Discovery Digest

BE WHAT THE WORLD NEEDS

March 2022 - Issue 50

In this issue: USask researchers reveal that therapy dogs can reduce emergency room discomfort for patients, a USask drama professor builds inclusivity into stage design, how horses may benefit from stem cell therapy, a research team discovers a link between wildfires and the ozone layer, and 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. Feedback welcome!

This Month's Stories

USask study finds dog therapy can reduce ER patients' pain and anxiety

USask research shows therapy dogs can help reduce pain and improve well-being for people treated in emergency rooms. St. John Ambulance therapy dog teams were introduced for 10-minute visits at the Royal University Hospital emergency department in Saskatoon. Patients reported clinically significant changes in pain, anxiety, depression and well-being after the canine intervention compared to treatment without. The research was featured by major news outlets around the world, including *CNN* and *People Magazine Online.*

The research took place under the leadership of Dr. **Colleen Dell** (PhD), USask Research Chair in One Health and Wellness and co-founder of the PAWS Your Stress program, and Dr. **James Stempien** (MD), provincial head, Emergency Medicine. **The full story**. Watch the **USask Research Minute** (1:26) video summary of the project.

USask research collaboration shows increased wildfires may slow recovery of Earth's ozone layer

A new study reveals that an expected increase in wildfires due to climate change may lead to chemical reactions that cause destruction of the Earth's protective ozone layer and slow its ability to recover.

USask physics professors Dr. **Adam Bourassa** (PhD) and Dr. **Doug Degenstein** (PhD), research associate Dr. **Daniel Zawada** (PhD), and PhD student **Kimberlee Dube** along with researchers from major institutions such as the Massachusetts Institute of Technology and the NASA Goddard Space Flight Center have collaborated on a project that assessed chemical changes that occurred in the ozone layer as a result of wildfire smoke. **The full story**.

USask researchers collaborate with Indigenous communities to address health inequities with federal funding

Two USask research teams have been awarded more than $2.8 million in federal funding to address systemic inequities in the lives of Indigenous people in the areas of home life, and mental and sexual health.

Dr. **Amanda Froehlich Chow** (PhD) from the USask School of Public Health will spearhead a community-led, culturally rooted research program that aims to expand sexual health curricula for youth in a way that includes Indigenous teachings. USask College of Medicine Distinguished Research Chair Dr. **James Dosman** (MD) will lead a team of researchers in a project focused on how the mental health of Indigenous peoples can be affected by their life in their houses and in their home communities.

In total, USask research teams were awarded $4,145,226 through the Canadian Institutes of Health Research (CIHR) Project Grant program for work with potential to enhance health knowledge and outcomes. **The full story.**

USask researchers target prostate cancer cells to develop new treatments

Prostate cancer is the most common form of cancer for men in Canada. USask College of Medicine researchers Drs. **Franco Vizeacoumar** (PhD) and **Andrew Freywald** (PhD) are hoping their research will identify targets that lead to effective prostate cancer therapies.

The team, which also involves Drs. **Judy Wong** (PhD) and **Yuzhuo Wang** (PhD) from the University of British Columbia, aims to identify molecules within prostate cancer cells that can be targeted with existing or novel drugs to improve treatment efficiency. The project was awarded $983,026 by the CIHR. [https://The full story.]The full story.

Federal funding invested in research will build cancer prevention tools rooted in Métis culture

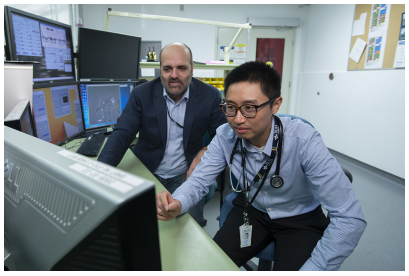
USask College of Medicine researcher Dr. **Gary Groot** (MD, PhD) has been awarded more than $175,000 from three major funding bodies to support a project that seeks to lower cancer rates of Métis peoples by using cultural connection as a prevention tool.

Previous research has identified that the Métis population in Canada is a high-risk and underserved group when it comes to incidences of cancer and prevention efforts. The newly funded project will aim to reduce these incidence rates by creating prevention programs rooted in the home community. **The full story.**

Recreating outer space on Earth

Extreme conditions — severe pressure, intense temperatures, and high levels of radiation— exist all over the Earth and beyond. Dr. **John Tse** (PhD), a Usask professor of physics and Centennial Enhancement Chair in Material Science, is interested in what happens to organic molecules such as water under extreme pressure and temperature.

Using synchrotron technology, Tse has successfully generated extreme conditions on the beamline, offering a new perspective on how water crystalizes. This may help to explain what happens when liquids and other molecules interact in environments that have strong vacuums and extremely low temperatures, such as oil and natural gas pipelines. **The full story**.



USask collaboration key to research funding success

CIHR has awarded $810,000 over five years to a diverse team of USask researchers, led by USask respirologist Dr. **Julian Tam** (MD) and physiologist Dr. **Juan Ianowski** (PhD), that is embarking on an ambitious, three-part project to advance understanding of cystic fibrosis.

The funding will aid the team in exploring cellular processes that occur in the lungs of patients diagnosed with cystic fibrosis, paving the way for potential new ways to treat this chronic and often fatal disease. **The full story**.

Protecting endangered species and habitats

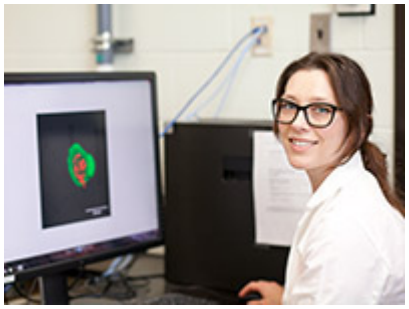
Preserving endangered animal and plant species in Saskatchewan and across Canada requires protecting rare and endangered habitats and ecosystems that support them.

As the United Nations spotlighted World Wildlife Day on March 3—with this year's theme, "Recovering key species for ecosystem restoration"—we profile the work of USask researcher Dr. **Eric Lamb** (PhD), an associate professor in the Department of Plant Sciences in the College of Agriculture and Bioresources and head of the Saskatchewan Plant Community Ecology Lab at USask. Lamb's lifetime of research has covered everything from conservation biology to grazing and fire ecology, with a particular interest in preserving the province's grasslands. **The full story.**

USask research finds substance derived from tire debris is toxic to two trout species

As tire treads wear down and pieces flake off over time, small rubber particles scatter across roads. There, they react with oxidants such as ozone in the air, converting the chemical compound 6PPD in tires to 6PPD-quinone, which washes into waterways along with other source tire particles.

Researchers from USask have reported that exposure to 6PPD-quinone at environmentally relevant levels can also be deadly for rainbow and brook trout, though not for Arctic char or white sturgeon. **The full story.**



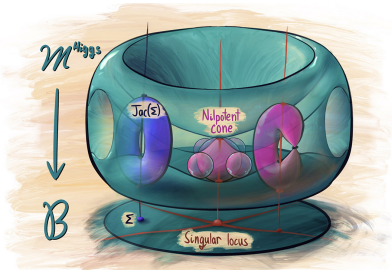
Veterinary researchers report wound healing changes after stem cell therapy in horses

Western College of Veterinary Medicine researchers have published the first equine study to demonstrate changes in wound healing following stem cell therapy. Researchers used intravenous (IV) treatments of multipotent mesenchymal stromal cells (MSCs), extracted from other horses. MSC therapy holds promise for treating limb wounds, a common injury in horses.

PhD candidate and lead author Dr. **Suzanne Mund** (DVM) reported that the study's horses didn't experience accelerated wound closure or improved histologic healing, but healed wounds had smaller immature scar sizes. This result may signal a better repair in terms of cosmetics and function. **The full story**.

USask drama professor aims to make the stage a more inclusive place

USask associate professor of drama **Carla Orosz** is undertaking a research project that will shine a spotlight on a major need in theatre—designing performance staging that is complementary to diverse skin colours. The research will consider all facets of a theatre production—costumes, makeup, accessories, scenery, projection, and lighting— to develop web-based resources to "train the eye" to develop colour palettes for diverse skin colours. The study will work with the Gordon Tootoosis Nīkānīwin Theatre, the only Indigenous theatre company in Saskatchewan, to engage Indigenous artists and youth in the development and outcomes of the project. **The full story**.



Mathematicians build the future of materials through art

Quantum materials may be the fabric of tomorrow's supercomputers, ones that can quickly and accurately analyze and solve problems to a degree far beyond what was previously thought possible. This may be even more so with the use of hyperbolic (warped) crystal quantum material, which has the ability to operate efficiently at less severe temperatures than required for current quantum materials.

The power of mathematics used to study quantum and hyperbolic crystals is significantly extended through the use of tools from geometry and art, says USask mathematician Dr. **Steven Rayan**'s (PhD) recently published paper. The paper is accompanied by hand drawings created by University of Maryland undergraduate student and USask research assistant **Elliot Kienzle**. **The full story**.

USask researcher awarded SSHRC funding to build more engaging online learning platforms

Edwards School of Business associate professor Dr. **Shan Wang** (PhD) has been awarded funding by the Social Sciences and Humanities Research Council of Canada (SSHRC) to investigate how to improve online discussion forums for students on e-learning platforms.

Throughout the COVID-19 pandemic, educational institutions have turned to online learning platforms as a strategy to continue program delivery when in-person meetings were limited, thus making the platforms an integral part of many student experiences. Wang stresses that many online education discussion forums are not fully developed and may not contain the same functionalities as those used in fields such as e-commerce. **The full story**.

Playing video games may enhance reading skills

USask College of Arts and Science graduate student **Shaylyn Kress** and supervisor Dr. **Ron Borowsky** (PhD) analyzed how objects are presented to the player on-screen can influence attention skills that are essential for reading ability. Anticipating visual prompts in peripheral spaces (up, down or side-to-side) may allow people who play video games more frequently to read known words and sound out new words quicker than those who do not play as often. The study highlights the importance of understanding the effects that hobbies can have on the brain, Kress said, and the work could lead to the development of video games that can enhance literacy and other essential skills. **The full story.**

USask research videos in Cree, Dene highlight ideas to build capacity in North

Edwards School of Business associate professor Dr. **Lee Swanson** (EdD) and his team have produced four videos—two each in Cree and Dene—to present the results of a project

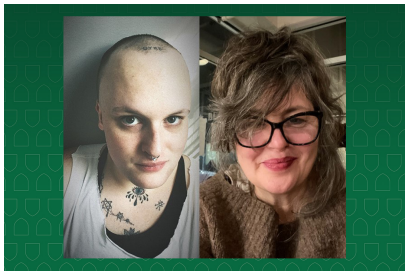
that partnered with seven Indigenous communities to study ways to build social and economic capacity for living well in the province's North.

The communities were full research partners in the project aimed at defining, describing, and assessing the role of entrepreneurship in Saskatchewan's North. Local people see building the region's social and economic capacity as key to securing "the good life," well-being, and prosperity they want. Read **the full story** and watch a **USask Research Minute video** (1:50) that profiles the project.

Using pancake stacks to make better electronics

Scientists are working to develop advanced electronics by taking inspiration from a breakfast favourite and stacking molecules like pancakes. Researchers from the University of Calgary, with help from USask colleagues at the Canadian Light Source, are one step closer to creating solar electronics that are flexible, powerful, and better for the environment.

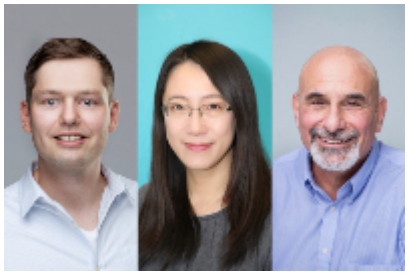
The research team was able to create an organic compound that separates into separate stacks the positive and negative components essential to solar cells. The group published its findings in *Materials Advances*. **The full story**. **Watch a video summary.**



USask galleries welcome Art Auntie to support gender-diverse artists

The Capacitor project, a new programming channel for transgender, non-binary, Two Spirit and gender non-conforming artists in the province, will be hosted by the USask Art Galleries and Collection for the next year.

Funded through a $100,000 grant by the Digital Now initiative of the Canada Council for the Arts, the one-year pilot project is intended to produce the space and capacity necessary for a community that has disproportionately experienced violence, misrepresentation, and exclusion within Saskatchewan and its art spaces. Regina artist **Jaye Kovach** (she/her, they/them) has been hired on a one-year contract to serve as the Capacitor project's Art Auntie. **The full story**.



New federal funding to enrich USask digital agriculture research

A USask Computer Science and Global Institute for Food Security team has been awarded $125,000 in funding from the Canada Foundation for Innovation's John R. Evans Leaders Fund to support the development of innovative greenhouse imaging and computing infrastructure.

Led by Dr. **Lingling Jin** (PhD), Dr. **Ian Stavness** (PhD), and Dr. **Leon Kochian** (PhD), the team will use the funds to build the Green SkEye platform. This made-in-Saskatchewan plant imaging system will be unique, capturing real-time colour and near-infrared images at a fraction of the cost of commercial solutions for imaging plants in specialized chambers or on robotic gantries. **The full story**.

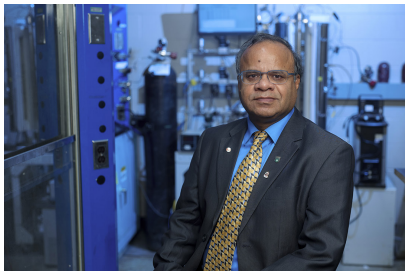
Measuring the amount of carbon in Saskatchewan wetland soils

USask graduate student **Chantel Chizen** is investigating how much carbon is stored in the soil of Prairie wetlands, and what this can mean for environmental carbon management in agriculture. The project is supervised by soil science professor Dr. **Angela Bedard-Haughn** (PhD), who is dean of the USask College of Agriculture and Bioresources.

The project examines how soil carbon levels change across soil zones and with differing amounts of water, salt, and drainage. This information is essential for farmers, as soil carbon content contributes to the overall quality and functional ability of the soil to retain water and nutrients and grow plants. **The full story.**

An algorithm to improve processing of lentils

A USask College of Engineering research team led by Dr. **Venkatesh Meda** (PhD) is using the Mid-IR beamline at the Canadian Light Source to help develop methods that effectively use microwave and infrared energy to speed up the modification process for lentil seeds and make it more selective. Altering starch and protein structure during the modification process can bring desirable changes in the functional and nutritional properties of lentil flour. **The full story.**



Crop, forestry residues fuel USask, industry green project

USask engineering researcher Dr. **Ajay Dalai** (PhD) is working with a Calgary-based industry, Tidewater Renewables, to develop a novel integrated process to produce renewable natural gas (RNG, also called biomethane) from the biomass residue from the province's agriculture and lumber industries.

Monetizing the carbon in biomass to produce renewable biomethane locally instead of allowing methane from decomposition to contribute to climate change is sensible, especially as it also reduces the reliance on non-renewable natural gas, Dalai says. **The full story.**

Partnership expanding work on National Index on Agri-Food Performance

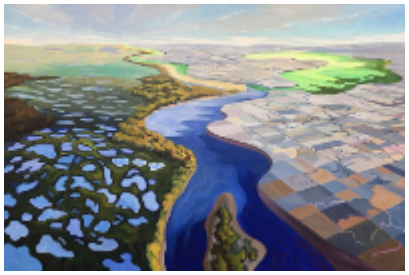
Protein Industries Canada announced a co-investment into the second phase of Canada's National Index on Agri-Food Performance, alongside lead partners Pulse Canada and the Global Institute for Food Security at USask, with the support of David McInnes, coordinator of the index.

The National Index on Agri-Food Performance is focused on developing a set of sustainability indicators and metrics related to the country's agriculture and agrifood industries, which will help increase Canada's competitiveness in the global market. The Index will shine a spotlight on the sustainable practices being utilized in the industry, while also helping identify where improvements can be made. **The full story.**

'We take water for granted': USask professor highlights human relationship with water through artwork

For the last several years, USask professor **Susan Shantz**, a mixed-media artist and faculty member in the Department of Art and Art History in USask's College of Arts and Science, has collaborated with USask scientists as she explores the human relationship with water.

Shantz's new exhibition, Confluence, will be on view at the Moose Jaw Museum & Art Gallery until May 1. The exhibition presents installation, video, embroidered objects and more as it encourages viewers to consider the human impact on water and the interconnectedness of the water systems on the Prairies. **The full story**.



The dollars and 'sense' behind wetland conservation

A team of USask researchers led by Dr. **Eric Asare** (PhD) has built a tool designed to assign an estimated dollar value to wetland services to help farmers, land planners, and policy makers understand the benefits of wetland conservation in agriculture.

Although at first glance wetlands seem to be wasted space across an agricultural landscape, they provide "services" to people and the surrounding landscape, including acting as environmental filters, storing nutrients and water, and providing habitats for wild species. With climate change and tumultuous weather conditions affecting agricultural production, conservation of wetlands and understanding their benefits are vitally important for those who make land use decisions. **The full story**.

USask wastewater COVID detectives' paper is a roadmap for other scientists

USask researchers set up a wastewater monitoring program that's become the province's sole reliable source for data on the prevalence of COVID-19. Now they have published a paper that provides a blueprint for other scientists to emulate their work.

Dr. **John Giesy** (PhD) was the lead author of the paper published Feb. 23 in a special issue of the high-impact journal *ACS ES&T Water*. The paper sets out the research team's standard operating procedures for other scientists to follow, describing in detail how to sample wastewater, perform analyses, ensure quality control, and perform the requisite calculations. **The full story**.

From the Office of the Vice-President Research

Research Life Cycle video now available

If you have ever wondered what the research life cycle looks like at the University of Saskatchewan, **this resource will help you to see an overview**. The video goes through the three broad stages of the life cycle and explains the key events in each stage. This video will show you where you fit in the continuum. **The**

knowledge base article is included here, and can be accessed by USask staff and faculty with a valid NSID.

OVPR Multi-Year Service Planning Initiative

The Office of the Vice-President Research (OVPR) at USask provides visionary leadership and strategic direction to the university's research, scholarly, and artistic works enterprise.

The OVPR has launched a "**multi-year service planning initiative**" which aims to foster continuous improvement and resourcing of the programs, services, and supports we offer USask scholars. Please consider sharing your suggestions on areas for enhancement by attending one of several engagements organized for USask scholars in March 2022.

Further information on this initiative and campus engagements can be **viewed online by clicking here**.

Awards and Recognition

As we continue to revitalize the USask awards and recognition process, Research Profile and Impact is working on updating the **external awards listing** and are seeking nominees for the following awards:

Royal Society of Canada Awards – Deadline Mar. 31

NSERC Prizes – Deadline Apr. 1

L'Oréal Canada For Women in Science Research Excellence Fellowships – Deadline Apr. 14

If you are interested in pursuing a potential nomination, please reach out to **research.communications@usask.ca** to discuss what support is available.

Telling your research story

USask "Images of Research 2022" - LAST 24 HOURS to submit

Show us the beauty in your research by submitting an image to the 2022 Images of Research competition. Enter an image in one of five categories for a chance to win cash prizes, including Viewer's Choice and Best Description.

After submitting, vote for your favourite images from Mar. 17-31 to determine who will be crowned "Viewer's Choice". Visit **Research.USask.ca** to submit, to vote and for full contest details.

[www.linkedin.com/company/usask-research-profile-impact]

Sharing USask research on social media

Use the hashtag **#USaskResearch** when sharing about USask-related research findings, publications or achievements on social media. Using our hashtag will allow OVPR and USask to find your posts and share them on our own channels.

Don't forget to follow **@VPR_USask** and **@USask** on Twitter for the latest research and university news. Follow the USask Research Profile and Impact **LinkedIn page** to stay in the know, with exciting research news delivered right to your newsfeed.

In THE CONVERSATION

How white Christian nationalism is part of the 'freedom convoy' protests

USask adjunct professor of religion and culture, Dr. **Christine Mitchell** (PhD)

White Christian nationalists are people who combine American-style white evangelicalism with Canadian nationalism to declare themselves as the only authentic Canadians.

Write about your own research in The Conversation

USask is a founding member of The Conversation Canada, an online academic journalism hub/newswire where researchers write plain-language editorials and explainer articles about their research. Want to reach a broad audience with your research? Consider pitching 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 Research Profile and Impact.**

Upcoming events

Upcoming events are now featured in the USask Office of the Vice-President Research website event calendar for your convenience in finding events of interest to attend. **Visit the full calendar here**. Upcoming events include:

Mar. 24-25 - Emerging Trends in Infectious Diseases: Preparing for the Next Generation of Pathogens Research Symposium

Mar. 25 - The Big Data Revolution in the Canadian Agricultural Sector: A Symposium on Opportunities, Challenges, and Alternatives

Mar. 27-28 - **27th National Congress on Rural Education in Canada**

Mar. 30 - The Conversation Canada - Tips for Pitching and Writing

In the news

- The month's top stories:
  - **USask study finds dog therapy can reduce ER patients' pain and anxiety** was featured by 125 media outlets, including *CNN, People Magazine Online*, and the *Independent* and was seen by an estimated 300 million people.
  - **USask research finds substance derived from tire debris is toxic to two trout species** was featured by 15 media outlets including *Science Daily* and *Education News Canada* and was seen by an estimated 6.8 million people.
  - **The dollars and 'sense' behind wetland conservation: USask research** was featured in 10 media outlets including *The Globe and Mail* and was seen by an estimated 3.5 million people.
- Other USask research has also been featured in:
  - Feb. 15 – *WCVM Today* - **Unravelling the umbilical cord**
  - Feb. 16 - *What about Water?* podcast - USask Global Institute for Water Security - **Tasha Beeds: Walking With Water**
  - Feb. 17 – *Minute Insight: Info Pharma Intelligence* - **U Of Saskatchewan And McGill Collab On Novel Synthetic Bone Graft**
  - Feb. 18 – *Canadian Encyclopedia* – **Remarkable Scientists and Indigenous Researchers**
  - Feb. 23 – *Saskatoon StarPhoenix* - **U of S researcher says flexibility is key to effective pandemic response for sports industry**

- Feb. 23 – *Cystic Fibrosis News Today* – **Canadian Researchers to Study New Cell Types in CF**
- Feb. 24 – *Western Producer* - **Barley research spending well worth the investment**
- Feb. 28 – *Saskatoon StarPhoenix* - **U of S researcher dives into deep learning to find global solutions**
- Feb. 28 – *Massachussetts Institute of Technology News* – **Study reveals chemical link between wildfire smoke and ozone depletion**
- Mar. 1 – *Canadian Biomass Magazine* - **USask researcher, Tidewater Renewables to develop novel process to produce RNG from biomass**
- Mar. 1 – *Canadian Cattlemen* – **Eye drop vaccine for pink eye in cattle under development**
- Mar. 1 – *New York Times* – **The coronavirus may be evolving in deer, two studies suggest**
- Mar. 3 – *Saskatoon StarPhoenix* - **Dr. Ivar Mendez: Neurosurgeon, sculptor and champion for remote care**
- Mar. 6 – *OutdoorLife* - **A New Telemetry Study Could Solve the Mysterious Decline of Atlantic Flyway Mallards**
- Mar. 7 – *CBC News* - **Office for First Nations health complaints key to bettering Sask. system: researchers**
- Mar. 8 – *National Post* - **Among the stars: Meet the Canadian women making an impact in astronomy and physics**
- Mar. 9 - CNN - **Affection from a dog really is medicinal, according to a new study**

UNIVERSITY OF SASKATCHEWAN

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

Looking for past issues of Discovery Digest or Research Update? Visit **Research.usask.ca** for more.

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.**