



April 2022 - Issue 51

*In this issue:* how USask researchers contributed to the NASA BioSentinel experiment, COVID-19 is detected in Sask. white-tailed deer, a research team works to develop a long-term remote health care strategy, the 2022 USask Images of Research are

announced, 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!](#)

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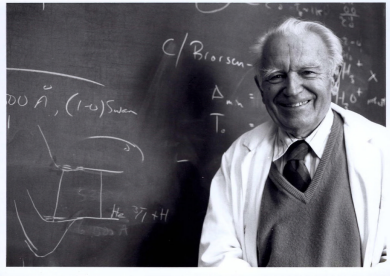
## This Month's Stories



### [USask research plays role in developing space radiation experiments for NASA Artemis I mission](#)

The NASA BioSentinel mission will fly as part of Artemis I, and is the sole biological experiment selected to head for the cosmos. It will collect important data about how long-term exposure to space radiation may affect life forms by using yeast experiments. Because yeast is a living organism that shares many essential cellular processes with humans, it may be able to serve as an example of how deep space radiation may affect humans themselves. Dr. **Troy Harkness** (PhD), a professor at the

USask College of Medicine, served as a consultant on some of the early studies that led to the experiment's inclusion on the BioSentinel. [The full story.](#)



### [USask to host Defining Moments Canada exhibit on Gerhard Herzberg in celebration of basic research](#)

As part of a national initiative to mark the 50th anniversary of **Gerhard Herzberg's** Nobel Prize in Chemistry, USask has partnered with heritage education organization Defining Moments Canada to present the travelling exhibition Enterprises of the Human Spirit: 50 Years of Scientific Excellence in Germany and Canada.

Sponsored by the Embassy of the Federal Republic of Germany, the exhibit will tour across Canada over the next year. The first stop will be USask where Herzberg and his wife and scientific partner Luise spent 10 years after they were brought from Nazi Germany in 1935 through the efforts of USask's first president Walter Murray. The exhibit will be on display in the USask Place Riel North Concourse from April 11th to May 5th, with free admission. [The full story.](#)



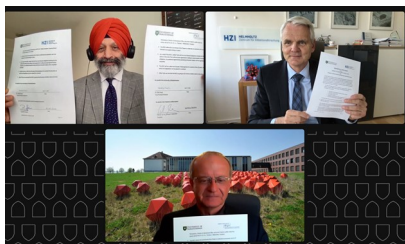
### [USask-led study aims to provide guide to 'build back better' after pandemic](#)

A large interdisciplinary team led by USask researchers Dr. **Nazeem Muhajarine** (PhD) and Dr. **Erika Dyck** (PhD), which is collaborating with community service agencies in Saskatoon and Regina, has been awarded \$390,000 by a federal agency to study the wider social and health impacts of COVID-19 in Saskatchewan.

Funded by the Canadian Institutes for Health Research, the project aims to apply a social justice lens to examine the pandemic's impact on the mental health, substance use (especially opioids), food insecurity, and precarious housing situations and evictions among "equity-seeking groups" such as Indigenous citizens, new immigrants, and minorities. [The full story.](#)

### **MOU to advance USask infectious disease research**

The University of Saskatchewan has signed a memorandum of understanding (MOU) with Helmholtz Centre for Infection Research and the Friedrich-Loeffler-Institut, two leading research centres located in Germany, to support research partnerships in the area of One



Health, including vaccine and infectious disease research.

The MOU will support all three institutions to bring joint research opportunities to students, staff and faculty, develop new student training curriculums as well as explore innovation and commercialization opportunities for research findings.



### USask-led multi-disciplinary team helping to develop strategy for virtual care

Internationally renowned virtual care pioneer Dr. **Ivar Mendez** (MD, PhD) of the University of Saskatchewan and the Saskatchewan Health Authority is leading a large group of experts to help the province develop a long-term strategy for delivering health services remotely.

Team members will provide expertise in pediatrics and working with Indigenous populations and bring in-depth knowledge of health informatics and computer science. They have experience in delivering services related to mental health and addictions, dementia, and infectious disease, and knowledge of health law, policy, and more. Rounding out the team are people who have experienced barriers to health care access and have received virtual care. [The full story.](#)



### **USask researchers receive funding to pursue innovation in agriculture and health**

USask research teams led by researchers from the College of Arts and Science and the College of Agriculture were awarded \$250,000 each through the Canada New Frontiers in Research Fund to pursue innovation in the agriculture and health sectors.

Launched in 2018, the New Frontiers in Research Fund funds high risk-high reward, interdisciplinary, and transformative research led by Canadian researchers

working with Canadian and international partners.

Dr. **Graham George's** (PhD) team will analyze how X-ray florescence imaging can play a role in determining the role of metals in the progression of nerve damage in people with multiple sclerosis. Dr. **Leon Kochian** (PhD) will lead a team in using sophisticated computer science to design root systems in crops that will better tolerate the effects of

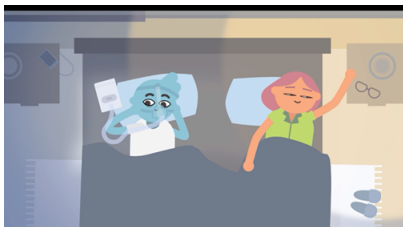
climate change. Dr. **Timothy Sharbel** (PhD) and team will study how a type of asexual seed production may allow for more efficient and abundant crop breeding techniques.



### [USask teams awarded \\$600,000 to find innovative solutions to addictions](#)

The funding by the Saskatchewan Health Research Foundation will enable seven USask research teams to engage knowledge-users and people with lived/living experience as team members to address addictions as a growing health concern and ensure the work leads to practical applications to effect change.

The projects address a range of addictions-related issues, from smoking cessation, substance use, addiction in youth, and addressing the reliance and risk of misuse of opioids for those living with chronic pain. Other projects are looking at vulnerable populations, such as new immigrants and Indigenous communities. [The full story.](#)



### [Video series addresses knowledge gaps about sleep apnea in Saskatchewan](#)

The Respiratory Research Centre, in partnership with the Saskatchewan Centre for Patient Oriented Research (SCPOR), collaborated with the James Lind Alliance in a Priority Setting Partnership which resulted in a list of the Top 10 research priorities for obstructive sleep apnea in Saskatchewan. Over 1100 Saskatchewan residents and clinicians nationwide provided their most pressing concerns/questions related to OSA. From this collaboration, the RRC also identified information gaps for many OSA patients and families. As a result, the RRC and researcher Dr. **Donna Goodridge** (RN, PhD) developed brief videos for the public to ensure those with OSA are equipped with the knowledge to identify and treat the condition effectively. [Watch the video series.](#)

### [Smile: Community-led research supports better oral health in Indigenous community](#)

The Village of La Loche was involved in research funded by the Saskatchewan Health Research Foundation, and led by Dr. **Marcella Ogenchuk** (PhD), that was designed to look at the oral health needs of Indigenous communities while engaging the community in the research. The interdisciplinary, community-led research doesn't focus on how to fix these challenges. Instead, the team looked at the strengths of the community and how these could be used to support better oral health. One result of the research is a book titled



Smile, designed to share with community members how best to care for their teeth. [The full story.](#)



### [Creating culture-based tools for Indigenous youth to self-manage Type 2 Diabetes](#)

USask College of Nursing researchers Drs. **Shelley Spurr** (PhD) and **Jill Bally** (PhD) are co-leading a project with researchers and community members to create Indigenous community-led and culture-based Type 2

Diabetes education and self-management tools for youth. The youth will use the tools to maintain and protect their health and wellness in ways that link to their culture, language, and ancestral teachings. Dr. **Sarah Oosman** (PhD) from the School of Rehabilitation Science and Dr. **Amanda Froehlich Chow** (PhD) from the School of Public of Health are co-researchers on the study. [Watch the full video.](#)



### [USask teams funded to breathe new life into lung health research](#)

Three transdisciplinary research teams have been awarded almost \$350,000 from Saskatchewan Health Research Foundation and Lung Saskatchewan to discover

solutions to lung health challenges. Teams will look at lung health issues such as how co-infection with Mycobacterium tuberculosis and SARS-CoV-2 impacts lung health; the long-term effects of COVID-19 infections on the respiratory system, specifically shortness of breath; and a virtual behaviour change program for women with Obstructive Sleep Apnea. [The full story.](#)

### [Re-envisioning child welfare](#)

Johnson Shoyama Graduate School of Public Policy student **Jillian Senécal** is undertaking research focused on the correlation between lack of Indigenous culture and involvement in the child welfare system and the number of Indigenous children and families in care.





[story.](#)

At the heart of the research is the concept of Opikināwāsowin, raising our children well (Cree, Swampy, N dialect). In Indigenous culture, extended family plays a major role in child rearing, and Opikināwāsowin values were broken during the residential school era. The work is analyzing how connection to one's own culture can mitigate the risk of being involved in the child welfare system. [The full](#)



#### [Assault weapons ban, climate change action divisive: Prairie residents](#)

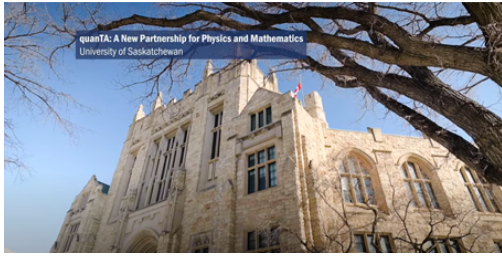
Findings from the latest Taking the Pulse of Canada national quarterly survey – conducted by the USask Canadian Hub for Applied and Social Research – shows that Prairie residents are in lockstep with fellow Canadians in saying COVID-19 and the 2021 federal election were the two biggest issues that divided the country over the past year. The latest survey shows 75 per cent of respondents nationally, and 83 per cent in the Prairies, saying the country has become more polarized over the past year. But Prairie residents are far more likely than other Canadians to believe that fighting climate change divides the country, and also more apt than Ontarians and Quebecers to say that the ban on assault weapons is an issue causing disunity. [The full story.](#)



#### [Building a new 'normal' for family planning in 2SLGBTQ+ communities](#)

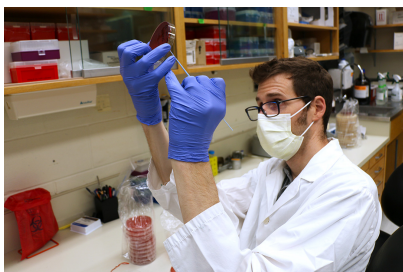
Research by USask College of Nursing graduate **Kerry Marshall** and supervisor Dr. **Wanda Martin** (RN, PhD) brings to light the barriers and challenges the 2SLGBTQ+ community faces and examines how health care providers can support members in their family planning decisions.

The work identified that members of the 2SLGBTQ+ community are likely to encounter both supportive and suppressive factors as they work through family planning decisions. Supportive factors that include their surrounding community create positive impacts on individuals, while suppressive factors such as financial, social and biological constraints can add difficulty to an already challenging process. [The full story.](#)



### [USask quanTA centre featured in new documentary](#)

At the University of Saskatchewan, the Centre for Quantum Topology and its Applications (quanTA) is using pure mathematics to propel its quantum innovations. The American Physical Society featured quanTA as one of the world's most exciting new physical sciences institutes in 2022 in their mini-documentary series presented at their annual meeting. [Watch the video](#) to see how faculty and students at quanTA working to make the Canadian Prairies a hub for quantum science.



### [USask researchers track multi-species transmission in world first](#)

A team of USask researchers have cracked a multi-species mystery, documenting the flow of a common canine pathogen from a dog to a human. This finding is the first documented, symptomatic urinary tract infection (UTI) in a human patient caused by transmission of *Staphylococcus pseudintermedius* bacteria from a dog.

Led by Dr. **Joseph Blondeau** (PhD) of the USask College of Medicine and Dr. **Joe Rubin** (DVM, PhD) of the Western College of Veterinary Medicine along with PhD candidate **Leah Blondeau**, this collaborative effort took samples from both a pet and its owner to find the source of infection. [The full story.](#)



### [Collaborative surveillance team detects SARS-CoV-2 virus in Saskatchewan white-tailed deer](#)

SARS-CoV-2, the coronavirus that causes COVID-19, is transmissible between people and animals. Nearly two years after researchers pooled resources to build a wildlife surveillance program, there's proof that SARS-CoV-2 virus is circulating among free-ranging, white-tailed deer in Saskatchewan.

The research team found positive results in viral RNA swabs taken from four white-tailed deer harvested in 2021. The National Centre for Foreign Animal Disease confirmed the results, which represent two per cent of 227 white-tailed deer tested in Saskatchewan. Ten per cent of 62 white-tailed deer tested also had SARS-CoV-2 antibodies—indicating previous exposure or active infection. [The full story.](#)



### [USask, international researchers find modern animal life could have origins in delta](#)

The ancestors of many animal species alive today may have lived in a delta in what is now China, suggests new research published by an international team including USask researchers and paleontologists Dr. **Luis Buatois** (PhD), Dr. **M. Gabriela Mángano** (PhD) and post-doctoral fellow Dr. **Maximiliano Paz** (PhD).

The 518-million-year-old Chengjiang Biota – in Yunnan, southwest China – is one of the oldest groups of animal fossils currently known to science, and a key record of the Cambrian Explosion. The results of this study are important because they show – for the first time – that most early animals tolerated stressful conditions, such as salinity (salt) fluctuations, and high amounts of sediment deposition. [The full story.](#)



### [Rams' breeding soundness key to sheep flock health](#)

Researchers at the Western College of Veterinary Medicine and Agriculture and Agri-Food Canada are working to update the ram breeding soundness evaluation guidelines so they represent specific sheep breeds raised in Western Canada.

This unique study aims to help producers by providing guidelines for four different breeds raised in Canada's Prairie provinces. Despite growth in Canada's sheep industry, researchers haven't thoroughly studied reproduction in these particular species. This study aims to provide more information to producers, allowing them to improve reproductive success of their flocks. [The full story.](#)



### [USask researchers aim to boost uranium, wheat sectors with novel technology](#)

Two USask projects have been awarded Natural Sciences and Engineering Council Alliance Grants totaling \$885,000 for research aimed at developing novel technologies to improve productivity and profitability in the key agriculture and uranium sectors.

Dr. **Yuanming Pan** (PhD), professor in geological sciences at USask's College of Arts and Science, was awarded \$60,000 over two years to further develop and refine a novel



technique he invented for uranium exploration involving studying radiation-induced defects in quartz and calcite. A large multidisciplinary team led by USask College of Agriculture and Bioresources professor Dr. **Randy Kutcher** (PhD) and Crop Development Centre research associate Dr. **Lipu Wang** (PhD) will develop wheat plants with stronger genetic resistance to Fusarium head blight, a fungal disease that shrivels kernels in the grain, causing severe losses in yield and quality. [The full story.](#)



[\*\*Global Institute for Food Security at USask receives provincial funding to measure and promote sustainable agriculture practices\*\*](#)

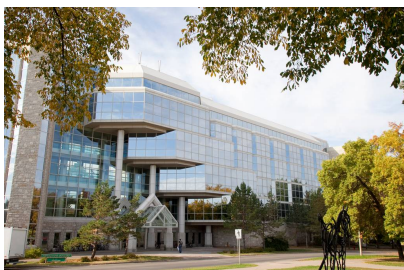
The Government of Saskatchewan has announced \$2 million in new funding to the Global Institute for Food Security (GIFS) as part of its 2022-23 budget released on March 23. The funding, provided through the Ministry of Agriculture, has been entrusted to GIFS to define, accelerate, and communicate the agriculture sector's contributions to improved environmental outcomes. [The full story.](#)



[\*\*Peeling onions to help crops withstand drought and disease\*\*](#)

USask College of Agriculture and Bioresources Master's student **Ariana Forand** and professor Dr. **Karen Tanino** (PhD) are using synchrotron light to literally peel back the onion on cell walls to help plants better withstand the stresses caused by climate change and disease.

Forand led a project that explored how calcium and boron play a beneficial role in strengthening plant cell walls, helping reduce the dehydration that comes with freezing and drought and increasing resistance to pathogens. The team analyzed onion samples and collected data at the Advanced Photon Source in Illinois, thanks to the facility's partnership with the Canadian Light Source at USask. [The full story.](#)

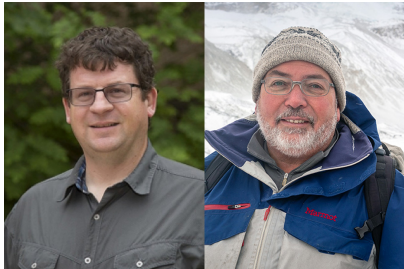


[\*\*New food economics textbook edited by AgBio researcher\*\*](#)

Dr. **Jill Hobbs** (PhD) of the College of Agriculture and Bioresources is one of two editors of the new textbook, *A Modern Guide to Food Economics*.

This Modern Guide provides detailed theoretical and empirical insights into key areas of research in food economics. It takes a forward-looking perspective on how different actors in the food system shape the sustainability of food production, distribution, and consumption, as well as on major challenges to efficient and inclusive food systems.

[More information.](#)

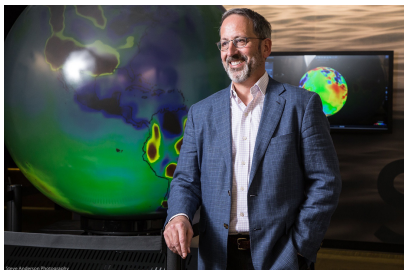


### [USask experts collaborate on international projects to transform water predictions](#)

A team of hydrologists from USask including Dr. **Martyn Clark** (PhD) and Dr. **John Pomeroy** (PhD) and University of Calgary comprises the Canadian contingent in an unprecedented international collaboration that aims to revolutionize flood predictions across North America.

The international collaboration, called the Cooperative Institute for Research to Operations in Hydrology, will be headquartered in the Alabama Water Institute at the University of Alabama. The modelling will provide predictions of droughts, floods and water quality conditions and also will enable administrative bodies to optimize water supply and irrigation, hydro power operations, reservoir management, and recreation.

[The full story.](#)



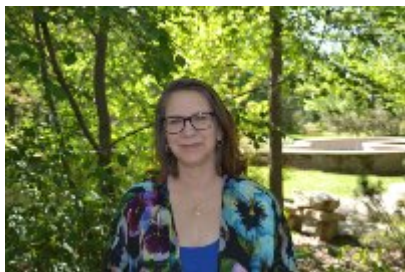
### [USask report identifies sectors putting global freshwater resources at risk](#)

A new report led by USask researchers and Global Institute for Water Security executive director Dr. **Jay Famiglietti** (PhD) reveals how industry practices are driving critical threats to global freshwater systems, including groundwater depletion, metal contamination, plastic pollution, and water diversion.

[The Global Assessment of Private Sector Impacts on Water](#) makes clear that several key industries like food products, textiles and apparel, and others that are not typically top-of-mind such as pharmaceuticals and mobile technology products, stand out as the biggest contributors to these threats. [The full story.](#)

### [USask professor named Canadian Anthropology Society fellow](#)

Department of Archaeology and Anthropology professor Dr. **Pamela Downe** (PhD) has been named a fellow of the Canadian Anthropology Society (CASCA). Fellows are



longstanding members of CASCA who have made notable contributions to anthropology in Canada through research, practice, teaching/mentoring or service.



### [USask student assists adolescents in exploring COVID-19 experiences through animation](#)

The experiences of adolescents living in Saskatoon is of particular interest to USask student **Meagan Hong**. As a fourth-year health studies student in USask's College of Arts and Science, Hong recently completed an honours research project that involved guiding six Saskatoon teenagers through five virtual workshops so that they could learn to create animated artwork to express their COVID-19 life experiences. The student participants were guided through interactive animation workshops with the goal of providing them with the tools they needed to share their pandemic stories through animated artwork. Watch video previews of the animation work [here](#). [The full story](#).



### [Event showcases Education student research](#)

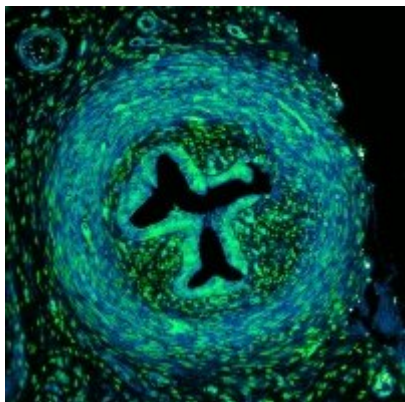
On Saturday, April 2, the College of Education hosted its annual Celebration of Research, Scholarly and Artistic Work event for students. The virtual event showcased the rich and diverse work of graduate and undergraduate students in the college and included presentations exploring the use of immersive virtual reality for high school drama students, critical media literacy in elementary curriculum, and the perception of online education in a pandemic. See all research presentations and awards [here](#).

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## From the Office of the Vice-President Research

### [Announcing the 2022 USask Images of Research](#)

The results are in! Organized by Research Profile and Impact, the eighth annual Images of Research competition has officially closed. USask researchers from across campus showed us what research looked like to them – what they have seen, created and



discovered while they continued to conduct research the world needs – with a total of 92 image entries. Multidisciplinary judging panels convened to select this year’s winners.

This year’s Grand Prize was awarded to undergraduate student **Nicholas Bauer** for the image (displayed) titled “Biohazardous Birth.” To see a full list of winning images, [click here](#).

## Awards and Recognition

[research.usask.ca/awards](https://research.usask.ca/awards)

### Awards and Recognition

Find out if there are any upcoming awards deadlines or let us know about awards in your discipline that should be added to our [external awards list](#). If you are interested in pursuing a potential nomination, please reach out to [research.communications@usask.ca](mailto:research.communications@usask.ca) to discuss what support is available.

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## In THE CONVERSATION

USask is a founding partner of national academic newswire, [The Conversation Canada](#), which provides independent, high-quality journalism. Get in touch with [Research Profile and Impact](#) if you are interested in submitting a story or opinion piece.

### Hemodialysis: New research could vastly improve this life-sustaining treatment for kidney failure patients

USask assistant professor of chemical and biological engineering, Dr. **Amira Abdelrasoul** (PhD)

Hemodialysis is a life-sustaining treatment for kidney failure patients to clean and filter their blood of waste products, salts and excess fluid. However, this membrane-based therapy is not perfect. As a membrane science researcher, I am working on creating hemodialysis membranes that are more compatible with the human body than current membranes.

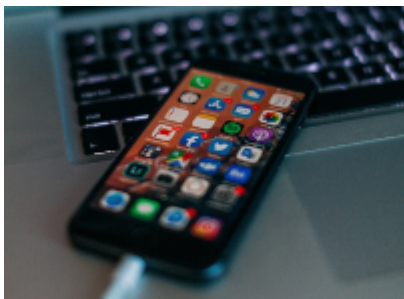


## Telling your research story

[[www.linkedin.com/company/usask-research-profile-impact](https://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 [LinkedIn](#)

[page](#) (formerly the Research Profile and Impact page) to stay in the know, with exciting research news delivered right to your newsfeed.

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## 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:

Apr. 27 - [Opinion Writing with SK Opinion Editors for Researchers](#) - 1 PM CST - with Russell Wangersky, Editor

of the StarPhoenix/Leader-Post and Abby Schneider, producer for Opinion/Engagement at CBC Saskatchewan

May 5 - [2022 Life and Health Sciences Research Expo](#)

May 5 - [CIHR Town Hall with Dr. Michael Strong, President of CIHR](#) - 11:30 AM CST

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## In the news

- The month's top stories:
  - [Assault weapons ban, climate change action divisive: Prairie residents](#) was featured by 180 media outlets including the *Toronto Star* and *The Canadian Press* and was seen by an estimated 76 million people.
  - [Collaborative surveillance team detects SARS-CoV-2 virus in Saskatchewan white-tailed deer](#) was featured by 50 media outlets and was seen by an estimated 6.8 million people.
  - [USask, international researchers find modern animal life could have origins in delta](#) was featured in 26 media outlets including *Science Daily* and *The Science Times*, and was seen by an estimated 6.7 million people.
- Other USask research has also been featured in:

- Mar. 15 – *Smithsonian Magazine* – [Therapy Dogs Help Reduce Pain in Emergency Room Patients](#)
- Mar. 17 – *CBC News* - [NASA's 'mega moon rocket' is heading to the launch pad. Here's what you need to know](#)
- Mar. 17 - *Western Producer* - [Research project puts plants under surveillance](#)
- Mar. 19 - *CBC Quirks and Quarks* - [with a segment with USask toxicologist Dr. Markus Brinkmann \(PhD\) on tire rubber pollution](#)
- Mar. 21 - *Global News* - [USask research on protecting crops from heat and frost damage](#)
- Mar. 21 - *Scientific American* - [The Evolving Quest for a Grand Unified Theory of Mathematics](#)
- Mar. 23 - *Buzzfeed News* - [Even Carole Baskin's Tigers Had COVID. Here's How It's Affecting Animals In Zoos And Sanctuaries Across The US.](#)
- Mar. 27 - *The Globe and Mail* - [Feeding the world, sustainably](#)
- Mar. 28 – *Researchers Under the Scope* podcast: USask College of Medicine - [Physician in the field: Niels Koehncke on the 'flip side' of medicine](#)
- Mar. 29 - *CBC Blue Sky* - [Saskatchewan's plan to use small modular reactors](#)
- Mar. 30 - *Global News* - [How plastic pollution is choking the planet, and what's being done about it](#)
- Apr. 4 - *CU Boulder Today* - ['Patient influencers' are booming on social media. Is that good or bad?](#)
- Apr. 6 - *Regina Leader-Post* - [Opinion: Time running out to secure Saskatchewan's water prosperity](#)
- Apr. 7 - *CBC News* - [After seeing how gas stoves pollute homes, these researchers are ditching theirs](#)
- Apr. 10 - *Saskatoon StarPhoenix* - [Young Innovators: U of S researcher helps protect the atmosphere by interpreting satellite data](#)



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