Discovery Digest

BE WHAT THE WORLD NEEDS

September 2023 - Issue 68

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

Top scholars contribute to USask's strong international rankings

The University of Saskatchewan (USask) recently achieved a ranking of 301-400 globally in the ShanghaiRanking Consultancy's Academic Ranking of World Universities (ARWU) out of more than 2,500 institutions around the world. According to USask's calculations, the institution achieved a rank of 358th in the world – an increase from last year's rank of 370th.

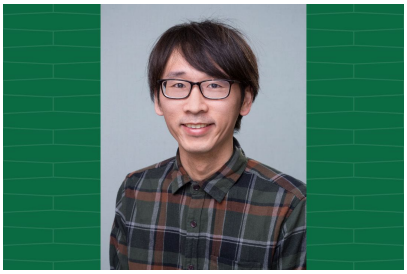
ARWU ranks universities based on six indicators categorized across four different criteria. USask significantly improved its score in 2023 in the "highly cited researchers" indicator, doubling the number of qualifying researchers since last year's ARWU listing.

Genome Canada supports innovative USask agricultural research

Nine Interdisciplinary Challenge Teams (ICTs), a part of Genome Canada's Climate-Smart Agriculture and Food Systems initiative (CSAFS), were announced on Wednesday, September 6. These projects from across Canada are meant to explore innovative and sustainable solutions for Canada's food chain and agricultural production.

Dr. Jon Bennett (PhD), an associate professor in USask's College of Agriculture and Bioresources, is the co-lead of one of USask's projects, with the support of **Dr. Sean Asselin (PhD)** with the Agriculture and Agri-Food Canada (AAFC) Swift Current Research and Development Centre.

The multi-pronged project spearheaded by Bennett will examine the benefits of species and genetic diversity in Canadian grasslands – more specifically the non-market benefits of integrating native plant species into pastureland used by agricultural producers.



GIFS researchers at USask identify protein that helps tell plants 'no' when nitrogen is low

Research led by a post-doctoral fellow at the Global Institute for Food Security (GIFS) at USask is shedding new light into how a protein helps plants acquire nitrogen and other important nutrients for growth.

Dr. Mutsutomo Tokizawa (PhD), a post-doctoral research fellow at GIFS, is the lead author of a new study with Dr. Leon Kochian (PhD), Canada Excellence Research Chair in Global Food Security at USask and research group lead at GIFS. The researchers have identified a novel regulatory mechanism that helps plant roots conserve resources in nitrogen-deficient soils and use them for enhanced growth of the tap root, which can grow deeper into the soil in search of areas with higher concentrations of the nutrients.

USask helps lead promising Parkinson's disease research

Like many Canadians, **Dr. Changiz Taghibiglou (PhD)** has seen first-hand the devastating effects of Parkinson's disease. Backed by promising new research, the USask scientist is determined to help.

Taghibiglou's promising new findings were recently published in The International Journal of Molecular Sciences. Building on the success of Taghibiglou's concussion treatment technique published in 2018, his research team's low field magnetic stimulation (LFMS) technique has now been proven effective in the fight against Parkinson's in preliminary studies.

USask water researcher earns prestigious recognition as new RSC scholar

Dr. Helen Baulch (PhD), an associate professor and the assistant director academic (internal) at the USask School of Environment and Sustainability, has been announced as a member of the Royal Society of Canada's (RSC) College of

New Scholars, Artists and Scientists — a prestigious achievement celebrating excellence in research.

The RSC College of New Scholars, Artists and Scientists is intended to recognize researchers who have "begun demonstrating leading scholarly, research or artistic excellence within 15 years of having completed their post-doctoral program or its equivalent," according to the RSC website.

Baulch's research focuses primarily on the societal tradeoffs of maintaining and using bodies of fresh water, such as lakes and wetlands in Saskatchewan.

Looking for more research stories? Visit Discovery Digest online.

USask researchers improving indoor air quality and energy efficiency

USask's College of Engineering's associate director of research, **Dr. Jafar Soltan (PhD)**, and interim dean, **Dr. Carey Simonson (PhD)**, have received funding from the Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant program to further work into projects aiming to clean indoor air and make purification systems more efficient.

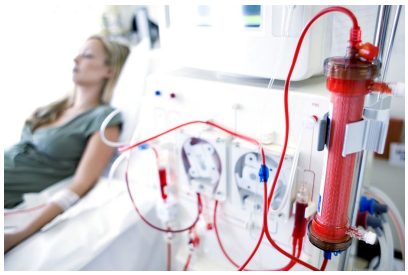
USask researchers received more than $8.7 million from the NSERC Discovery Grant program in the most recent round of awards, with 36 different projects receiving funding.

New USask research chair focuses on improving Indigenous children's wellness

Newly appointed Tier 2 Canada Research Chair (CRC) **Dr. Wendie Marks (PhD)** at USask is investigating links between obesity in Indigenous children and their exposure to environmental factors during pre-conception, prenatal, or early postpartum periods.

Marks, who is also an assistant professor in pediatrics at USask's College of Medicine, is especially interested in learning the underlying factors that contribute to the high prevalence of obesity of Indigenous children on the Prairies, where obesity levels of Indigenous persons on reserves exceed the Canadian average for both off-reserve members and the non-Indigenous population.

Improved treatment for patients with kidney failure



USask researchers have developed a better membrane for dialysis machines that could lead to safer treatment, improved quality of life for patients with kidney failure.

Over two million people worldwide depend on dialysis or a kidney transplant, according to the National Kidney Foundation. Globally, the number of individuals facing kidney failure has climbed 35 per cent since 2009 and nearly half (46 per cent) of the new patients are under age 65.

Using the Canadian Light Source (CLS) at USask, researchers have developed a better membrane for dialysis machines that could lead to safer treatment and improved quality of life for patients with kidney failure.

New USask Banting fellow delves into women's contributions to medical history

Dr. Zoë Dubus (PhD) earned her post-doctoral degree in the history of medicine at Aix-Marseille Université in Marseille, France studying the history of the use of psychotropic drugs in Europe.

Dubus said she is excited to have the support of the Banting fellowship to expand her research in Saskatchewan to include more elements of gender history.

"It's important for me to speak about this and give other women, little girls, examples of very strong women in science and medicine," she said.

USask project to advance plant pathogen research receives nearly $800,000

A proposal led by **Dr. Chris Todd (PhD),** head of the USask College of Arts and Science's biology department, to take the Environmental Plant Pathogen Interaction Centre (EPPICentre) to its next phase was awarded $796,910 in funding from the national John R. Evans Leaders Fund (JELF).

The fund, run through the Canadian Foundation for Innovation (CFI), supports research and research infrastructure for innovative projects in Canada. The funding for Todd and other USask researchers was part of more than $113 million awarded to almost 400 research infrastructure projects across the country.

New vascular health research supported by USask fellowship

Dr. Thomas Jurrissen (PhD) was the successful recipient of the 2023 Misiwêskamik International Postdoctoral Fellowship awarded by USask. The two-year fellowship aims to attract strong international researchers to USask as part of the university's International Blueprint for Action.

Jurrissen completed his PhD at the University of Missouri where his research focused on improving vascular health in patients with Type 2 diabetes.

As Jurrissen puts it, endothelial cells, which line the inside of all blood vessels in the body, are impaired in patients with Type 2 diabetes. This impairment, called endothelial dysfunction, is a hallmark of patients with Type 2 diabetes and involves the decreased response of the vessels to dilate and protect the blood vessels from inflammation.

USask concert will mix music and math

At a free concert at USask this month, audience members will be part of a bold experiment in conveying mathematical meaning through music.

On Wednesday, Sept. 20, the Saskatoon Jazz Orchestra and guest musicians will debut new music by Canadian composer Jeff Presslaff, based on the work of USask quantum science researcher **Dr. Steven Rayan (PhD),** a professor in the Department of Mathematics and Statistics in the College of Arts and Science and the lead of the Quantum Innovation Signature Area of Research.

Composers have been finding musical ideas in mathematics for centuries, but the team behind this project has higher ambitions. The new compositions are not just inspired by math, said Rayan; they are a direct translation.

USask scientist leads 'living laboratory' project for Canadian cow-calf herds

A veterinarian, beef cattle specialist and cow-calf producer from USask is leading a nationwide cow-calf surveillance initiative with the support of other researchers on campus and across Canada.

The Canadian Cow-Calf Health and Productivity Enhancement Network (C3H-PEN) is a surveillance and research network of cattle herds across Canada that will operate for five years from 2023 to 2028. Led by **Dr. Cheryl Waldner (DVM, PhD)**, a professor at the Western College of Veterinary Medicine (WCVM), the network will serve as a "living laboratory" for 150 cattle herds across the country.

GIFS researcher supports international team effort to sequence earliest domesticated wheat genome

More than two dozen scientists have contributed to a project that that has sequenced and characterized genomes of wild and domesticated einkorn, the world's first domesticated wheat species.

Dr. Raju Datla (PhD), program lead, resilient agriculture, in GIFS at USask is one of the contributors to the initiative, providing molecular genetics and genomics expertise to support the analysis.

Aspiring researchers show work, gain experience at SURE symposium

Treating diarrhea in pigs amid an antimicrobial resistance crisis

USask graduate students receive nationally funded scholarships to support agricultural research

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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 follow **USask Research on LinkedIn**, **@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.

ICYMI: This year's TEDxUniversityofSaskatchewan videos are now available!

USask is home to pioneers in discovery who are improving lives, expanding opportunities, strengthening social cohesion and protecting the environment. In the spirit of ideas worth spreading, they took to the TEDx stage in January with compelling stories of ambition and achievements, sharing their voice and vision to be what the world needs.

Whether you missed the event or just want to re-watch the amazing talks, **find all the videos online**.
Learn more **about the event**.

In the *Conversation*...

New research may point the way towards frost-free heat pumps

By: Amirreza Mahmoudi, USask PhD Candidate, College of Engineering

Heat pumps are essential for the large-scale adoption of more carbon friendly heating systems and recent research suggests a way forward for reducing one of the technology's biggest hurdles — frost.

Saskatchewan naming and pronoun policy: The best interests of children must guide provincial parental consent rules

By: Patrick Richards, USask PhD Candidate, College of Education; and Dr. Conor Barker (PhD), Mount Saint Vincent University

Elected officials must consider relevant research and legal context when shaping education policies. Otherwise, they risk destabilizing classrooms and harming students.

Montana youth win unprecedented climate case: What does

[this ruling mean for Canada?](#)

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

An unprecedented win for climate justice in Montana has the potential to send reverberations around the world, including here in Canada.

Upcoming events

USask Agriculture Research Day 2023

On **Wednesday, September 20**, over 60 posters displaying student research from across campus will be on display from 9:00am to 3:00pm in the Agriculture Building 2nd floor pedway. Students will be at their posters over the noon hour to talk to you about their research!

Please come and show your support for our researchers of tomorrow.

- USask Agriculture Research Day - **Wednesday, Sept. 20, 9 a.m. to 3 p.m.**

Name Celebration and Open House - Canadian Centre for Rural and Agricultural Health

The Canadian Centre for Rural and Agricultural Health (CCRAH) is pleased to welcome past, present, and future colleagues, community collaborators, non-profit and government colleagues, students, staff, and supporters to celebrate with us on **Tuesday, September 26 at 10:30 a.m.** in the E Wing Atrium of the Health Sciences building at the University of Saskatchewan.

The Centre's new name is a clear reflection of its depth of research, service, and outreach to support improved health outcomes for rural and agricultural people in Saskatchewan, across Canada, and around the world. Please join us for the celebration!

- CCRAH Name Celebration and Open House - **Tuesday, September 26, 10:30 a.m.**

USask College of Arts and Science Clinical Psychology Graduate Program Expansion Launch

The Saskatchewan Ministry of Advanced Education has made a multi-million-dollar commitment to expand the Clinical Psychology program and undertake renovations, which will include lab spaces, testing supplies for training courses, and expansion of the University of Saskatchewan Psychology Clinic (USPC).

The event will take place on **Thursday, Sept. 21 from 4 p.m. to 7 p.m. at Louis' Loft.**

- Please email **karlene.britton@usask.ca** to RSVP

NEW - Information for researchers

LAST CHANCE! DEADLINE TO REGISTER IS TODAY!
TEDxUniversityofSaskatchewan 2024: Call for speakers and performers

Universities play a vital role in nurturing, empowering, and unleashing the curiosity that will allow us to imagine a brighter, more sustainable future. In the spirit of ideas worth spreading, USask will host a TEDx event. We are looking for pioneers in discovery who are improving lives, expanding opportunities, strengthening social cohesion and protecting the environment to share their voice and vision. This year's theme is, "Courageous Curiosity".

To apply to speak or perform at this year's event, **fill out this form** by Sept. 15. More details on the event will be shared soon.

You can stay up-to-date by visiting **research.usask.ca/tedx**.

Learn more about HARVEST

Did you know that the University Library provides a digital repository for the research, scholarly, and artistic outputs of the USask community? It is called **HARVEST**. preserv your articles, book chapters, presentations (and more!) ong-term, and make them discoverable and freely accessib le to anyone anywhere in the world. Repositories like HARVEST are the ideal place to share research outputs that may not otherwise be published or preserved such as reports. This is also a way that you can comply with funders' mandates for open access (like the Tri-Agency Policy on Publications) without paying expensive publisher's fees. It is free and legal to self-archive your revised manuscripts in HARVEST. Learn more **here**.

Ready to get started? Reach out to us at **HARVEST@library.usask.ca** to get set up!

In the news

- Sept. 13 – CBC News – **Why green roofs haven't taken root in Saskatchewan**
- Sept. 12 – The Saskatoon StarPhoenix – **Upcycling canola may increase cattle health: U of S research**

Sept. 11 – CTV News, CBC Radio – **U of S researcher studies food programs in schools**

- Sept. 8 – Global News, MSN News – **What Canadians need to know about COVID rapid tests as fall approaches**
- Sept. 6 – USask News, GlobeNewsWire, National Post, Reuters – **GIFS researchers at USask identify protein that helps tell plants 'no' when nitrogen is low**
- Aug. 31 – Global News – **International Overdose Awareness Day shows reality of Saskatchewan drug use**
- Aug. 28 – The Globe and Mail – **Meet the deceptively pretty creeping bellflower, and the gardeners on a mission to kill it**
- Aug. 27 – NBC News, Yahoo News – **FDA pet food investigation: What to know about diet-related heart disease**
- Aug. 24 – CBC New – **Caribou butts and wolf cameos: How motion-activated cameras may reveal the secrets of a healthy Manitoba herd**
- Aug. 19 – **CBC News – Ottawa announces up to $74M for small modular nuclear reactor development in Sask.**
- Aug. 16 – The Telegraph, MSN News – **Covid-like viruses in Vietnam bats highlights spillover risk**
- Aug. 15 – CBC News – **Self-determination and inclusion central to Indigenous health in Sask., say experts**

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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