

# Future Now 2022

**Saskatchewan  
Student Showcase**

May 3, 2022



**Future  
Now**





# Welcome to Future Now



On behalf of the Government of Saskatchewan and the Ministry of Advanced Education, welcome to Future Now 2022.

Congratulations on your research projects, and for taking advantage of the opportunity to demonstrate your accomplishments.

We are proud to work with Saskatchewan post-secondary institutions to provide education, research and skills training opportunities to our students to help you participate in our growing knowledge economy.

The Government of Saskatchewan is committed to ensuring our post-secondary students have the right tools and resources needed to excel in their studies and their careers.

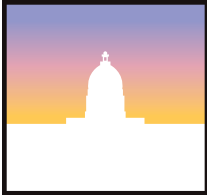
Through programs like student loans, grants, bursaries and scholarships, we are working to empower more students to participate in and complete post-secondary education. I want to take this opportunity to highlight three programs:

- *Mitacs Internship Programs* provide undergraduate students, graduate students and post-doctoral fellows with valuable research internship experience in the local economy.
- *The Saskatchewan Innovation Opportunities Scholarship Program* focuses on innovation and excellence and is distributed by your post-secondary institutions.
- *The Graduate Retention Program* offers \$20,000 in tax credits to graduates who stay and work in Saskatchewan.

I wish you success in your research projects and encourage you to build your future in Saskatchewan.

**The Honourable Gene Makowsky**  
*Minister of Advanced Education*

# Welcome from the Steering Committee



## Future Now

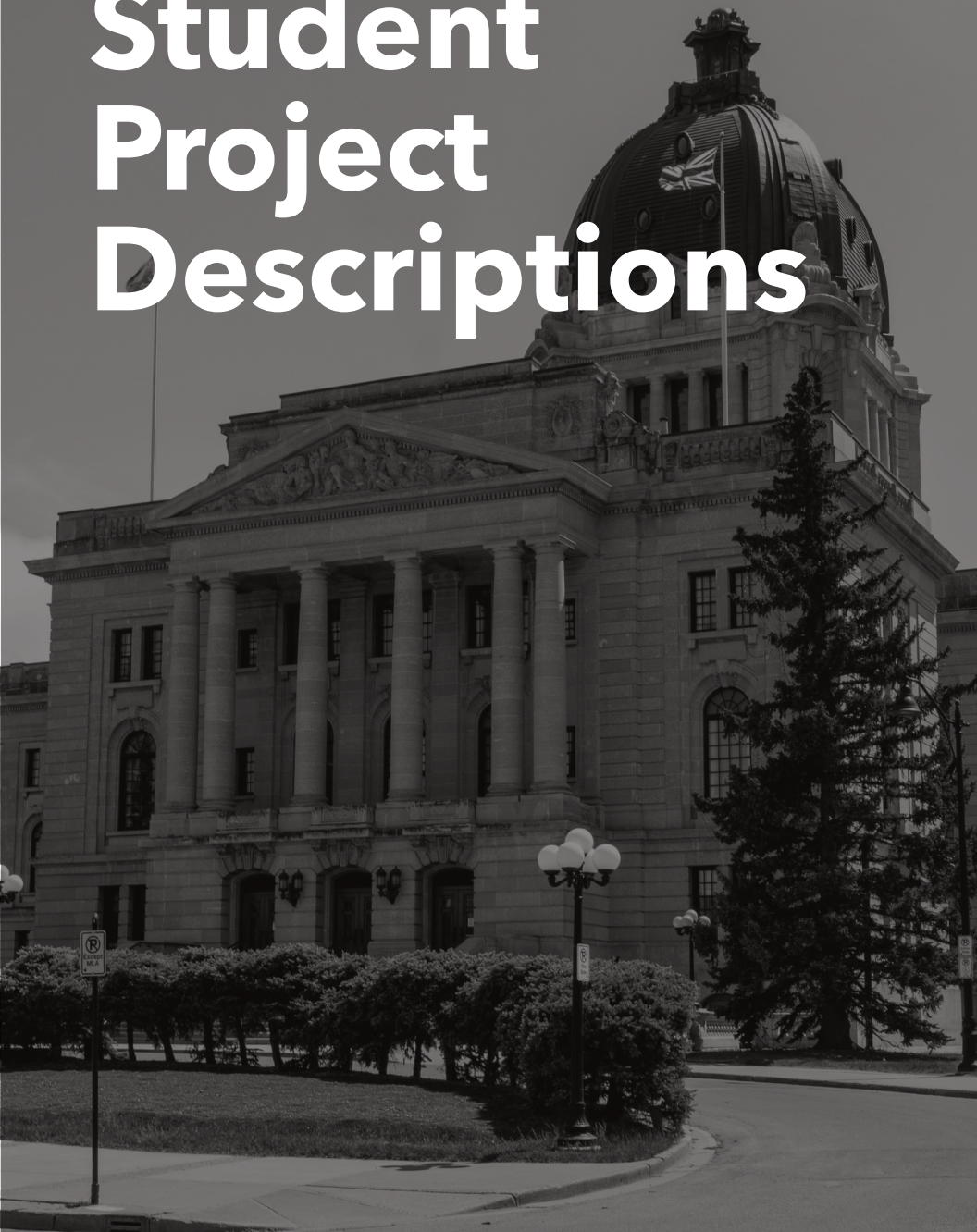
FutureNow grew from an idea: what if Saskatchewan's future leaders of tomorrow could meet with the leaders of today? What would it look like and where should we hold it? The answers were clear: draw students from Saskatchewan's postsecondary institutions and connect those students with members of the legislative assembly, right at the Legislature. We call it FutureNow and we hope it becomes one of the province's signature events.

FutureNow aims to showcase the breadth and depth of student learning in the province, from research through scholarly thought, artistic and applied projects and from across all its institutions of higher education. Our Saskatchewan communities are rich with strength and legacy; FutureNow is a glimpse of the promise and possibilities of the world to come.

On behalf of the entire 2022 FutureNow steering committee:

- Laura Zink, *University of Saskatchewan*
- Sara Daniels, *University of Saskatchewan*
- Alexandra Foster, *University of Saskatchewan*
- Sydney Boulton, *University of Saskatchewan*
- Merle Massie, *University of Saskatchewan*
- Mel Hart, *University of Regina*
- Tobias Sperling, *University of Regina*
- Bettina Schneider, *First Nations University of Canada*
- Kevin Rogers, *Saskatchewan Polytechnic*
- Paula Lindain, *Saskatchewan Polytechnic*

# Student Project Descriptions



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# Dustin Archdekin

## Statics Laboratory System

University of Saskatchewan  
Engineering

Landis, SK

### Abstract

This project created and built a new laboratory system for the GE-123 Engineering Mechanics 2 course, part of the Re-Engineered first year program in the College of Engineering at USask. Parts of the design criteria made it unique to anything that is available on the market today. It is able to demonstrate many examples from the textbook used for the course. I was able to complete the project from initial concept to manufacturing 15 kits. We wanted the kit to illustrate forces, moments, couples, and centers of gravity through sensation to improve the student's comprehension of the physical representation of these concepts. The system had to add value for students by aiding in their learning experience of statics theory.

### Bio

I was raised on a grain farm in rural Saskatchewan. I am a mature student with industry experience in automotive mechanics and machining/manufacturing. My partner and I just had our first child (a boy) in November 2021.

Economy & Industry

Technology

## Hongwei Bi, Jack Gehring, & Jordan MacLeod

### Decreasing CO<sub>2</sub> Emissions by Converting Gas to Methanol

#### Abstract

With efforts to reduce carbon emissions, finding renewable energy production methods that use existing infrastructure will be important. To decrease Saskatchewan's carbon footprint while fully using the province's natural resources, we propose and investigate the use of a small-scale gas-to-liquids (GTL) facility that converts surface gas to methanol. The proposed process considers balance-of-plant components, including C3+ hydrocarbon removal from the initial gas stream as liquids and desulphurization options, and will be optimized to utilize waste heat. The remaining hydrogen-depleted gas that follows methanol synthesis will be optimized for reinjection back to formation without additional carbon capture infrastructure. Each GTL facility could contribute approximately 88 GJ of hydrogen (gas) equivalent energy per year.

Environment

Economy & Industry



## Hongwei Bi

**University of Regina  
Industrial Engineering**

**Dandong, China**

Hongwei has lived in Saskatchewan since 2009. He has worked in the construction industry for over 12 years and particularly enjoys landscaping and design. Hongwei will complete Industrial Systems Engineering in 2022.

## Jack Gehring

**University of Regina  
Industrial Engineering**

**Regina, SK**

Jack was born and raised in Regina, SK where he attends the University of Regina, completing his Industrial Systems Engineering degree. Jack is also a member of the Royal Canadian Air Force and has been since 2016.

## Jordan MacLeod

**University of Regina  
Industrial Engineering**

**Regina, SK**

Jordan has 15 years of construction and maintenance experience, completed Instrumentation at SIAST (Sask Polytech) in 2014 and will complete Industrial Systems Engineering in 2022. He was born in Regina, but has called White Bear home since 2008. He is currently designing and building a new house, from the ground up, by himself.

## Bee Bird

### Mawmaw Sachweezin (Mama's Kitchen)

First Nations University of Canada.  
Indigenous Journalism and Communication

Regina, SK

#### Abstract

Mawmaw Sachweezin is a Métis Cooking Show that is part of píkiskwêwan, an Indigenous language podcast project funded by the Government of Canada. Mawmaw Sachweezin shares the adventures, traditions, and memories of brother and sister, Alex and Beatrice Pelletier, as they cook up traditional Indigenous foods. Included with each episode is a recipe card in Mechif (Michif) and English. The show was initiated by Indigenous Communication and Fine Arts (INCA & IFA) at the First Nations University of Canada (FNUniv) and supports FNUniv's mission to preserve, protect and interpret the history, language, culture, and artistic heritage of all Indigenous groups. The píkiskwêwan project supports training and mentorship for Indigenous storytellers of all ages. The producers are learning their languages by working with fluent speakers and developing technical skills to record and produce stories in Indigenous languages.

#### Bio

Bee Bird is from Montreal Lake Cree Nation and is currently a student at the First Nations University of Canada in Indigenous Communications Arts. Bee is a Podcast Producer/Trainer for the píkiskwêwan project and manages his own company, Bee Productions, and streaming.

## Hannah Burlet

### Action of an Iron-Collecting Bacteriocin Relating to Virulence in *Brachyspira Hampsonii*

University of Saskatchewan  
Animal Bioscience

Calgary, AB

#### Abstract

The prevalence of Swine Dysentery (SD) is increasing in Western Canada and poses many issues for farmers: decreased feed efficiency leading to loss of profits, and increased costs for veterinary care and treatment. In this project, which was completed for my undergraduate research thesis at the University of Saskatchewan, we used molecular microbiology to take a closer look into a factor produced by the biological agent that causes Swine Dysentery (SD). The combined challenges of antimicrobial resistance and public perception of use of antibiotics in animal production means that we as scientists need to be exploring other avenues of prevention and treatment.

#### Bio

My name is Hannah Burlet, and I am a recent graduate of the College of Agriculture and Bioresources at the University of Saskatchewan. As far back as I can remember I wanted to be a Scientist when I grew up. I have achieved that through earning my Bachelor of Science in Animal Bioscience. I will be attending graduate school at the WCVM in the coming years, continuing my research on this topic.

Environment

Economy & Industry

## **Gavin Blondeau, Alexandre Bratty, Ava Dulos, & Maria Levkovytska**

### **Urban Design Framework for a Social, Healthy and Environmentally Friendly Industrial Sector: Riel Industrial Sector, Saskatoon**

#### **Abstract**

Saskatoon's growth projections estimate a doubling of its population by 2050. Existing industrial sites will need to expand to accommodate new growth, however, working and visiting industrial sites is uninviting and stressful. As the city grows, the North Riel Industrial sector in Saskatoon is expected to provide jobs for many individuals. Planning an industrial site that honours the experience of workers and visitors alike is an essential part of building healthy communities. This design framework for the proposed North Riel Industrial Site Plan explores the many opportunities for future industrial sites' social, environmental, and economic integration. This work considers how to integrate industry while conserving and honouring biodiversity and how to build flexible infrastructure for future city expansion. Also, this work shows how the North Riel industrial has the potential to grow Saskatoon's economy while creating a vibrant community between workers and visitors.

Environment

Economy & Industry

## Gavin Blondeau

University of Saskatchewan  
Geography & Planning

Saskatoon, SK

Gavin Blondeau, a third year Regional and Urban Planning student is passionate about sustainability and building strong communities. He hopes to bring positive change to the fabric of urban life in Saskatchewan.

## Alexandre Bratty

University of Saskatchewan  
Geography & Planning

Vancouver, BC

I am a Regional and Urban Planning student at the University of Saskatchewan. I am keen to play a role in planning and implementing better communities. In my spare time, I like biking and watching movies.

## Ava Dulos

University of Saskatchewan  
Geography & Planning

Saskatoon, SK

I am a 4th year student studying Regional and Urban Planning student at the University of Saskatchewan. I have a special interest in design and hope to pursue a master's degree in urban design or architecture. In my free time, I enjoy drawing and cooking.

## Maria Levkovytska

University of Saskatchewan  
Geography & Planning

Khmelnitsky, Ukraine

I am a 4th year Urban Planning student at the University of Saskatchewan. I recently switched to the planning program, and it has become my passion. I now plan on pursuing a master's degree in architecture after graduation.

## Josh Christiansen

# Learning About Bats can Help Farmers and the Environment

University of Regina  
Biology

Regina, SK

### Abstract

Bats save the Canadian agricultural industry at least \$30 million every year as natural pest controllers. All eight of Saskatchewan's bat species consume thousands of insects every night making them incredibly important to the province's agricultural industry. Bats are also indicators of environmental health and are sensitive to changes in the environment. Saskatchewan is home to the endangered Little Brown Bat as well as two migratory species that are of conservation concern. Thus, it is important to understand bats' dietary habits and sensitivities to human activity to assess ecosystem functioning better, inform bat conservation, and ensure we maintain the effective, and free, pest control bats provide to our province's agricultural industry. I examined how human activity impacts bats, which rely heavily on sound for navigation and hunting, by assessing the diets of two of Saskatchewan's bat species in Cypress Hills, SK. I found the two species have similar diets, information that helps our understanding of these beneficial animals.

### Bio

Being surrounded by nature his entire life has given Josh a life-long passion for nature and the desire to protect it. Josh studies Environmental Biology and Ecology at the University of Regina and focuses his undergraduate research on Saskatchewan's bats. Josh is eager to make a difference for Canada's environment.

Environment

## Leah Houseman

### Getting Informed, Social Media, and Face Mask Use in Canada

University of Saskatchewan  
Sociology

Central Butte, SK

#### Abstract

Misinformation about preventative measures to reduce the spread of COVID-19 like mask-wearing is abundant. Canadians who can wear a face mask, but refuse to, work to prevent a return to “normal” for everyone. Therefore, it is vital to understand who non-mask wearers are, and where they access COVID-19 information. This study asks the questions:

- i. Are people who access information on social media less likely to wear a face mask?;
- ii. Do mask wearers and non-mask wearers differ by age, education, sex, or living area; and
- iii. Are those who validate the accuracy of information found online more likely to wear a mask?

When moving forward with the development of future public health advice aimed at preventing exposure to COVID-19 and other illnesses, this research highlights the unique needs of communities due to their differences in information gathering and demography.

#### Bio

I will earn a Sociology degree from the University of Saskatchewan this spring. I'm on a mission to understand social media's effect on information dissemination. I currently live in Saskatoon with my partner, our Boston Terrier, Marvin and our Frenchton, Frankie.

Media & Culture

Health



# **Disuri Dharmaratne, Hailey Ens, Rebecca Keindel, Wynee Mak, & Muhammad Mehdi**

## **Build-a-Business**

### **Abstract**

Build-a-Business addresses the need for entrepreneurship education for individuals living with disabilities in our community. Build-a-Business offers tailored workshops for individuals with disabilities who have an entrepreneurial drive. For the second year, Enactus University of Saskatchewan has run this project, adding on a prize of \$1,000 in capital funding for the best business plan. Build-a-Business is a response to our partner SaskAbilities, a Saskatchewan charity that offers programs and services for people with disabilities, seeking entrepreneurship education from our team. SaskAbilities provides various services, including services to help their clients find employment. However, SaskAbilities did not have services related to entrepreneurship for their self-employed clients. Enactus UofS and SaskAbilities decided to help (aspiring) entrepreneurs with knowledge and skills they can use to make their ideas into a reality or elevate their existing business to the next step. Enactus UofS has previous experience with providing financial literacy and entrepreneurship workshops. Build-a-Business is the next step to providing entrepreneurs with disabilities with the tools to expand their businesses.

Media & Culture

Economy & Industry

## Disuri Dharmaratne

University of Saskatchewan  
Edwards School of Business

Saskatoon, SK

I am a first-year student at the Edwards School of Business. I love spending time outdoors, traveling around the country discovering the beauty of nature.

## Hailey Ens

University of Saskatchewan  
Edwards School of Business

Provost, AB

I became project manager of Build-a-Business this year and I had so much fun creating a unique program for the people of the community.

## Rebecca Keindel

University of Saskatchewan  
Edwards School of Business

Saskatoon, SK

I am majoring in accounting. University has allowed me to apply classroom knowledge and help my community at the same time, which is truly rewarding.

## Wynee Mak

University of Saskatchewan  
Edwards School of Business

Saskatoon, SK

I am majoring in accounting, and will start my career at a local public accounting firm in the Fall. I like to explore new coffee shops, watch curling, and get wrapped up in aerial silks.

## Muhammad Mehdi

University of Saskatchewan  
Software Engineering

Dubai, United Arab Emirates

My name is Muhammad Ali Mehdi and I am an international student studying software engineering in computer science.

## Lilit Karapetyan & Avery Lockert

# Using DNA Sequencing to Determine the Effectiveness of Soil Reclamation Treatments

### Abstract

Soil reclamation is an extremely vital area of research right now for both economic and environmental reasons. This experiment was performed as part of the three-year research project being conducted by the Reclomit, Airterra and Saskpolytech. For this project soil samples from near Candle Lake were treated with various versions Biochar, a novel type of charcoal, to see how it affected the health of the soil and its micro diversity. In addition to observing the quality and amount of growth on these treated spots, samples of the treated soil were collected and sent to the Saskpolytech campus on Idylwyld in Saskatoon. Here the samples were prepared for Next Gen Sequencing, a technique that allows for the identification of a wide variety of microbes through the use of a database of DNA information. Using this technology, the Biochar variety that provided the greatest degree of biodiversity can be identified providing a great starting point towards furthering soil reclamation efforts.

Environment

Technology

## Lilit Karapetyan

**Saskatchewan Polytechnic**

**Yerevan, Armenia**

I am originally from Armenia. In 2002 I received my Master's degree in Biology from Yerevan State University, Armenia. In 2007, I finished my specialization in Microbiology. After immigration to Canada, I decided to apply for the Saskatchewan Polytechnic Bioscience Technology program. Now I am a student in that program.

## Avery Lockert

**Saskatchewan Polytechnic**

**Vibank, Sk**

My name is Avery Lockert. I was born and raised in Saskatchewan, spending most of my life on a farm near Vibank. I am currently completing my BioScience Technology diploma from Saskpolytech. Being able to combine my love of science and my farming background with this project has been an exciting experience.

## Krishna Kolen

# Air Quality and Respiratory Health: Asthma and COPD Prevalence Related to Wildfire Data in Southern Saskatchewan

University of Saskatchewan  
Geography

Calgary, AB

### Abstract

My project is a mixed-methods study that looks at archival air quality health index (AQHI) data from the Regina airshed from 2001 to 2021 and provides potential implications for respiratory health outcomes in southern Saskatchewan communities. I identified AQHI trends during wildfire seasons to provide potential implications on respiratory health outcomes during peak wildfire times. These implications were drawn from qualitative data analysis, in the form of a literature review, and provide results/outcomes that would be expected to be seen in respiratory health data in southern Saskatchewan communities at similar times, such as increased admittance to healthcare facilities and emergency departments for asthma and chronic obstructive pulmonary disease (COPD) during times of peak AQHI/wildfire smoke.

### Bio

I am an honours student in the Department of Health Studies with a concentration in Changing Climates and Health and a minor in Psychology. I was born and raised in Calgary, Alberta, but moved to Saskatoon for University in 2018. In my spare time, I enjoy hiking, camping, cooking, and watching Netflix.

Environment

Health

## Vaidehee Lanke

# Computationally Characterizing and Comparing Human and Bat Antiviral Type 1 Interferons

University of Saskatchewan  
VIDO Intervac

Saskatoon, SK

### Abstract

Bats are hosts of several emerging viruses which have passed into humans and livestock to cause severe and often fatal disease. However, bats infected with these viruses do not develop clinical signs of disease. Type I interferons (IFNs) are our first line of defense against invading viruses and lead to collectively promote an antiviral environment in infected and neighbouring cells. For my undergraduate honours thesis project, we tested the hypothesis that bats have evolved positively selected for residues within type I IFNs to mount a more pronounced antiviral IFN response compared to other mammals. Our research will contribute to understanding the evolution of these important immune proteins and determining if the bat immune proteins have evolved regions of these immune proteins differently than humans.

### Bio

Vaidehee Lanke is a honours undergraduate student studying bioinformatics at the University of Saskatchewan. She is interested in applying computational techniques to understand how biological and health systems work and shape our lives. Vaidehee is committed, through research and community engagement, to helping bridge the worlds between science and society.

Health

Technology

## Memphis Long

# An Analysis of the Quality of YouTube Content About Nutrition and Dental Caries

University of Saskatchewan  
Pharmacy and Nutrition

Hometown

### Abstract

Nutrition is critical for oral health; research shows that diet, combined with oral care, can help prevent dental caries. YouTube is currently a major source of health care information. Lack of regulation means that health-related content can contain claims, information, and treatments not founded in evidence-based science. This study looked at the quality of nutrition-related information in YouTube videos about nutrition and dental caries. Results found that the majority of content was produced by oral health professionals, but other health professionals had more views/day. Sugar was the most consistent topic mentioned. We concluded that there is a need for evidence-based content about nutrition, eating behaviors, and dental caries on YouTube, specifically by registered dietitians. More collaboration between nutrition and oral health professionals will provide the best possible quality care and information to the public.

### Bio

Memphis Long is a third-year student in the College of Pharmacy and Nutrition majoring in Nutrition. As a member of the Saskatchewan Pharmacy and Nutrition Students' Society, she acted as the Dietitians of Canada Senior Liaison.

Media & Culture

Health



## Jenna McEwen

### Catch and Release: Preserving the Ecological, Recreational, and Economic Benefit of Walleye Populations in Saskatchewan

University of Regina  
Biology

Regina, SK

#### Abstract

Recreational fisheries in Saskatchewan generate several hundred million dollars in revenue annually. Walleye (*Sander vitreus*) is the most popular sportfish species in Saskatchewan, and the most economically important species in Canadian recreational freshwater fisheries. In order to safeguard and grow its ecological, recreational, and economic potential for our Province, Walleye populations need to be carefully managed and a major approach to conserving sportfish populations is catch-and-release (C&R) angling. However, events such as competitive tournaments still represent a major stressor for fish, resulting in increased deaths of Walleye. This research shows that the most important factor affecting the survival of walleye is their behavior when tagged. This simple assessment of fish behavior may refine C&R best-practice guidelines for tournaments and conserve a valuable – and uniquely Saskatchewan – resource.

#### Bio

Jenna has always been fascinated with the science of the natural world. This led her to researching the impacts of human interactions with the environment. Jenna recently completed her final semester at the University of Regina for a Bachelor of Science Honours in Biology with a concentration in Cellular and Molecular Biology.

Environment

Economy & Industry

## Neelkumar Mistry

# Site Selection Assessment for a Small Nuclear Power Plant in Saskatchewan Using GIS techniques

Saskatchewan Polytechnic  
Geomatics and Surveying Engineering Technology

Moose Jaw, SK

### Abstract

Saskatchewan is one of the highest greenhouse gases emitters of Canadian provinces mainly due to the use of coal for electricity generation. It is also the world's second-largest producer of uranium. Reducing carbon emissions in electrical generation is one of the goals of Saskatchewan's Growth Plan of 2020-2030. Nuclear energy being carbon-free is a significant component of clean energy. Small Modular Reactors (SMR) can be used to generate zero-emission electricity and can play a critical role in reducing greenhouse emissions.

This study will investigate and identify suitable SMR sites across Saskatchewan. The primary objectives are to investigate how geographical siting activities fit into infrastructure development phases and to identify geographical factors that are likely to be used to define suitable sites based on safety, health, and environmental parameters. This project will facilitate SaskPower, Ministry of Environment, and SMR unit in their site selection process.

### Bio

I am currently doing my Advance Diploma in Geomatics and Surveying Engineering Technology at Saskatchewan Polytechnic, Moose Jaw campus. I am an international student from India. My previous education is in Bachelor of Civil Engineering. Apart from that, cricket is my favorite game and I also love to make some delicious food.

Economy & Industry

Technology

## Nicholas Montenegro

### A Geological Analysis of the Courtenay Lake Group, Wollaston Supergroup, Northern Saskatchewan

University of Regina  
Geology

Regina, SK

#### Abstract

This study investigates characteristics of the Courtenay Lake Group, the basal package of the Wollaston Supergroup, in northern Saskatchewan. The purposes are to define the sedimentologic and deformational history of this group further, and understand its context within the Wollaston Supergroup better and its possible role in localizing stratiform Zn-Pb and sediment-hosted Cu-Ag deposits. Three main units were identified: meta-sandstone, polymictic conglomerate, and mafic amphibolite. Three ductile fabrics and two sets of brittle structures were documented. D1 is theorized to have transposed all bedding into a northeast/southwest-striking composite S0/S1 subvertical foliation pervasive in the area. D3 then created a northeast-trending overprinting axial planar S3 crenulation cleavage which is interpreted to be associated with the Spence Lake synform. D4 later refolded S0/S1/S3, producing northwest-trending S4 crenulations. Future work will be devoted to petrographic and microstructural study of representative samples of each unit to further evaluate their nature and consider their potential relationship to mineralization within the Spence Lake synform

#### Bio

Nicholas is completing his Bachelor of Science Honours in Geology and calls Regina home.

Environment

Technology

## Julia Morelli

# The Darker Side of Beauty: Female Subjugation Disguised as Empowerment

University of Saskatchewan  
Political Studies

Viscount, SK

### Abstract

In today's day and age, beauty is a form of female empowerment. Women and young girls beautify themselves because it is liberating to feel good and express yourself through beauty. There is also a general feeling that our society no longer needs feminism, as women are (for the most part) equal to men. My research critiques these ideas and explores how today's social standards of beauty still (though inconspicuously) adds to female oppression. I argue that beauty processes are not an empowered and individualized action but instead continue the beauty myth. The beauty myth conditions women into subconsciously wanting to pursue beautification processes – perfect hair, nails, eyelashes, eyebrows and so forth. As a result, female conditioning creates a false impression of female choice and autonomy that ultimately reinforces male dominance – you have to be beautiful to be considered worthy. The goal of my research is to highlight the darker side of beauty ideals in hopes of educating young girls and bringing a new awareness to the female psyche.

### Bio

My name is Julia Morelli and I am a Political Studies student at the University of Saskatchewan. I grew up on my family's grain farm near Viscount, SK and spent my high school and early university years playing competitive hockey. After completing my degree, I hope to pursue a Master's in Political Studies.

## Margaret Musoke

### Barriers and Supports for Performing Physical Assessment on BIPOC Patients in Acute Care

Saskatchewan Polytechnic  
Nursing

Westville, South Africa

#### Abstract

Assessing the knowledge of acute care nurses' on culturally diverse care and assessments then providing education to equip the healthcare workers.

#### Bio

Margaret Musoke is a 21 year old 4th year nursing student in the University of Regina/Saskatchewan Polytechnic program. She has lived in Saskatchewan for 18 years, and is excited to graduate this August and make changes to the provincial healthcare system and education in nursing schools.

## Tamikani Nkhata

# Understanding Sexual Violence Can Lead to Better Supports for Victims

University of Regina  
International Studies

Regina, SK

### Abstract

A systematic study of sexual violence in genocide can potentially impact the process of prosecution, perception, and future research of recent conflicts. It can also help in the creation and delivery of culturally sensitive services and humanitarian efforts for refugees impacted by sexual violence. This project seeks to address a gap in existing research on sexual violence in conflict by a comparative analysis of the Bosnian and Rwandan genocide. It examines the difference in sexual violence across conflicts by looking at the historical context of each conflict, the perpetrators, forms, prevalence, and targets of sexual violence, by developing a classification system that considers the multiple perspectives involved in each situation. Through this approach, we can fully account for the legacy and impacts of sexual violence in the communities affected. The results reveal that, due to the historical context and the objectives of perpetrators in the Rwandan and Bosnian genocide, the forms, prevalence, and community impact of sexual violence varied in each case.

### Bio

Tamikani Nkhata (she/her) is from Malawi and is an undergraduate student at the University of Regina in International Studies and Political Science. Tamikani hopes to pursue a Master's of Arts degree in Women and Gender studies and apply her studies to support the effective implementation of intersectional feminism in critical programs and policies to eliminate gender-based violence.

Media & Culture

Health

## Jeannie Postnikoff

### Accessible and Affordable Outdoor Wellness Programs Benefit People with Brain Injuries

University of Regina  
Therapeutic Recreation

Regina, SK

#### Abstract

Outdoor wellness programs targeted towards people with brain injury focus on the province's disability strategy, with support for long-term, community-based programming potentially reducing health care costs. Adult members of the Saskatchewan Brain Injury Association (SBIA) registered for the "Brain Power Hour" exercise and walking program. Participants attended up to two, one-hour weekly sessions over the course of 12 weeks. Findings suggested that people with brain injury benefit from specialized exercise and recreational programming in the community. The Brain Power Hour program benefited participants by providing the supports necessary for people with brain injury to feel comfortable and safe while exercising, reducing social isolation for brain injury survivors, giving participants something purposeful to do, and assisting participants to improve physical and cognitive functioning.

#### Bio

Jeannie has recently completed her undergraduate degree in Bachelor of Sport and Recreation, majoring in therapeutic recreation at the University of Regina and hopes to soon become a certified therapeutic recreation specialist. Jeannie is eager to advance the therapeutic recreation profession in Saskatchewan.

Environment

Health



## Leanne Read

### Water you Waiting For?

University of Saskatchewan  
Art and Art History

Arm River, SK

#### Abstract

“Water You Waiting For” is a collaborative animated short that translates 16 of the most pressing water security issues facing Canada. Scientists associated with the Global Water Futures initiative were interviewed by me and Master of Fine Arts in music student Ricardo Martins. We translated what we heard into a digital animation and musical score under the guidance of professors Dr. Lori Bradford (College of Engineering and School of Environment and Sustainability), Dean McNeill (Department of Music), and Lisa Birke (Department of Art & Art History). The animation follows a water drop as it takes us on a journey across Canada to highlight the issues that are bringing the delicate balance of water sustainability to the tipping point but with a resounding chorus of hope.

#### Bio

Leanne Read is currently working towards a Bachelor of Fine Arts Honours degree at the University of Saskatchewan. She has developed a passion for animation, digital art, and sculpture. Leanne is the recipient of numerous scholarships and awards from the University of Saskatchewan. She is also a recent awardee of the Prince Edward Arts Scholarship from SK Arts.

Environment

Media & Culture

## Druval Shah

### Saving Lives by Gazing at the Night Sky

University of Regina

Physics

Regina, SK

#### Abstract

The stable elements we find on Earth today were created in awe-inspiring events such as supernovas. Understanding what happened when these elements formed allows us to manipulate them for specific purposes, such as medical imaging. Why does this matter? Nearly one in two Canadian will develop cancer during their lifetime and that number is not decreasing. Detecting cancer and tumours in their early stages is crucial to successful treatment and nuclear medicine and radiation therapy are essential in diagnosis and treatment. Building and using these diagnostic and treatment tools requires studies of radioactive elements and an understanding of their structures. My project focuses on studying these rare, difficult-to-produce, short-lived radioactive isotopes. This work has led to the discovery of valuable data that can lead to improved cancer detection, faster, more effective, and less costly treatments, and, most importantly, saving the lives of countless Canadians.

#### Bio

Ever gazed at the fascinating night sky? I did! All the time as a kid! It got me interested in Astronomy and eventually captivated me into pursuing an Honours degree in Physics. My research interests are in Nuclear Astrophysics, studying radioactive decays of rare elements. I like to read novels and go out for walks (especially in gloomy weather).

Economy & Industry

Technology

## Camrynn Simon

# Development of a Plant-Based Whipped Cream

University of Saskatchewan  
Food and Bioproduct Sciences

Battleford, SK

### Abstract

Traditionally, whipped creams are dairy-based. With the recent popularity of a plant-based diet, there is increasing demand for the development of dairy replacement. However, for whipped cream structure, typical characteristics of dairy protein and fat are critical and replacing them with alternative plant-based ingredients is quite challenging. In this project, the development of plant-based whipped cream was investigated with the use of coconut oil and pulse proteins to simulate the characteristics of dairy-based ingredients.

### Bio

I grew up in Battleford, Saskatchewan, the youngest of four children. I participated in a wide variety of sports, school activities, and music. I have a wide variety of hobbies, but I truly love cooking, baking, and really, food in general. This love of food naturally led me to pursue a Food Science Degree at the University of Saskatchewan. This degree allowed me to explore my love of food and follow an innovative career path, perhaps working towards finding ways to extend the world's food supply and developing new few products.

Environment

Economy & Industry

## Todd Stang

# Understanding the Nuclear Pore Complex May Improve the Lives of Persons Living with Multiple Sclerosis

University of Saskatchewan  
Biomedical Sciences

Macklin, SK

### Abstract

Nerve cells in our brain and spinal cord, which control almost all our activities, like thinking and walking, normally contain a protein called A1. In people living with multiple sclerosis (MS), this protein is abnormal. In normal people, A1 lives in the nucleus of nerve cells. In MS, A1 is trapped in the area surrounding the nucleus, known as the cytoplasm. Because A1 is stuck in the wrong place, nerve cells die and cause disability in those living with MS. For A1 to move from the nucleus to the cytoplasm, it must travel through holes in the nucleus. These holes are known as the nuclear pore complex, which is the focus of my research. I discovered that one reason A1 gets stuck in the cytoplasm is because the nuclear pore complex is abnormal! This is important because if we understand how the nuclear pore complex is injured, we can learn how to fix it and prevent nerve cell damage. In turn, this will prevent persons living with MS from getting worse, and thus dramatically improve their lives.

### Bio

Todd was born and raised on a farm outside a small town and is finishing his undergraduate degree in Anatomy & Cell Biology. He plans to continue his research on the nuclear pore complex in multiple sclerosis through enrollment in a master's program.

Health

Technology

# Jonah Sutter

## Small Plot Clubroot Detection

Saskatchewan Polytechnic  
Springside, SK

### Abstract

What is the goal?

- To detect the presence and severity of the clubroot disease in canola fields using remote sensing techniques.

Why is this research being done?

- Current methods of detecting clubroot require hand pulling plants and making assumptions of the extent of infection. Or mailing in soil samples to be tested in a lab.
- Hyperspectral imagery has proven to be capable of detecting many indicators of plant stress and other crop diseases.

How does this research benefit Saskatchewan?

- Working against the clubroot infection as it spreads across more canola fields each year with increasing crop loss over time.
- These non-invasive techniques can be extrapolated to limitless applications. Ex: metal poisoning, seed development and environmental monitoring.

### Bio

Graduate of Geographic Information Systems at Prince Albert Polytechnic. Current student in department of Geography and Planning at University of Saskatchewan. Born in Saskatchewan, lived in Yorkton, Prince Albert and Saskatoon. Enthusiastic about outdoor recreation and data/media production.

Economy & Industry

Technology

## Matthew Wilson

### Utilize Machine Learning for State-of-the-Art Cardiac ECG Classification

Saskatchewan Polytechnic  
Computer Systems Technology

Regina, SK

#### Abstract

This project aims to create a state-of-the-art machine learning model that provides solutions to the detection (and prediction) of abnormal heart patterns in electrocardiogram (ECG) signal data. The desirable goal is to save lives while also mitigating front-line worker fatigue, and benefiting cardiac specialists through cutting edge technology.

#### Bio

Matthew is a mature student of the Computer Systems Technology program at Saskatchewan Polytechnic. With an affinity for software development and artificial intelligence, he hopes to provide solutions that will benefit society in a wide range of fields.

Health

Technology

# Ying Ye

## Jet Boring System Optimization

Saskatchewan Polytechnic

Liuzhou, China

### Abstract

Cameco developed a remote mining method which called Jet Boring System. It uses high-pressure water to excavate ore body. According to the rock characteristic, water content, and frozen cavity body temperature, the jet boring system operators can vary the time spent mining each slice, the number of pumps pressuring water (jet pressure), and the rate of rotation of the water jet (RPM).

Saskatchewan Polytechnic Digital Integration Centre of Excellence (DICE) was contacted to make use of the vast amount of data Cameco has recorded. Due to the extensive drilling records and cavity information at Cigar Lake, there is an abundance of geological and geotechnical data, as well as mining equipment parameters from previous cavities to use in modelling. In this project, machine learning with over 350 previously excavated cavities were used to develop a data-driven solution aimed at assisting Cameco to optimally mine future cavities.

DICE developed a successful prediction Web Application. When Cameco user input the mining target cavity's parameter, the optimized Jetting Recipe will be generated. Field testing in October 2021 has provided very encouraging results.

### Bio

I have been living in Saskatchewan more than one decade. I used to be a housewife. Fortunately, Saskatchewan Polytechnic helped me to turn to be a working woman. In 2017, I enrolled in Computer System Technology in Saskatchewan Polytechnic. I graduated in 2020. Since then, I joined DICE team and attend the Jet Boring Optimization Project.

Economy & Industry

Technology

## Nahanni Young

### How Looking for Graphite Might be the Way to Find Uranium

University of Regina

Geology

Regina, SK

#### Abstract

The Athabasca Basin in northern Saskatchewan is a major uranium producer in the world. Graphite is believed to have played an important role in reducing uranium from  $U^{6+}$  to  $U^{4+}$  to precipitate uraninite, but the detailed relationship between graphite alteration and uraninite mineralization is not fully understood. For this study, samples were collected from the newly discovered Gryphon uranium deposits for petrographic and Raman spectroscopic study: the former aiming to further understand the cross-cutting relationships and paragenetic sequences, and the latter aiming to reveal the conditions of graphite formation and alteration. The focus of this work is to investigate whether or not graphite was directly used as a reducing agent in uranium mineralization. The results will have important implications for uranium exploration

#### Bio

Nahanni attends the University of Regina, where she is completing the fourth year of a bachelor of science with Geology as her major.



## Treyton Zary

# Major Saskatchewan Firms And Their Views On Climate Change Impacts On Their Supply Chains: A Look At Modeling, Mitigation And Adaptation, And Implications

University of Saskatchewan  
Edwards School of Business

Saskatoon, SK

### Abstract

Climate change impacts global supply chains that Saskatchewan relies on as a resource-based economy. Climate change and supply chains are not issues lacking attention; however, previous research has focused on specific industries or geographies, not specifically on Saskatchewan. Using qualitative interviews with firms critical to the functioning of Saskatchewan society, I am able to analyze how Saskatchewan firms are preparing for the impacts of climate change on their supply chains. Results from the interviews indicated preparations have been made by some Saskatchewan firms, but other firms have done little to prepare for climate change impacts on their supply chains. My findings allow the public and policymakers to gain a greater understanding of Saskatchewan society's readiness for climate change impacts, specifically those impacts that will affect the delivery of goods and services.

### Bio

I was born Saskatoon, but have had the fortunate ability to travel and receive an internationally focused education. In the fall of 2022, I'll continue my studies by beginning a master's degree in International Security.

Environment

Economy & Industry

## Twitter and the Taliban: Information Campaigning During the Takeover of Afghanistan

Due to the contentious nature of this research, we decided not to list this student's name, but they look forward to meeting you at the Legislature.

University of Regina  
Social Work

Regina, SK

### Abstract

In recent decades, social media has become one of the most important aspects of our lives. In an attempt to understand the harms inflicted by social media, we looked into the Taliban's use of social media in the six months prior to its takeover of Afghanistan on August 15, 2021. Drawing on tools created by the University of Regina's Center for Artificial Intelligence, Data, and Conflict (CAIDAC), we used artificial intelligence supported tools to map the Taliban's social media ecosystem, which includes more than 126,000 Taliban-affiliated accounts, along with 2 million Twitter posts. We identified the six key information campaign strategies used by the Taliban in the months prior to the takeover of Afghanistan. Misogynistic ideologies and misogynistic imagery were used by the Taliban to shape the Afghans perception of the Taliban and the Afghan government. With social media at their fingertips, Taliban now have access to different platforms aiding them to transfer their ideologies to the next generations of Afghans.

### Bio

I am an Afghan-Canadian student. I am passionate about seeking knowledge, conducting research, advocating, and raising awareness about injustices taking place in our society and the world.

Media & Culture

Technology

# Topic Categories

Each of the student projects has been sorted into categories, and the appropriate categories are listed on the bottom of each page.

There are five categories:

Environment

Media & Culture

Health

Economy & Industry

Technology

This system can help you identify which projects you might be most interested in learning about.

Following is an inventory of each category and which student projects belong to that category. Each student project has been sorted into two categories.

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