areas, according to the ShanghaiRanking 2024 Global Rankings of Academic Subjects (GRAS).

USask notably earned top 100 spots in Water Resources (29th), Agricultural Sciences (51-75th), Earth Sciences (76-100th) and Veterinary Sciences (76-100th).

This marks an improvement in last year’s rankings, when USask had two placements in the

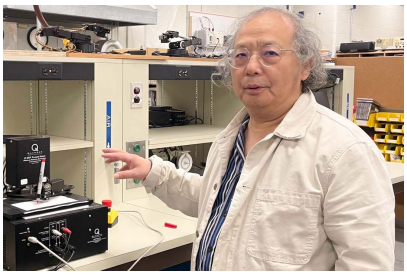
top 100.

The GRAS includes more than 1,900 universities around the world in 55 different subject areas. USask ranked in the top 200 worldwide in 10 different subjects in total.

USask and MN–S government agreement supports high-impact research with and for Métis communities

The agreement, signed in May 2024, is a first-of-a-kind partnership that outlines the commitment of both parties to establish the Métis Nation–Institute for Research and Governance (MN-IRG) at USask. **Dr. Kurtis Boyer (PhD)**, chair in Métis Governance and Policy at the Johnson-Shoyama Graduate School of Public Policy and director of the forthcoming institute, said the agreement will "support research that is conducted at USask in partnership with the MN–S."

The MN–IRG builds on the relationship between USask and the MN–S government to protect and promote Métis identity, culture, values, and language, drive high-impact research initiatives and train the next generation of scholars and leaders.



USask researchers first to move nanorobots through blood vessels

From repairing deadly brain bleeds to tackling tumours with precise chemotherapy, micro/nano-robots (MNRs) are a promising, up-and-coming tool that have the power to substantially advance health care.

However, this tool still has difficulty navigating within the human body—a limitation which has prevented it from entering clinical trials.

USask College of Engineering professor **Dr. Chris Zhang (PhD)** and two PhD students (**Lujia Ding, N.N Hu**) along with two USask alumni (**Dr. Bing Zhang (PhD), Dr. R. Y. Yin (PhD)**) are the first team to develop a highly accurate mathematical model that optimizes the design of MNRs which improves their navigation, allowing them to travel efficiently through the bloodstream. Their work was recently published in Nature Communications.

USask signs MOA with national groups to advance nuclear research, innovation

USask, Atomic Energy of Canada Ltd. (AECL), and Canadian Nuclear Laboratories Limited (CNL) have signed a Memorandum of Agreement (MOA) to collaborate on nuclear

research and innovation.

The partnership, housed within USask's College of Engineering, aims to leverage the strengths of each institution to advance nuclear science and technology, grow One Health applications, enhance educational opportunities, access specialized infrastructure and contribute to the development of sustainable energy security and solutions.

"Being able to provide students and researchers with unparalleled opportunities to explore nuclear science will enable us to lead the global shift towards more efficient energy sources and create advanced technologies that benefit all areas of health care," said USask Vice President Research, **Baljit Singh.**

USask welcomes CFI president and CEO

On Nov. 6-7, USask was proud to host to the Canada Foundation for Innovation's (CFI) president and CEO Dr. Sylvain Charbonneau (PhD), along with the vice-president programs and planning, Dr. Mohamad Nasser-Eddine (PhD).

USask is the home and proud leader of four recipients of support from the CFI Major Science Initiatives Fund (MSIF), a program designed to bolster ongoing operating and maintenance needs of research facilities of national importance. The Canadian Light Source (CLS) synchrotron research facility, the Vaccine and Infectious Disease Organization (VIDO), the Super Dual Auroral Radar Network (SuperDARN) and Global Water Futures Observatories (GWFO) are all nationally significant research initiatives supported by the CFI-MSIF.

Looking for more research stories? Visit Discovery Digest online.

USask researcher works with Amazonian youth to protect tropical forests

Dr. Jim Robson (PhD) in USask's School of Environment and Sustainability (SENS), is collaborating with Tropenbos International and the Instituto Boliviano de Investigación Forestal (IBIF) (Bolivian Forest Research Institute) through the *Youth it or Lose it* program.

“The program empowers young leaders from the Amazon region to lead the way in shaping their own futures,” said Robson, adding that youth leaders from Bolivia, Suriname and Colombia gathered in mid-October in Suriname. “They exchanged ideas and worked on youth-led projects and initiatives that, in their own words, can deliver ‘solutions aimed at creating opportunities for us, that come from us.’”

USask research contributes to book on living well with dementia

The recently released co-authored book, *How to Live Well with Dementia: Expert Help for People Living with Dementia and their Family, Friends, and Care Partners*, builds on insight drawn from research conducted at USask.

Dr. Megan O’Connell (PhD), professor in the Department of Psychology and Health Studies in USask’s College of Arts and Science, clinical psychologist at the Rural and Remote Memory Clinic in the Canadian Centre for Rural and Agricultural Health (CCRAH), and co-investigator of the Rural Dementia Action Research (RaDAR) program, is a co-author on the book.

The book offers guidance and understanding about different aspects of dementia and is written for people living with it and those in their support network, including family and friends, health and social care professionals, and those whose lives are touched by dementia.

Going batty: Debunking myths and uncovering facts about one of Halloween’s spookiest critters

They’re quiet hunters, they’re the inspiration for one of the world’s most popular superheroes and they’re all over Halloween decorations – but how much do we really know about bats?

Dr. Arinjay Banerjee (PhD) is a researcher with VIDO at USask, as well as an adjunct professor of veterinary microbiology in USask’s Western College of Veterinary Medicine (WCVM) and a co-lead of the USask One Health Signature Area of Research.

He and his PhD student, **Dr. Rita Quintela Tizón (DVM)**, are studying the intricacies of bats. Research Profile and Impact caught up with the pair to debunk some myths about these mysterious creatures of the night.

Renowned One Health, AI researcher receives top USask honour

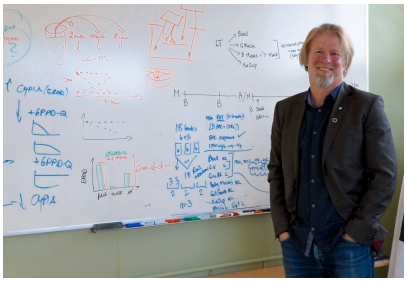
Dr. FangXiang Wu (PhD), a world-renowned pioneer in

computational intelligence for medical/biological data analytics and widely recognized for his seminal contributions to biomarker discovery, medical image analysis and health informatics, is the USask Distinguished Researcher for fall 2024.

“It’s amazing and exciting to be awarded this top honour,” said Wu, who is a professor in USask’s College of Engineering Department of Mechanical Engineering and Division of Biomedical Engineering, and also the College of Arts and Science’s Department of Computer Science.

Wu’s expertise in computational intelligence refers to training computer systems to develop human-like intelligence, mimicking such things as perception, reasoning and adaptation. It involves using algorithms to capture hidden knowledge from data to help humans make complex decisions.

For the love of fish: Five questions with USask’s Markus Hecker



Dr. Markus Hecker (PhD), professor in SENS and member of the Toxicology Centre at USask is no stranger to the Canadian Research Chair (CRC) program.

For a decade, he held a Tier 2 CRC in Predictive Aquatic Ecotoxicology for his research in aquatic ecosystems. Through that work, Hecker’s contributions have transformed the way toxicologists think about and conduct their research. Recognizing his status as a world leader in his field, in 2023 Hecker received a Tier 1 CRC in Predictive Toxicology and Chemical Safety.

Hecker is part of a larger group of researchers from North America and Europe that have been pushing a unique framework which can be used to generate toxicological results quickly, economically and more ethically.

Harvesting triple wins

In addition to being very dynamic and subject to changing conditions, food systems are deeply interlinked with the environmental, economic and social spheres in which they are embedded.

In recognition that each change made in agricultural production brings unique challenges and opportunities that affect outcomes in all areas of impact, **Dr. Christy Morrissey (PhD)**, professor in the

Department of Biology in the College of Arts and Science at USask, seeks to advance our understanding of the value of ecosystem services while providing farmers with guidance and tools for making land-use decisions.

The work of the Prairie Precision Sustainability Network has “the goal to find that sweet spot, where you're doing something that is not only good for the environment but also brings social and economic benefits,” she says. “That’s one of the reasons this project has been taking off, because it ticks all three sustainability boxes.”

Four things to know about SuperDARN at USask

Located at USask, SuperDARN is monitoring space weather and studying its impacts on Earth.

With more than 35 radars interspersed across the world, SuperDARN keeps tabs on these space weather events by monitoring changes in the charged particles that create the upper layer of the earth’s atmosphere known as the ionosphere.

Dr. Kathryn McWilliams (PhD), director of SuperDARN Canada, has been with the project since the beginning. As an undergraduate student, McWilliams helped build the Saskatoon radar site. Earning both her bachelor’s and master’s degrees at USask, McWilliams returned after her PhD to become the first tenured female faculty member in the physics department.

USask scientists explore honey bees’ diverse foraging habits on Prairies

Veterinary researcher finds link between chlamydial infections and equine abortions

Tissue explants offer promising alternative for swine influenza research

Stay connected with USask research news

Make sure to follow the USask Research **Twitter/X 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/X 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*

Being involved in *The Conversation* is a unique and renowned avenue for sharing research and study with both colleagues and the public. We strongly encourage researchers to explore *The Conversation* as a way to share and distribute their expertise!

Upcoming events

Participate in USask's inaugural One Health Symposium

The One Health Symposium celebrates and highlights the outstanding One Health-based research being conducted at USask. This coming together across disciplines will serve as a forum for learning, discussion and the provoking of new ideas and collaborations. The symposium is hosted by USask's One Health Signature Area of Research, whose interdisciplinary work addresses the interconnectedness and interdependence between human, animal and environmental health.

This one-day event will be held on November 23 in USask's Health Sciences Building.

- One Health Symposium – November 23, 2024 – Health Sciences Building. Register at the **link here!**

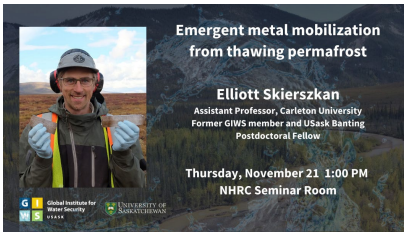
Workshop – Selling Your Research: Creating Engaging

Presentations

Perfect for students and faculty alike, don't miss this interactive skill-building workshop with Julia Topinka and Andrew Betker, business implementation specialists at the Research and Implementation Branch of the Ministry of Corrections, Policing and Public Safety.

Email **forensic.centre@usask.ca** to register!

- Creating Engaging Presentations workshop – November 27, 2024, 1 to 3 p.m. – Arts Building Room 108



Research seminar – Emergent Metal Mobilization from Thawing Permafrost

The Global Institute for Water Security (GIWS) is hosting a talk on emergent metal mobilization from thawing permafrost with **Dr. Elliot Skierszkan (PhD)**, assistant professor at Carleton University, on Thursday, November 21 at 1 p.m. in the seminar room at the National Hydrology Research Centre.

Elliot is a former USask Banting Postdoctoral Fellow and a former member of GIWS. No registration required. For more information please visit **this link**.

- Emergent Metal Mobilization from Thawing Permafrost – November 21, 1 p.m. – National Hydrology Research Centre seminar room

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Lecture – Deep Groundwater, Deep Time

Join the 2025 Darcy Lecturer, **Dr. Grant Ferguson (PhD)**, professor with SENS and the Department of Civil, Geological and Environmental Engineering, for the lecture: "Deep Groundwater, Deep Time" on Wednesday November 27, 2 p.m. at Louis' Loft.

This event is hosted by the GIWS. Registration is required, for more information please visit **the website**.

- Deep Groundwater, Deep Time – November 27, 2024, 2 p.m. – Louis' Loft

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NEW - Information for researchers

If you have any important information for USask researchers, please contact research.communications@usask.ca!

Submitting to Discovery Digest

If you would like to submit a research-focused event or news item for consideration for Discovery Digest, please submit a link and a description of no more than 150 words to **research.communications@usask.ca** with the subject line "Submission – Discovery Digest," along with the month and year you are submitting for.

Please indicate whether your submission is a recommendation for a news item, event or information for researchers. If you would also like to submit a photo, please make sure it is a 3:2 aspect ratio image.

The Discovery Digest goes out on or as close to the 15th of each month as possible. **Please ensure any submissions are sent in by at least the 8th of each month to be considered for inclusion.**

In the news

- Nov. 14 – MSN News, The Canadian Press – **Build vaccine stockpile, use wastewater testing for H5N1 bird flu, experts urge**
- Nov. 13 – CBC News – **Avian flu has been confirmed in Canada. What does that mean for you?**
- Nov. 8 – CBC News – **RFK Jr. wants to stop putting fluoride in drinking water. Here's what scientists say**
- Nov. 7 – PBS News, Yahoo! News – **CDC calls for expanded testing for bird flu after blood tests reveal more farmworker infections**
- Nov. 4 – Interesting Engineering – **Berry-flavored vapes paralyze lung immune cells more than non-flavored: Study**
- Nov. 4 – The Globe and Mail – **AI-powered tech helps amateur athletes train like the pros**
- Oct. 30 – CBC News – **U of S issues health alert for whooping cough; experts encourage adult immunization**
- Oct. 30 – Saskatoon StarPhoenix, Regina Leader-Post – **Sask. voter turnout rate lingering near 50 per cent 'a problem': Expert**
- Oct. 25 – CBC News – **Representation, strategy or both? Sask. election sees increase in racialized immigrant candidates**
- Oct. 23 – Global News – **University of Saskatchewan synchrotron fighting antibiotic-resistant bacteria**

Banner image photo credit: **Winter Embrace: Cattle Swathgrazing in Snow -** by **Somtochukwu Obiora,** M.Sc Student, Department of Animal and Poultry Science, College of Agriculture and Bioresources

Images of Research 2024 - *Runner-up, Research in Action*

I see cattle having fun doing what they know best: grazing. While most animals and we humans would love to stay away from the winter cold, these cattle are grateful to be in the field provided there is forage. Traditionally, they would have been fed in barns, but years of continued research have made it possible to continue grazing into the winter months. Having groups of these cattle graze on swathes of monoculture oat and other groups on polycrop mixture (oat, forage pea, and brassicas) tells a lot about the direction of this research aimed at comparing forage systems (monoculture or polyculture) for a successfully extended grazing.

UNIVERSITY OF SASKATCHEWAN

BE WHAT THE WORLD NEEDS

We want your feedback! **What do you think of Discovery Digest?**

You are receiving this email because you are a student, faculty or staff at USask. Questions? Comments? Send an email to **Research Profile and Impact.**