In this issue: USask researchers uncover dangers of LCD screen chemicals, distant past of Canada's Far North involved lush forests, picky penguins, worms of yesteryear can teach us where to find their descendants, and so 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!

**Household dust hosts potentially toxic chemicals from LCD screens: USask-led study**

Chemicals commonly used in smartphone, television, and computer displays were found to be potentially toxic and present in nearly half of dozens of samples of household dust collected by an international team of toxicologists led by USask’s Dr. John Giesy (PhD).

The first-of-its kind study published Dec. 9 in *Proceedings of the National Academy of Sciences* collected and analyzed 362 liquid crystal monomers from 10 different industries, and found 90 percent had troubling characteristics. [Read the story. Watch a video.](#)

**Canadian tundra formerly covered in rich forest: ancient plant fossil record shows**

Canada's northernmost expanses, Ellesmere and Axel Heiberg islands in Nunavut, were home to a vibrant, temperate forest 56 million years ago, according to fossil research just published by USask scientists.

Post-doctoral fellow and recent PhD graduate Dr. Christopher West (PhD), co-supervised by USask geologist Dr. Jim Basinger (PhD), and USask adjunct geology professor Dr. David Greenwood (PhD), examined more than 5,000

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Climate change and human activities threaten picky penguins

Eating a krill-only diet has made one variety of Antarctic penguin especially susceptible to the impacts of climate change, according to new research involving USask researcher Dr. William Patterson (PhD) which sheds light on why some penguins are winners and others losers in their rapidly changing ecosystem. Stable nitrogen isotope values of amino acids from 100 years-worth of penguin feathers were analyzed to determine that Gentoo penguins thrived by adapting their diet to what was available, whereas chinstrap penguins stuck to eating the same tiny crustacean and suffered, consequently.

The research was published Dec. 2 in Proceedings of the National Academy of Sciences by a team that also involved Louisiana State University, University of Rhode Island, University of Oxford, and University of California, Santa Cruz.

Wriggling on the shoulders of tiny giants: Old worm track fossils help predict modern worm behaviour

As reported in a Dec. 5 article published in Scientific Reports, a team of USask researchers used fossil evidence to successfully predict the distribution of an elusive worm in the present day—a rare demonstration that sometimes the past can be the key to the present. Former Department of Geological Sciences graduate student Dr. Luis Quiroz (PhD) and faculty members Dr. Luis Buatois (PhD) and Dr. Gabriela Mángano (PhD) are three co-authors on the article, which can be read online.

USask leads study into PTSD service dogs and veterans' substance abuse recovery

Learning how psychiatric service dogs can help veterans living with post-traumatic stress disorder (PTSD) recover from problematic alcohol and drug use is the focus of a new $1.4-million research program led by USask sociologist Dr. Colleen Dell (PhD) in partnership with five universities and a dozen community organizations and members.

Service dogs are increasingly being recognized as a complement to regular PTSD
treatment. The dogs are trained with technical skills, such as waking a veteran from a night terror, and the human-animal bond is a motivating influence for improved health, such as going for regular outdoor walks. Read the full story.

Major Accolades

Four USask researchers named Distinguished Professors

A select group of senior researchers who are nationally and internationally recognized, and who have enhanced their field of knowledge significantly, have been named Distinguished Professors. A maximum of 30 current faculty can hold Distinguished Professorships at any one time. As of Jan. 2020, the following professors will be granted the title:

- Dr. Ajay Dalai (PhD), Canada Research Chair in Bioenergy and Environmentally Friendly Chemical Processing, Department of Chemical and Biological Engineering
- Dr. Ken Coates (PhD), Canada Research Chair in Regional Innovation, Johnson Shoyama Graduate School of Public Policy
- Dr. Maureen Reed (PhD), School of Environment and Sustainability
- Dr. Soledade Pedras (PhD, D.Sc.), Canada Research Chair in Bioorganic and Agricultural Chemistry, Department of Chemistry

Water

The world is 'losing its cool' with the loss of snowpacks and glaciers

At the UN Climate Change Conference in Madrid, Spain (COP25), USask scientists focussed attention on the world’s changing mountain snowpacks, glaciers, and long-term effects that the thaw of snow and ice are having on the world’s freshwater and ocean water. Dr. John Pomeroy (PhD) said changes to the cryosphere (the frozen water part of the Earth system) have led to unsustainability of freshwater, even where it is abundant. Read the story.

Also at COP25, a new report by USask Sustainability Education Research Institute (SERI) director Dr. Marcia McKenzie (PhD) was released. The report analyzed education, training, and public awareness content in 368 country submissions to the UN. While almost all countries included some reference to climate change education, they tended to
focus on “public awareness,” rather than formal education, and are slow to include climate change education in their commitments under the Paris agreement to combat climate change. Read the report.

Canada falling short of UN’s Sustainable Development Goals: New report from water scientists

Canada could lead the world in helping to achieve water sustainability but is falling short of reaching the goals set out by the United Nations (UN), according to a new report from scientists with the USask-led Global Water Futures (GWF) program.

GWF director Dr. John Pomeroy (PhD), Canada Research Chair in Water Resources and Climate Change, called for a transformation of how Canada observes, predicts and manages water, as well as sharing solutions with the world, in order to become a global leader in meeting sustainable development goals. Read the story. Read the full report.

USask water expert joins global call for action to protect global groundwater sources

Dr. Jay Famiglietti (PhD), executive director of the USask Global Institute for Water Security and Canada 150 Research Chair in Hydrology and Remote Sensing, has joined an international group of scientists calling for action to defend global groundwater supplies. Read the story. Read the statement.

USask Cold Region doc becomes official curriculum in Sask. schools

A USask-produced short documentary, The Changing Climate and Environment of Western Canada, has been approved by the Sask. Ministry of Education to support the “Science 10” and “Environmental Science 20” curricula. The documentary highlights major scientific outcomes from the USask-led Changing Cold Regions Network and focuses on how Western Canada’s rapidly changing cold interior has changed and will continue to change until the end of the 21st century. Watch the documentary on YouTube now.
Advancing global food security to feed a growing world

The world needs innovative ways to tackle the challenge of feeding a growing population. The Global Institute for Food Security (GIFS) at USask is part of an ecosystem that involves agricultural producers, industry, distributors, and institutions, providing innovative solutions for an accessible, safe, nutritious, and reliable food system.

What sort of solutions? Read the details.

Protein Highway forges connections

Bioengineering professor Dr. Venkatesh Meda (PhD) and plant protein researcher Dr. Bob Tyler (PhD) have been featured in The Western Producer for their involvement in the Protein Highway project. The key goal of the project is to accelerate commercial development of plant proteins by gathering together leaders from government, industry and research from the U.S. Great Plains and Canadian Prairies.

Health

USask surgery department releases six new research videos

The USask department of surgery has released a series of videos that highlight some of the research, education, practice, and innovation at USask. The short vignettes feature Dr. Ivar Mendez (PhD, MD), Dr. Francisco Cayabyab (PhD), Dr. David Kopriva (MD), Dr. Jonathan Norton (PhD), Dr. Paul Mick (MD), and Dr. Yigang Luo (PhD, MD). The videos premiered as part of USask Surgery Faculty Research Day on Nov. 14, and will be used to promote USask surgery research to partners and funders, and at events. Watch the departmental video.

Telling your Research Story

Get snapping for NSERC Science Exposed! and USask Images of Research

NSERC’s travelling Science Exposed! 2018 Exhibit has just finished at USask, and submissions are now open for the 2020 competition. The research image contest
challenges Canadians to combine creativity and science for a chance to win cash prizes of $2,000. Submit the best photo and description of your NSERC-funded research by Jan. 13 to enter.

And, don’t forget – USask’s Images of Research competition, organized by Research Profile and Impact, is upcoming in February. Snap your research, scholarly, and artistic work and enter your images for the chance to win glory and cash prizes.

Canada Foundation for Innovation (CFI) social media contest – Deadline Jan. 31

Calling all undergraduates, master’s students, PhDs and postdoctoral fellows in CFI-funded labs! The CFI has launched its third #IAmInnovation Twitter contest. How does working in state-of-the-art facilities and with cutting-edge equipment allow you to make a difference? Tweet an image or video of how you work with CFI-funded equipment or in a CFI-funded research space. Remember to follow and tag @InnovationCA, and include the hashtags #IAmInnovation and #Contest in your Twitter submission. Winners will have a chance to win a trip to Ottawa and take part in a research communications workshop. Details here.

Young Innovators

U of S team sheds light on new Alzheimer’s drugs

A USask research team involving chemistry PhD student Kelly Summers, supervised by Canada Research Chair in X-Ray Absorption Spectroscopy Dr. Graham George (D.Phil), Canada Research Chair in Molecular Environmental Science Dr. Ingrid Pickering (PhD), and Dr. Stephen Urquhart (PhD), has shed light on the functioning of potential new Alzheimer’s disease drugs that target copper plaques in the diseased brain, a finding that could help improve the drugs to benefit patients’ learning skills and memory. Read the full story.

Engineering better egg-free ingredients for vegans
PhD student Yue He has developed a better egg replacement for making foods such as mayonnaise. The ingredient called aquafaba—chickpea water—will provide more food options for people with allergies and for those who love a vegan lifestyle or need to keep their cholesterol in check. Yue He works under the supervision of plant sciences professor Dr. Martin Reaney (PhD), biological engineering professor Dr. Venkatesh Meda (PhD) and food scientist Dr. Rana Mustafa (PhD). Read more.

USask med app helps read medicine labels

Undergraduate student Alexander Magnus and computer science professor Dr. Debajyoti Mondal (PhD), his supervisor, have developed a smartphone app that will help visualize and “translate” difficult information on over-the-counter drug labels in way that is accessible to everyone. Read more.

Featured in THE CONVERSATION

‘The Prime Effect’ means retailers must innovate during the holidays and beyond

Edwards School of Business researcher Dr. Grant Alexander Wilson (PhD)

Innovation is integral to the success of Canadian retailers and encouraging consumers to shop in stores as well as online. The big strategic risk is not innovating and failing, but failing to innovate.

Chrystia Freeland will have to navigate misogyny in her new roles

Ryerson University’s Dr. Tracey Raney (PhD) and USask political scientist Dr. Loleen Berdahl (PhD)

If successful, Chrystia Freeland could help bolster national unity and Canada’s relationships with the U.S. and Mexico. But relentless sexist attacks against her could derail progress.

Bring back Beardy’s Blackhawks: Indigenous hockey team eliminated from Sask. league
Queen's University's Dr. Sam McKegney (PhD), McGill University's Dr. Jordan Koch (PhD) and USask Indigenous studies professor Dr. Robert Henry (PhD)

The Saskatchewan Hockey Association (SHA) recently eliminated the Beardy's Blackhawks Midget AAA team — but needs to reconsider the team's crucial community role in an era of reconciliation.

*Your electronic health data: Understanding the different records, systems and how they connect*

Dr. Tracie Risling (PhD), USask College of Nursing

Know the difference between an EMR, EHR and PHR? Our digital data expert sets the record straight.

*Write about your own research in The Conversation*

Articles written by USask researchers have been read more than 1.5 million times since the university entered into a partnership with the SSHRC-funded Conversation Canada in June 2017. USask is a founding member of The Conversation Canada, an online academic journalism hub/newswire where researchers write plain-language editorials and explainers articles about their research.

Want to reach a broad audience with your research? Consider submitting 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 Kathryn Warden.*

*International*

**Advancing collaborations with India**

USask President Peter Stoicheff recently signed MOUs with the presidents of three universities in India to explore collaborative academic, research and scholarly opportunities such as joint research projects, workshops/conferences, and exchanges and internships for students, faculty and staff:

*Banasthali Vidyapith,* the world’s largest fully residential women’s university and one of five Indian higher education institutions exclusively focused to empower
women through education

- **University of Hyderabad**, one of India’s top 10 “Institutes of Eminence” and rated one of the world’s fastest-growing universities by the QS Rankings
- **Malaviya National Institute of Technology (MNIT)**. USask has had a decade-long relationship with MNIT. Last summer, four outstanding MNIT engineering students participated in USask’s Summer Undergraduate Research Initiative organized by USask math professor Raj Srinivasan.
- Five new scholarships were announced to attract additional MNIT engineering students to attend a similar program at the USask College of Engineering. MNIT Director Udaykumar Yaragatti is pictured below with President Stoicheff.

President Stoicheff also gave a keynote address on innovation at the 15th Federation of Indian Chambers of Commerce and Industry (FICCI) Higher Education Summit in Delhi to 300 academic, government and industry leaders. He also met with the Canadian High Commissioner to India **Nadir Patel** and the Principal Science Advisor to the Government of India **Krishnaswamy VijayRaghavan**

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**People Around the World (PAW 2020) conference**

**– Registration and call for poster abstracts**

The third annual People Around the World (PAW) Conference, hosted by USask International Office and planned for Feb. 6 to 7, is now accepting registrations and is calling for abstracts for a poster competition.

The conference features presentations and discussions centered on the United Nations’ 17 Sustainable Development Goals (SDGs), a blueprint to achieve a better and more sustainable future for all. It will feature a keynote address by **Nikhil Seth**, UN Assistant Secretary-General and Executive Director of the UN Institute for Training and Research (UNITAR). [Find out more about the conference](#) and [register](#).

Does your research address one of the 17 UN Sustainable Development Goals? A panel of judges will award cash prizes of $300, $200, and $100 to the top posters. [Submit your abstract](#) – deadline is Jan. 24 at 4:30 p.m.

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**Entrepreneurship**

**USask start-ups win Co.Launch finale**

Two USask-affiliated start-up companies are the winners of tech accelerator program Co.Launch’s most recent competition on Dec. 5.
Planly, a smartphone-based automated financial planning solution created by USask alumnus Justin Halldorson and undergraduates Brock Andony and Rutvik Sanghavi was awarded $10,000. Cropper, a phenotyping software that provides timely image analysis to accelerate agricultural research created by USask Plant Phenotyping and Imaging Research Centre staff member William van der Kamp and graduate student Steven Xue won $10,000.

Co.Launch is one of the tech incubator Co.Labs’s programs, and is sponsored by USask Innovation Enterprise as a way for USask to support the tech startup sector in Saskatchewan.

Humanities and Arts

USask graduate students examine Indigenous, non-Indigenous relations in new documentary play

USask graduate students Yvette Nolan and Joel Bernbaum have created a new documentary play following the tragic death of Colten Boushie in 2016. Bernbaum interviewed more than 200 Saskatchewan residents for Reasonable Doubt, a “verbatim play” comprised entirely of word-for-word quotes, which will have its world premiere Jan. 29 at Persephone Theatre.

Bernbaum is a doctoral student in Geography and Planning and Nolan is a master’s student at the Johnson-Shoyama Graduate School of Public Policy. Nolan has taught in the wîcêhtowin Theatre Program, and both Nolan and Bernbaum have taught in the drama department. Read the full story.


Undergraduate research

Undergraduate Research Project Symposium – Submission Deadline Dec. 31

From research posters and presentations to sculptures and musical numbers, regardless of format,
undergraduates are invited to submit their research projects to the Undergraduate Research Project Symposium. The submission deadline is Dec. 31.

Thursday, Jan. 30, 2020, in the North Concourse of Place Riel, the annual event will highlight the research, scholarly and artistic works of USask undergraduate students, and award thousands of dollars in prizes to the top projects!

The Domino Effect

Third year undergraduate student in the USask College of Medicine Prapti Patel spent the summer working with Dr. Darrell Mousseau of the Department of Psychiatry, the Saskatchewan Research Chair in Alzheimer's Disease and Related Dementias. Prapti's work as an Undergraduate Student Research Assistant (USRA) assisted a larger research project investigating the specific behavior of certain kinds of cells. Read the full story.

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