



POWERFUL POSSIBILITIES

From solar to wind to nuclear to biofuels, University of Saskatchewan researchers are working on a wide variety of eco-friendly alternatives to fossil fuels to power society's growing energy needs. We take a look at some of the options and some of the research currently underway across campus.

PAGES 8-9

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On Campus News aims to provide a forum for the sharing of timely news, information and opinions about events and issues of interest to the U of S community.

The views and opinions expressed by writers of letters to the editor and viewpoints do not necessarily reflect those of the U of S or *On Campus News*.

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City boosts support for Home Ice Campaign

JAMES SHEWAGA

The City of Saskatoon has significantly upgraded its financial commitment to help build a new twin ice-pad facility at the University of Saskatchewan by fall of 2018.

At its Feb. 27 meeting, city council approved increasing its commitment from \$1-million to \$4-million to help fund the \$41-million Merlis Belsher Place complex.

“We are extremely pleased with the city’s support for this project, which will serve not only the university, but will also provide much-needed access for the community as well,” said Tim Hodgson, chair of the Home Ice Campaign committee. “This substantial commitment brings us another significant step closer to reaching our fundraising goal so we can begin construction of a facility that is long overdue for the university and for the city.”

The city’s increased commitment is a major boost to the campaign as it begins the home stretch, with approximately \$1.8-million remaining to be raised to complete the fundraising drive in order to begin construction, possibly as early as this spring.

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An architect’s rendering of the Merlis Belsher Place complex, which will replace the aging Rutherford Rink.

“We still have plenty of work to do to reach our goal, but we are extremely encouraged by the community support that we have received so far and are determined to make this dream become a reality,” said Hodgson. “This partnership with the community, in particular the City of Saskatoon and the Saskatoon Minor Hockey Association, is vitally important for our

university and critical to the success of this project.”

The new multi-purpose facility, backed by a record \$12.25-million gift from U of S alumnus Merlis Belsher, will feature two ice surfaces that will be home to Huskie Athletics hockey teams, as well as 1,500 hours of ice time each year for community hockey programs. The facility, which will be used to host a wide variety

of campus and community events, will also include two basketball practice courts for the Huskies men’s and women’s teams, courtesy of a \$4-million donation from long-time supporters Ron and Jane Graham.

The Home Ice Campaign team will now focus on the final push to secure support and funding to replace the aging Rutherford Rink, which was built back in 1929. ■

For more information, or to donate to the new facility, please visit home-ice.ca



IN CASE YOU MISSED IT

A lot happens at the U of S during the weeks when *On Campus News* isn’t published. Here are a few of the top stories from news.usask.ca:

U of S, FSIN sign new agreement

The University of Saskatchewan and the Federation of Sovereign Indigenous Nations (FSIN) signed a memorandum of understanding on Feb. 3 to strategically work together to improve the academic success of First Nations students. The agreement, signed by U of S President Peter Stoicheff and FSIN Chief Bobby Cameron, enhances communication and collaboration.

Researchers tackle epilepsy

The pediatrics department at the University of Saskatchewan announced on Feb. 1 the launch of a study examining the use of Cannabidiol (CBD) to treat children with medically intractable epilepsy and associated cognitive decline. The department received Health Canada approval to proceed with the study to determine CBD oil’s impact on improving quality of life for children.

NSERC grants supports research

University of Saskatchewan researchers were awarded close to \$1.5 million by the Natural Sciences and Engineering Research Council of Canada on Feb. 15. Angela Bedard-Haughn of the College of Agriculture and Bioresources is researching how land use and climate affect soil, while Qiaoqin Yang in engineering is exploring improving the durability of biomedical implants.

Geyer’s team explores imaging

Newly-funded research in the College of Medicine could shed light on glioblastoma, the most common primary brain cancer in adults. Ron Geyer and his University of Saskatchewan research team were awarded an Innovation grant from the Canadian Cancer Society of close to \$200,000. They plan to develop new imaging probes to better visualize and detect tumours in the brain.

FOR MORE UP-TO-THE-MINUTE NEWS, VISIT: news.usask.ca @usask



Faculty, staff and students of the School of Environment and Sustainability gather outside Kirk Hall.

SUBMITTED

SENS @ 10:

A decade of championing environmental sustainability

CHRIS MORIN

When the School of Environment and Sustainability (SENS) first opened its classroom doors at Kirk Hall in 2008, a total of 10 students were in attendance. It was a small group, but those who were there were eager to learn from faculty with diverse backgrounds and disciplinary orientations.

It took a lot of work to carve out a space for the new graduate school within the University of Saskatchewan. Being one of three new graduate schools approved in 2007, SENS was met with concerns among some of the faculty that students would have to choose between SENS and other units on campus that were already well-established.

But, on that first day of class, Sept. 2, 2008, that nervousness quickly turned to excitement, according to Maureen Reed, professor and then-acting director of SENS.

“The faculty were like racers at the starting gate—excited, nervous and eager—and hoping that all our preparation to this point was sufficient for us to make our mark,” said Reed, who now serves as assistant director of SENS. “I think there was excitement that we could try new things and an eagerness to listen to one another, learn and celebrate and reconcile our differences.”

In addition to the 10 students,

there were five core faculty members at that time. Now, SENS has grown to include a PhD program, an undergraduate certificate and three master’s programs, having launched the Master of Water Security in 2016. The school attracts talent from around the province, across the country and all over the world.

Toddi Steelman joined SENS as executive director in August of 2012, and has seen the school grow to include students representing 26 countries, as well as a cultural mix of Canadians that includes First Nations and Métis.

“I would say that we have matured significantly in 10 short years,” said Steelman. “SENS is tackling complex sustainability challenges related to global water security, biodiversity conservation, food security, and governance through problem-oriented, collaborative, community-based scholarship where disciplinary expertise is complemented by a strong interdisciplinary ethic. We are an important part of making the province, nation and world a better place to live.”

Now, with more than 100 alumni to date, SENS hopes to bring students past-and-present together for a gala event to celebrate the school’s 10th anniversary. The event, billed as SENS @ 10, gives alumni an oppor-

tunity to catch up with classmates, make new acquaintances, participate in behind-the-scenes tours and learn about what’s new with the school.

In addition to a number of events starting March 31, the celebration culminates with a special gala on April 1, an evening to showcase research, entertainment, art, and keynote speakers including Rosanna Deerchild, an award-winning Cree author and the host of *Unreserved* on CBC Radio One, as well as Thomas E. Lovejoy, widely regarded as the godfather of biodiversity.

While there are plenty of reasons to celebrate, including the school’s recent Delta Days Traveling Display tour, Reed said she is most proud of the sense of community that SENS has helped bring to the U of S.

“We have spent a great deal of time in learning from each other to build research programs and teaching programs that are truly innovative and responsive to the world around us,” she said. “But underlying it all is an unflinching commitment on the part of faculty, staff, students and leadership to make SENS a special place to be.” ■

Chris Morin is a communications specialist in the Global Institute for Water Security and the School of Environment and Sustainability.



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Nursing college nurtures Indigenous student success

✍ HENRYTYE GLAZEBROOK

Jennifer McGillivray got into nursing simply because she wanted to see more people of her heritage in the field of health care.

She would visit the doctor and be helped by nurses and doctors of all ethnicities, but she was rarely assisted by any Indigenous people.

“I noticed that I never had an Indigenous nurse who I could go to, and who I felt comfortable with—someone who had the same background as me,” McGillivray said.

“I felt intimidated to be in a health-care setting where there were no other Indigenous people. I was the brown girl. I stood out.”

McGillivray is now a third-year student in the University of Saskatchewan’s College of Nursing, vice-president of the Indigenous Students Council, and a proud example of how far the college has come in making Indigenous recruitment and retention a priority.

In the last few years, the U of S

has seen an increase in enrolment and retention of Aboriginal students across the board, particularly in its nursing program. As of the 2016-17 academic year, the College of Nursing features 17.7 per cent of its students self-declared as Indigenous, and has a retention rate of 93 per cent for those who are already enrolled.

These kinds of statistics came as a welcome surprise for nursing administration. When the program moved away from direct-entry in 2012, there was worry that the new model would be less appealing for at least some Aboriginal students.

“There was some concern that we would lose Aboriginal students without direct-entry, because there can often be risk aversion in terms of taking an extra year or two of school and not knowing they’re going to get into nursing,” said Heather Exner-Pirot, strategist for outreach and Indigenous engagement with the College of Nursing. “It’s turned out that our numbers have actually grown.”

Despite initial concerns, the shift away from direct-entry has actually worked to increase retention rates. The goal, Exner-Pirot said, was that time in arts and science classes would give students the academic background and study skills needed to succeed in an intensive, science-heavy program such as nursing.

But entry re-structuring is only one change that has helped bring in more Indigenous students, and inspire them to stay with their studies year after year.

Exner-Pirot pointed to distributed sites—which allow students to learn the same nursing program they would cover in Saskatoon on U of S campuses located in communities such as Prince Albert, La Ronge and even small municipalities like Île-à-la-Crosse—as a huge step the college took toward making education more accessible.

“The students that are coming to these distributed sites aren’t the ones who are going to move across



Jennifer McGillivray is on the U of S Indigenous Students Council. 

the province to come to school,” she said. “These are the ones who have family obligations, they’re often mature students, many of them are parents themselves, and so they probably wouldn’t have moved away from all those commitments for their education to begin with.

“Île-à-la-Crosse is a community of about 1,800 people, and you can do an entire U of S nursing degree right there in the town.”



Exner-Pirot

Other supports, such as bursaries for science and math, as well as the U of S Community of Aboriginal Nurses—which directly promotes recruitment in First Nations groups—likewise encourage Aboriginal students to hone skills they’ll need for nursing prior to stepping on campus.

These are all steps which students like McGillivray believe

are helping—alongside projects like the Gordon Oakes Red Bear Student Centre—to build a strong community for Aboriginal students at the U of S, in the college, and beyond.

“School shouldn’t be a place of isolation, which can be lonely or depressing for some,” McGillivray said. “I think that creating a sense of community is what helps to create retention.”

McGillivray is hoping to see a greater emphasis on experiential learning, an approach that takes students in programs such as medicine or nursing directly to the Indigenous elders and community members they’ll one day be treating, to better understand their culture, community, struggles and perspective. But in the meanwhile, she’s proud to see indigenization on campus gaining momentum.

“We’re moving in the direction of education, which is what our ancestors wanted us to do,” she said. “I think walking in both worlds of culture and community, as well as education, is what will create success.

“For most of us we are the first in our families to work towards getting a degree. We don’t have other professionals in our family to act as mentors or to look up to ... We are breaking new ground and trailblazing a path for our communities.” ■



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New nutrition lab feeds research needs

LESLEY PORTER

For Carol Henry, one word can open up a lot of doors.

“Food—just that one term generates so many things,” said Henry, the assistant dean of nutrition and dietetics, as well as a professor within the division.

The subject of food is at the forefront of the College of Pharmacy and Nutrition’s undergraduate food lab, newly-opened on March 3 in the B-wing of the Health Sciences Building.

Complete with a large commercial kitchen comprised of 24 cooking and prep stations, adjacent research space and seminar rooms, a commercial dishwasher, and an expansive storage area with a walk-in fridge and freezer, the space provides students with a modern environment to practice their skills in nutrition research and food service training.

First and foremost, Henry explained, the lab has to be a training ground for students, tackling the hands-on skills needed for a career in nutrition and dietetics—such as creating modified meal plans or safely wielding a kitchen knife.

“But we also want, through our programs, for it to be an outreach into the communities,” she continued. While “we haven’t figured all of this out yet,” she noted that organizations such as the Friendship Inn may benefit from the lab’s “planned overages” through donations of food.

“As it benefits students, it could also benefit the community at large,” she said. “It has to do both.”

At a more macro level, Henry hopes the lab also encourages students to think more critically about the role of food in society.

Speaking passionately about global food systems and health promotion, she sees the potential for the lab to address issues of food security locally, nationally and even internationally. Henry used a common household staple—milk—



Professor of nutrition and dietetics Carol Henry in the new nutrition lab in the Health Sciences Building. LESLEY PORTER

as an example.

“The carton I get here for four or five dollars, up north, is 13 dollars. So when I talk to northern residents about healthy eating, how do you get around that?”

The issue permeates further to developing countries like Ethiopia and Uganda, where Henry has also done considerable research on food security and food systems.

“All of this impacts the person’s health and their ability to get food,” she continued, “so we have to address all of those.”

Fortunately, when it comes to food research, there are many interdisciplinary connections to be made. While research and education links within the health sciences make sense, “we’re also connected to the College of Agriculture and Biore-sources—because we have to eat food,” said Henry.

Similar links exist with the College of Kinesiology.

“When you look at health, the environment, nutrition and physical activity, there’s a natural link there as well,” she said.

The new lab will replace its smaller predecessor in the basement of the Thorvaldson Building,

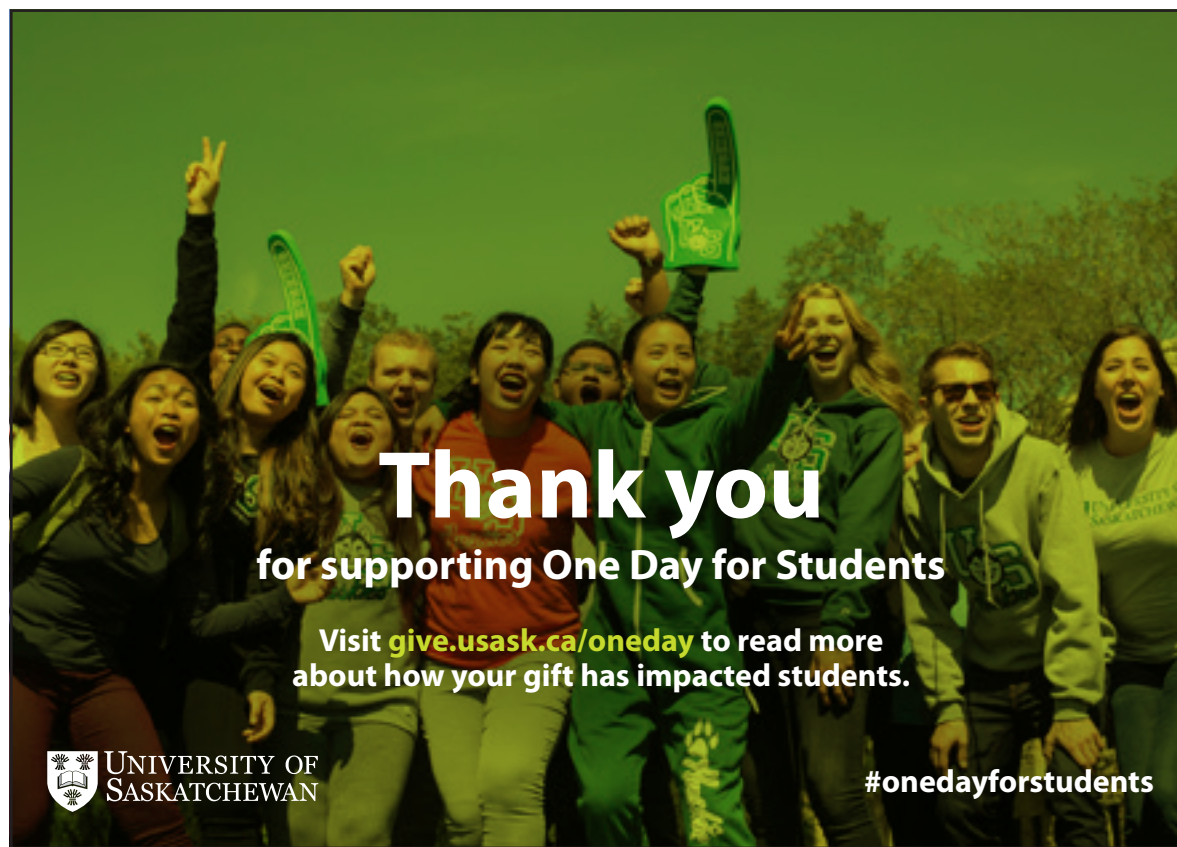
constructed for the now-defunct College of Home Economics. The older lab could only accommodate a maximum of 12 students, Henry explained, which impacted the curriculum as lab time had

to be broken up throughout the week. The new larger lab, however, accommodates more people so the lab time can be held on one day, “and with that timeslot we can do a lot more.”

“We can see greater potential of how this concept of food and the practical application of it can bring several disciplines to address food security in Saskatoon, the province and elsewhere.”

Carol Henry

“When we were in the basement of Thorvaldson, we saw potential to this level,” she said. “But now as we sit here and look out there, we can see greater potential of how this concept of food and the practical application of it can bring several disciplines to address food security in Saskatoon, the province and elsewhere.” ■



Wilson wins coveted national teaching award

✍️ HENRYTYE GLAZEBROOK

When he found out that he had won the 3M National Teaching Fellowship, University of Saskatchewan associate professor Jay Wilson was secretly thrilled that he could take a break from writing about teaching.

Now he's looking forward to working with others who are similarly interested in bringing weighty recognition to their campus.

"Knowing that I never have to write another application based on my teaching philosophy again—and I've written lots of those—is great," Wilson said with a smile. "They're good to do, but you can only reflect so much. I think it's time for me to mentor other people and help them to accomplish their goals."

Wilson was selected by 3M Canada and the Society for Teaching and Learning in Higher Education for his teaching, mentorship and research in the U of S College of Education, where he both instructs classes and is the department head of curriculum studies.



Jay Wilson is an associate professor and the head of the Department of Curriculum Studies. ✍️ HENRYTYE GLAZEBROOK

The 3M National Teaching Fellowship is the highest teaching honour in Canada, awarded to only 10 recipients each year from coast-to-coast. It is also one of a plethora of prestigious prizes Wilson has received over the course of his

career, including the Master Teacher Award in 2015—the highest teaching honour at the U of S—and the Provost's Outstanding New Teacher Award in 2010.

"This is the pinnacle of recognition for teaching and learning

“ This is the pinnacle of recognition for teaching and learning in Canada. It doesn't get any better than this, so I'm very humbled and very honoured.”

Jay Wilson

in Canada. It doesn't get any better than this, so I'm very humbled and very honoured," he said, adding that he's adamant that no award is won individually.

"I try to keep things in perspective. Teaching is teamwork. There's lots of people who have mentored me and lifted my ship, so to speak—and I'm really thankful for that support—so I don't think about it

solely as an individual honour, even though my name is on it."

Wilson said he is hopeful his recognition will help keep the spotlight on the U of S as a whole, and credits the campus for being a pillar in his life as he has grown as a teacher over the years.

"This campus is already recognized across Canada as being very supportive of teaching and learning," he said. "I think the award reinforces the fact that we have an environment that fosters positive growth in our teaching and learning leadership."

What Wilson said he's most excited about at this point is focusing on his classes, inspiring the next generation of young teachers to strive for the same level of success as he has achieved.

For the time being, he's putting awards aside.

"The Nobel Prize is the only thing that's bigger than the 3M," he said, laughing. "And there's not much chance that's going to happen." ■

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SERI living wall brings education to life

HENRYTYE GLAZEBROOK

Walking into the Sustainability Education Research Institute (SERI), the first thing that catches your eye is its living wall—a floor-to-ceiling display of plant life draped down both sides of a dividing partition between the main area and a small meeting room.

The experience is like stepping through a doorway to another world.

SERI is nestled deep within the heart of the University of Saskatchewan's Education Building, where it has carved out a home unlike any other on campus. Though it is only made up of a few small rooms and offices, the institute's emphasis on using reclaimed and repurposed materials as focal points for its green-space headquarters has created an office both wholly unique and remarkable.

"We wanted to create a green-designed space that would also be a model for a different way of doing things," said SERI Director Marcia McKenzie. "It's not just the work that we're doing, but also the space we are doing it in and how that exemplifies our commitments to sustainability. All the wood is reclaimed grain elevator wood, including the main feature wall as well as the tables. The metal table fixtures are piping, reclaimed as well. The cabinets are repurposed lockers from a high school, the light fixtures are repurposed from elsewhere on campus."

SERI is a collaborative unit focused on research furthering the understanding of sustainability in education. The institute was founded in 2012 through \$101,000 in funding from the Canada Foundation for Innovation, with an additional \$150,000 in funding from the College of Education.

"Our mandate is to draw together faculty, graduate students and other members of the univer-

sity and surrounding community who are working on research to do with land place, environment and sustainability in education, to bring them together in a single hub and build on that work moving forward," McKenzie said.

While SERI is one of several U of S institutions that work in green areas, including the School of Environment and Sustainability (SENS), the Global Institute for Water Security (GIWS) and the Office of Sustainability, what sets it apart is its emphasis on wrapping concepts familiar to these other units inside of an all-encompassing focus on education.

"Whereas SENS is interdisciplinary across many different areas and GIWS is focused on water particularly, SERI is specifically centered on education," McKenzie said. "It's the only research centre in Canada with the focus on sustainability in education. All of our activities have those three threads of sustainability, education and research. Those are our niche; they set us apart."

With the number of students, researchers and faculty members involved with SERI, there are a variety of projects connected to it at any given time. In recent years, the institute has begun hosting a biannual conference, jump-started its monthly *Talking Sustainability* seminar series and partnered on a new community journal focused on place, land and learning.

SERI has launched several research ventures, including a digital media project looking at Indigenous, newcomer and settler youths' orientations to place and sustainability. McKenzie describes the study as an "action research project" intended to collect research data, as well as to train youth in digital media skills so they can amplify their own voices

and opinions on sustainability issues within their communities.

The current flagship project at SERI is a \$2-million Social Sciences and Humanities Research Council partnership grant examining sustainability policies and practices in formal education from kindergarten to post-secondary levels across Canada.

"We just finished collecting data at six different post-secondary institutions and 20 elementary and high schools across six different provinces and territories, to look at how they are engaging with sustainability in practice and then examining that in relation to their policy mandates," she said.

Prior research projects of the Sustainability and Education Policy Network have included a census on sustainability uptake in policies across all 220 post-secondary insti-



Director Marcia McKenzie stands in front of the living wall. HENRYTYE GLAZEBROOK

tutions, 13 ministries of education and 374 school divisions across the country, as well as a national survey.

McKenzie said addressing sustainability issues will continue to become more and more important as society moves forward.

"In terms of critical issues of our times, climate change is one of the most pressing issues we're

facing," McKenzie said, adding that sustainability is among the priorities recently laid out in the U of S mission, vision and values statement. "Health, migration and all sorts of other associated issues are connected to a changing climate. It's obviously a very important concern and effective education is key in responding." ■



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Powerful possibilities

U of S experts weigh in on solar, wind, nuclear and biofuels

MICHAEL ROBIN and HENRYTYE GLAZEBROOK

Weaning the world from its fossil fuel addiction is a mammoth task that not only includes coming up with new ways to generate energy, but also storing it and transforming it for society's needs, from smart phones, toasters and steel smelters to scooters, cars, trucks and trains.

Tim Kelly's strategy is to go directly to the energy source that powers all life on Earth: the sun.

Kelly holds the Canada Research Chair in Photovoltaics in the Department of Chemistry at the University of Saskatchewan. He said solar energy has its limitations, as his father found out when he bought a small solar panel for the family cabin in Newfoundland. The idea was to use it to charge a battery pack to run the radio.

"He gives me a call once he gets back from the trip and says, 'Hey Tim, these solar cells, they don't work. It took forever to charge anything,'" Kelly recounted. "I said, 'OK Dad, you're in St. John's. The prevailing weather pattern is rain, drizzle and fog.'"

Newfoundland may not be ideal for solar, but it's a different story on the Prairies.

"The average installation in southern Saskatchewan or southern Alberta is as good as it gets anywhere in Canada," Kelly said, explaining sunshine should be seen as another resource, like agriculture, uranium and potash.

Kelly does provide caveats. For instance, it would be quite difficult for the average city dweller to go completely off-grid with a few rooftop solar panels.

"They can significantly offset your consumption," he said, but to really make a difference a home needs to be optimized to conserve energy, with things like low-draw lighting and appliances, especially ovens, refrigerators and laundry equipment.

Then there's the cost. While the price of solar has come down significantly, Kelly said average home installations can cost \$10,000 or more. This means incentives such as rebates need to be in place.

"When you're trying to argue with a homeowner, 'I know you really want that nice kitchen renovation, but why don't you put this solar panel on your roof instead?'" Kelly said. "The new islands in the kitchen tend to win that emotional battle."

Another challenge is large solar farms covering significant areas—ideally on marginal lands or desert—are needed to produce the megawatts used by public utilities. But Kelly said it is still well worth pursuing.

"It's an interconnected web, and solar can be one part of the solution,"

Associate professor Tim Kelly, the Canada Research Chair in Photovoltaics in the Department of Chemistry.

Kelly said. "It can be a huge percentage of your overall grid needs."

Caution to the wind

Solar is an intermittent power source, cycling with day and night and with cloud cover that causes spikes in output. This is also an issue with wind power. Researcher Rajesh Karki evaluates the reliability and cost of incorporating wind and solar energy into the power grid.

Both physical and economic factors drive wind power, said Karki, a professor in

the Department of Electrical and Computer Engineering.

Ideally, turbines should be in locations with different wind conditions, so when one area is calm, wind is blowing in another. But the owners of wind turbines are paid by how much energy their machines can put into the grid, so they generally build where the best wind resources can be found. In Saskatchewan, this is largely in the southwest corner of the province.

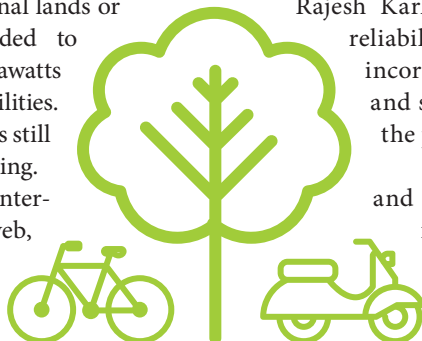
"Most of the existing wind turbines are in one region, so that creates a problem of all turbines being affected by the same wind regime," Karki explained.

Another restraint is turbine design, which Karki said is optimized for coastal areas. Such turbines need wind speeds of

45 kilometres per hour (kph) to produce their rated power output. Lubricants are also not designed for Canadian winters, stiffening up and stopping the turbines at temperatures of -20C and below. Icing, which changes the aerodynamic shape of turbine blades, is another major concern.

"The problem in Saskatchewan is when the demand is high, it's usually on a very cold day," Karki said. "If you've got a lot of wind power, say for example—(proponents) are talking about 50 per cent dependence on wind—then we would be out of power on a very cold winter evening."

Turbines that can harvest lower wind speeds and are able to operate at colder temperatures are



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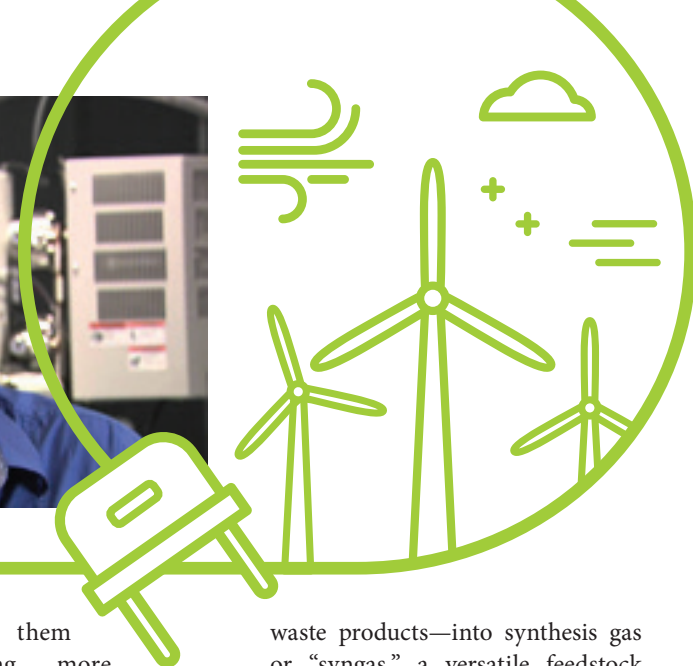
Dalai



Karki



Szpunar



needed. As well, Karki explained that connecting Canada's power grid better would allow for more use of wind power.

"The wind is always blowing somewhere," he said.

Price to be paid

The Achilles' heel of wind and solar and other renewables is intermittency—generating everything from excessive power to nothing at all, depending on the vagaries of time, weather and season. This is where another of Karki's research areas—energy storage—comes in.

"This is a huge amount of energy, so just battery energy storage alone is not practical or feasible," he said.

Karki is looking at strategies such as compressed air stored in underground reservoirs and massive flywheels that store energy as momentum.

But what all options have in common is cost: extra infrastructure and operating margins required by renewables including solar panels, wind turbines and grid-scale storage.

"If you look at the price of electricity in Europe ... because they have invested a lot more in renewables, they're paying maybe between two and three times what we pay here," Karki said.

Pieces of the puzzle

Cheap and abundant, fossil fuels are most tempting to the developing world. While the developed world can afford the latest new

LED lights, energy efficient appliances and electric cars, the poorest countries cannot.

"With wind and solar, these methods of electricity generation are much more expensive than coal," said Jerzy Szpunar, Canada Research Chair of Advanced Materials for Clean Energy and a professor of mechanical engineering at the U of S. "We like clean energy, say wind for instance, but one has to realize that wind is not always blowing."

Szpunar said that even with alternatives to fossil fuels being aggressively pursued to combat climate change—including carbon capture, solar, wind, geothermal, tidal and nuclear—mainstays such as coal remain "to this day, and probably for a long time, a major resource for the production of electricity."

Unlike other low-emission sources of energy, nuclear power faces major hurdles such as funding and public perception.

France gets more than 75 per cent of its electricity from nuclear, but is not seen as green energy. Germany is lauded for its aggressive Energiewende wind and solar program that by some estimates supplies about 30 per cent of the country's electricity. But since abandoning nuclear energy, Germany now burns far more coal from one of the largest strip mines on Earth.

"I think France considers it good business," Szpunar said. "They are not only supplying so much of their electrical energy through nuclear power, they are also selling

electricity—and quite a lot of it. They developed a very good reactor and they are also exporting many of them throughout the world. That is also a very good business for them."

What a waste

Probably the biggest hurdle facing nuclear power is that of waste.

"At present, all of the countries that rely on nuclear energy store the byproducts temporarily," Szpunar said. "They are expecting that the storage will be decided later on."

He explained that there are some options for re-processing nuclear waste.

"In France they recycle the waste, which does not mean they don't need to store any materials, but just that the amount is minimized," he said. "As a result, the amount of radioactive materials which have to be stored for a very long time is smaller than in the states, for instance, where there is no option for re-processed fuel."

New technological options, such as a liquid salt reactor, could help to further reduce the amount of waste by-products.

"In the future, if these kinds of new reactor designs were implemented, then the amount of material which would have to be stored would be minimized probably by up to one thousand times less than at present," he said.

Szpunar added that options typically viewed as eco-friendly, such as wind and solar power, have their own setbacks that have

prevented them from being more widely implemented.

"When the wind isn't blowing, the utility companies have to be ready to replace it with some other form of energy," he said. "That can change, a lot, the price and cleanliness of clean energy. If that replacement is made using a coal plant, then that plant can't be started all at once. They have to be running on low power, and running on low power creates almost as much pollution as high power."

The bottom line, he stressed, is that all energy technologies have pros and cons, but society cannot afford to discard one out of hand because of a perceived challenge.

Power to move

One of the great advantages of fossil fuels is portability. While electric cars have made inroads, nothing beats petroleum when it comes to moving mass commodities and products over long distances.

"How do you get your trucks running and planes flying?" asked Ajay Dalai, Canada Research Chair in Bioenergy and Environmentally Friendly Chemical Processing. "You need jet fuel and you need diesel fuel."

Dalai and his team are working to challenge fossil fuel dominance.

"I believe no matter what you do, you still need liquid fuel from renewable sources," he said.

One of Dalai's and colleague Hui Wang's patented processes uses a catalyst to turn methane and carbon dioxide—two abundant

waste products—into synthesis gas or "syngas," a versatile feedstock used to produce everything from plastics to jet fuel, diesel fuel and gasoline.

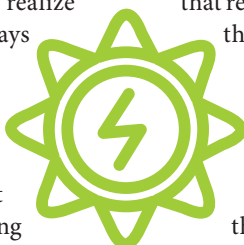
Dalai explains methane can come from different sources. It's routinely burned as waste when it occurs in oil wells and is also produced when organic matter breaks down, for example, in landfills. Since it's about 25 times more potent than carbon dioxide as a greenhouse gas, it makes sense to not just let it escape into the atmosphere.

Carbon dioxide can also be a waste product from coal-fired power plants and is as a byproduct from fermentation used to create fuel ethanol. One Ontario company has licensed Dalai and Wang's technology and is working to scale it up, using methane from biomass and carbon dioxide from an ethanol plant.

Dalai explained his group's focus has shifted away from simply publishing papers—he has put his name to more than 400—to patents. These cover strategies to boost efficiency in ethanol and vegetable-based diesel production, and scrub mercury and carbon monoxide from power plant flue gases.

"We're getting patents to move this (knowledge) into industrial partners' hands as soon as possible," he said.

Weaning the world from its fossil fuel addiction may not yield to a single solution, but to diverse ideas from many experts, borne of research, innovation, and political will. ■



Creative campus collaboration

Medicine and computer science researchers working together to improve medical imaging

 MARG SHERIDAN

An ongoing collaborative research project between the College of Medicine and the Department of Computer Science at the University of Saskatchewan is focused on improving the accuracy of medical imaging diagnosis.

The team is hoping to not only speed up how quickly thyroid nodules are diagnosed, but improve how accurate the diagnosis are.

“From the research side, we have strong potential to be able to reduce the overall system costs by avoiding unnecessary invasive procedures in some patients,” said Dr. Paul Babyn, the head of the department of medical imaging. “And that would obviously save that individual patient from having a biopsy or surgery when they don’t need it.”

The potential to improve the diagnosis process builds on Babyn’s previous work with Dr. Gary Groot (surgical oncology) and professor Ekta Walia (computer science) on thyroid tumours.

“We know that use of thyroid reporting systems, with the human doing the interpretation of the images, improves results,” Babyn explained. “Use of a scoring and reporting form provides information in a standardized fashion for both the surgeon and pathology and reduces variability.

“We know that there are limitations to the application of the human scoring system, as they require additional time and expertise not always available



Dr. Paul Babyn is the head of the Department of Medical Imaging in the College of Medicine.

 MARG SHERIDAN

within a busy practice setting.”

The scoring system allows trained radiologists to classify thyroid lesions as either “not suspicious,” and therefore not in need of biopsy; “very suspicious,” and in need of an immediate biopsy; or “less suspicious,” but still in need of biopsy or follow-up. Getting it correct right off the bat can reduce the number of patients needlessly undergoing biopsies or surgical procedures.

“So there’s the potential for a machine learning system to

provide a reproducible interpretation with the scoring system,” Babyn continued. “That would allow improved output for the radiologist, as well as improved clarity for the surgeons.”

Babyn had already been working with computer science researchers in the College of Arts and Science to review computer-assisted diagnosis for thyroid cancer. But with ongoing advances in deep-learning, they decided to apply some newer technology to the problem of thyroid nodule diagnosis.

“We’re using techniques that are called deep-learning algorithms,” explained Mark Eramian, an associate professor in computer science who has been helping lead the research.

“We are analyzing the ultrasound images with the computer and trying to predict with high accuracy whether these are likely to be benign or whether we should do further, and more invasive, tests to be sure that they aren’t malignant.”

Traditional machine learning requires a person to determine

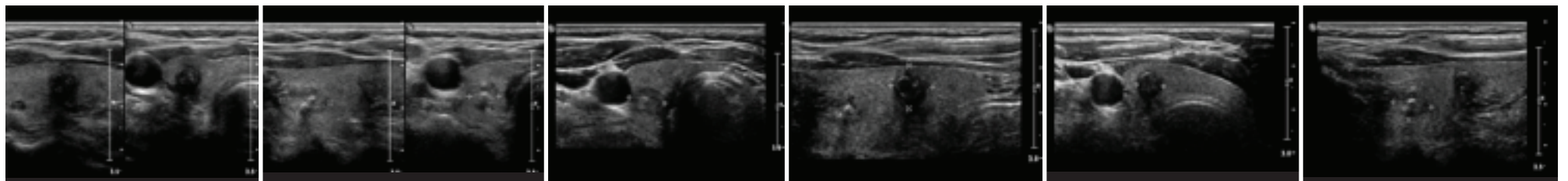
the distinguishing features that a computer analyzes to make a determination—the kind of technology used by red-light cameras or with license plate recognition systems. But with deep learning, the distinguishing features are not determined by a human. Instead machine algorithms are used to learn not only how to interpret the features to make the diagnosis, but also the features themselves.

“That allows many more possible distinguishing features to be considered than a human could reasonably consider in a lifetime,” Eramian continued. “We have a data set that is annotated so we know from the biopsies whether the nodules were malignant or benign, and learned features are attributed to those annotations. By considering and optimizing so many features, we end up with a better decision-making tool.”

Of the 2,500 images the team is using, 1,600 were selected as a training data set so that a deep neural network could learn the features and classifiers. Some 400 images, which the network had never seen before, were then used for testing so that it could make its prediction regarding the nodule, which the researchers could then compare to their results.

After having done 10 training/validation/testing variations with the network, the team was getting an average accuracy of 92 per cent.

SEE RESEARCHERS, PAGE 15



Price, Dadachova join nuclear medicine experts

 MURRAY LYONS

The University of Saskatchewan is known for its pioneering role in nuclear medicine with the cobalt-60 technology developed in the early 1950s that revolutionized cancer treatment around the world.

The U of S is again on the leading edge of nuclear medicine, thanks to two researchers recently recruited from New York and the state-of-the-art facilities that support their work.

Eric Price and Ekaterina (Kate) Dadachova say the presence of an isotope-producing cyclotron, combined with a radiochemistry “hot” lab at the university’s Saskatchewan Centre for Cyclotron Sciences (SCCS), was the critical factor in bringing them to Saskatoon.

“What makes SCCS a unique facility is that it gives researchers the opportunity to design and ultimately produce new drugs,” said Ghislain Boudreault, manager of the SCCS. “These outstanding researchers are leading teams to design new targeted ‘smart’ drugs for cancer, and in particular are at the forefront of addressing antibiotic-resistant bacterial infections, HIV and fungal infections.”

Recruited to the U of S chemistry department from the Memorial Sloan Kettering Cancer Center research hospital in New York City, Price was named Canada Research Chair in Radiochemistry in December. Meanwhile, the Russian-born and educated Dadachova spent 16 years researching the use of radioimmunotherapy in cancer and pathogen treatment at the Albert Einstein College of Medicine in New York. But lack of access to an isotope-producing cyclotron was a hindrance to expanding the research.

“I came here because there is a major concentration of facilities,” said Dadachova, Fedoruk Chair in Radiopharmacy and a professor in the College of Pharmacy and Nutrition. “I’ve never seen a place where you have in one location a research hospital, a veterinary hospital and a



U of S researchers Eric Price (left) and Ekaterina (Kate) Dadachova (right) chat with Canada’s Minister of Science Kirsty Duncan during a recent tour of the university’s cyclotron facility.

 DAVID STOBBE

cyclotron, plus a synchrotron.”

With researchers Chris Phenix and Humphrey Fonge already working at the SCCS, the university now has a unique critical mass of researchers in nuclear medicine, Boudreault said. He noted the cyclotron produces fluorodeoxyglucose—or FDG—a radioactive sugar molecule that is delivered five days a week to Royal University Hospital where it is injected into patients undergoing diagnostic imaging Positron Emission Tomography (PET) scans.

Because cancer cells have a higher metabolic rate than normal cells, they take up more of the radioisotope-containing glucose molecule. As a result, during radioactive imaging scans, the tumours glow in stark relief to the rest of the body. This provides a more accurate picture of how far a cancer has advanced compared with using X-rays or CT scans. Metabolic anomalies can be detected at a very early stage, which translates into earlier treatment and saving lives.

A similar approach can also be used to deliver a radioactive drug to cancer or infectious disease sites for treatment purposes, not just for detection of the disease. The key is to find a receptor within the tumour onto which the drug can attach itself.

“If you have a molecule that

will bind to that receptor, you can piggyback your radioactive isotope onto that,” Price explained. “Instead of having the patient undergo external beam radiation therapy, you can inject the radioisotope into the person and it’s going to go just to the tumour.”

A major area of Price’s research is to develop molecules that chemically tether new radioactive metals onto cancer-targeting proteins, so that they stay tightly attached.

“If the tether is not strong, the (isotopes) come free, and instead of going to the tumours, they go to the bones, the kidneys and cause damage,” he explained.

Dadachova is working with a drug company to continue work begun in New York on human trials of a new radioimmunotherapy for use in patients with metastatic melanoma. She hopes to get approval from Health Canada to continue this human trial with patients at RUH. She is also investigating how radioactive drugs injected into the body can target hard-to-combat pathogens, including fungal infections in immunosuppressed people and bacterial infections that have become resistant to multiple types of antibiotics.

“There are a lot of multi-drug resistant pathogens. Especially for those patients who are immunosuppressed, you can load them up with

antibiotics but nothing will help,” she said. “That’s why we need alternatives for antibiotics and antifungals.”

She sees possibilities for using Western College of Veterinary Medicine research facilities, in collaboration with veterinarian Dr. Elisabeth Snead, to test how promising radioimmunotherapy could destroy fungal infections in

companion dogs. This work, which would be a first, could lead to human trials in the future.

Her team in New York made medical news by using a radioimmunotherapy drug to target and destroy both latent and active samples of the HIV virus taken from patients, as well as killing HIV-infected cells behind the experimental human blood brain barrier. She said advancing this work to human trials is especially important because anti-viral drugs, which can suppress HIV for years, do not work in the brain—the place where the virus resides and causes inflammation of nerve tissues.

“A lot of HIV patients experience cognitive decline because the anti-viral drugs cannot cross into the brain. Patients end up in an Alzheimer’s-like state,” she said. “We have to find a way to penetrate the blood brain barrier and kill the infected cells there.” ■

Murray Lyons is a communications contributor with Research Profile and Impact at the U of S.



McKERCHER LLP

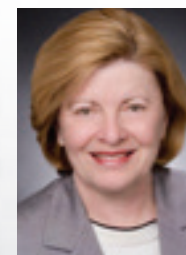
Lecture Series

at the College of Law

DESIGNING NEW COURT SYSTEMS IN FAMILY VIOLENCE CASES

Guest speakers:

Linda Neilson, University of New Brunswick
The Hon. Anne Dugas-Horsman,
New Brunswick Provincial Court



Mon., March 13, 2017

12pm (noon)

Room 150, College of Law
15 Campus Drive
University of Saskatchewan

This event is free and open to the public.
CPD Credit: 1 Hour



UNIVERSITY OF SASKATCHEWAN
College of Law
LAW.USASK.CA

Interested in governance of the University of Saskatchewan?

Consider offering to join a University Committee

Each year, the Nominations Committee of Council invites University of Saskatchewan faculty members, librarians and sessional lecturers to step forward and offer to serve on university committees. Our committees are the mechanism through which collegial university governance is achieved. Finding excellent people to serve on our committees is the job of the Nominations Committee. Our terms of reference direct us to find members who are broadly representative of the disciplines of the university. We select nominees for their experience, demonstrated commitment, and potential for a significant contribution to committee functions, and we strive for equity in representation.

Following are the committee vacancies which we are looking to fill for the 2017-18 academic year. We usually try to appoint people for three-year terms. Sessional lecturers are appointed for one year.

To volunteer or to nominate someone else:

- submit nominations online at:
usask.ca/secretariat/forms/index.php
by **Friday, March 17, 2017.**

For more information, please contact a member of the Nominations Committee of Council:

Nominations Committee of Council:		Phone
Tamara Larre	Law	1966
Nancy Gyurcsik	Kinesiology	1075
Jim Greer	Computer Science	2234
Donna Goodridge	Medicine	306-884-1009
Ryan Walker	Geography and Planning	5664
Angela Bowen	Nursing	8949
Fran Walley	Soil Science	6854
Ali Honaranooz	Veterinary Biomedical Sciences	7355
David Bindle	Library	6003

For more information, visit
usask.ca/secretariat/governing-bodies/council/committees.php or
call **306-966-2192**

Committee	What does it do?	How often?	Information about expected vacancies
University Council Committees			
Academic Programs Committee	Reviews and approves curricular changes from all colleges, recommends major curricular changes to Council, oversees policies relating to students and academic programs.	twice a month	Five vacancies + sessional
Governance Committee	Reviews Council bylaws and faculty council bylaws; responsible for academic misconduct and academic appeal regulations.	once a month	Three vacancies (must be a Council member)
International Activities Committee	Develops and reviews policies, programming, and strategic directions for international activities and programs.	once a month	Four vacancies
Nominations Committee	Nominates GAA and Council members for university committees and panels.	as required	Three vacancies (must be a Council member)
Planning & Priorities Committee	Reviews and advises Council and the university administration on planning, budgeting, and academic priorities.	twice a month	Four vacancies + sessional
Research, Scholarly & Artistic Work Committee	Reviews and advises Council on issues related to research, scholarly and artistic work, including research-related policies.	twice a month	One vacancy
Scholarships & Awards Committee	Grants awards, scholarships and bursaries open to students of more than one college or school; advises Council on scholarship and awards policies and issues.	as required	One vacancy
Teaching, Learning & Academic Resources Committee	Reviews and advises on pedagogical issues, Indigenous content, support services for teaching and learning and policy issues related to teaching, learning and academic resources.	once a month	Five vacancies + sessional
Collective Agreement Committees			
University Review Committee (URC)	Reviews college recommendations for awards of tenure, renewals of probation, and promotions to professor.	frequently November to March (evenings)	Three vacancies
Renewals and Tenure Appeal Committee	Hears appeals of URC decisions recommending against renewal of probationary period or award of tenure.	March	Three vacancies + one senior administrator
Promotions Appeal Panel	Members of the Promotion Appeal Committee, Sabbatical Committee, and President's Review Committee are selected from this roster.	variable in the spring	16 vacancies (must be full professor)
Other Committees			
Recreation and Athletics Advisory Council	Recommends on recreation and athletic fees charged to students and reviews reports on expenditures.	variable	One vacancy
Joint Committee on Chairs and Professorships	Reviews proposals to establish new chairs and submits to the Council and Board of Governors for approval.	variable	One vacancy (must be a Council member)

Newkirk sets sights on Paralympics

College of Education student juggles her time in the pool and school

✍ JAMES SHEWAGA

It hasn't taken long for Shelby Newkirk to make a splash on the national swimming scene.

The 20-year-old College of Education student has already set five Canadian records in para-swimming, in only her fifth year of competition. Her rapid rise has caught the attention of national team coaches, who selected her for the NextGen Camp Program, designed to develop the next crop of Canadian swimmers for the 2020 Paralympic Games in Tokyo.

"A lot of things are happening all of a sudden, so it's really exciting," said Newkirk, whose family (younger brother Cole, mother Kathy-Jo and father Rex, a professor in the University of Saskatchewan's College of Agriculture and Biore-sources) recently moved back home to Saskatoon from LaSalle, Man. "After putting in the work and time and then getting the reward, it really feels good.

"It's been a crazy year for sure. Moving back to Saskatchewan and changing schools, switching swim clubs and all of that kind of stuff, and then setting those Canadian records, it's definitely a good feeling. And now that I'm on the NextGen team for Tokyo 2020, it feels that much more realistic of a goal."

Newkirk, a member of the Saskatoon Lasers Swim Club, dived right into this season by setting Canadian para-swimming records in the 50-metre breaststroke, 100m breaststroke, 200m breaststroke, 50m backstroke and the 100m backstroke, which is her best Paralympic event.

The next stop on the road to Tokyo for Newkirk is at the Copenhagen Para-Swimming World Series in Denmark, where she is currently competing to secure international classification for the national



Shelby Newkirk has set five Canadian para-swimming records.

PHOTO SUBMITTED

team trials that begin March 30 in Windsor, Ont. A strong showing there will earn her a trip to the world championships that start Sept. 30 in Mexico City, one step away from the Paralympics in 2020.

"When I started swimming five years ago, I never thought that I would be at this point where I would be making goals for being in the Paralympics," said Newkirk. "But my first coach sat down with me once and said, 'It's not if you are going to make the Paralympics, it's when.' So that's when we started focusing on goals to work up to that. And being able to represent Canada on the biggest stage would be so cool."

Plenty of work lies ahead for Newkirk, who balances swimming and studies, training five or six days a week while also taking a full course load in her first year of education. Simply getting around campus is also a challenge for Newkirk, who has no feeling in her right leg and has symptoms spreading throughout her body, after being diagnosed with early-onset generalized dystonia when she was 13.

"I use crutches most of the

time, if I am just going somewhere fast for a couple of seconds. But if it's anything longer, I use my wheelchair, so at school I always use my

“ I have always known that I wanted to help get kids more involved, especially kids with disabilities.

Shelby Newkirk

chair," she said. "It's difficult, just because you do have to change some things and not everything is accessible ... but there are so many people (on campus) who are willing to help and advocate on your behalf to get you to where you need to go, so that's awesome."

Newkirk has quickly become a role model for young para-swimmers and is passionate about working with children with disabilities. As a teacher, she wants to help make the classroom, the gymnasium

and the pool more inclusive and accessible.

"I have always known that I wanted to help get kids more involved, especially kids with disabilities," said Newkirk, who earned a two-year diploma in disability and community support at Winnipeg's Red River College in 2016 before transferring to U of S.

"I kind of relate to kids that way and I think whatever I can do to make somebody else's time at school easier, then I want to try and do that. So I am going into education with the mindset of inclusive classrooms and getting all kids involved, no matter what their abilities."

For her part, Newkirk's abilities are helping her represent her country on the international stage, with the Paralympics in Tokyo only three years away. ■

ARE YOU THE NEXT STUDENT IRON CHEF?

Everyone Welcome!

where: Marquis Culinary Centre
when: March 22, 2017 5:45 pm
price: \$12.45 (Residents with meal plans - FREE)

www.usask.ca/culinaryservices for more info

Culinary Services logo and Student Iron Chef 2017 logo are also visible.



COMING EVENTS

Conferences

Health Innovation and Public Policy Conference – Beyond the Bedside

March 15, 12:30–5 pm, room E1150, Health Sciences Building. Join us for the annual multidisciplinary student-run conference that attracts around 500 attendees and high-profile speakers. The conference is free to attend, open to anyone and includes lunch. Attendees can register by March 10 at picatic.com/HIPP2017.

SEMINARS / LECTURES

Department of Psychology's monthly colloquium series

March 16, 3–4 pm, Arts 153. Kyle Brymer, Department of Psychology, will give a talk entitled *Novel Antidepressants in Preclinical Animal Models of Depression*. This talk will focus on research that utilizes preclinical animal models to examine novel antidepressants in the hopes of finding more efficacious, and faster-acting, antidepressants. For more information, please contact Peter Grant at 306-966-6675 or via e-mail: peter.grant@usask.ca.

School of Public Health – Vaccinology and Immunotherapeutics special seminars

- March 16, 12:30 pm, InterVac boardroom, 120 Veterinary Road. Azita
- Haddadi presents: *Nanomedicine for cancer chemo/immunotherapy*.
- March 30, 12:30 pm, InterVac boardroom, 120 Veterinary Road. Dr. Philip
- Griebel presents: *Oral vaccines targeting potential microbiome pathogens*.

Greenhouse Gas Emissions Reductions in Canada through Electrification of Energy Services

March 21, 10:30 am–noon, Prairie Room, Diefenbaker Centre. Featuring Allan Fogwill, president and CEO, Canadian Energy Research Institute. Canada is to undertake efforts to reduce greenhouse gas emissions by 30 percent below 2005 levels by 2030. This study assesses energy systems and the environmental and economic implications of transforming energy end-use conversion technology mix into one dominated by electricity in the residential, commercial and passenger road transportation sectors of the 10 Canadian provinces. For more information, visit schoolofpublicpolicy.sk.ca.

2017 Tansley Lecture – Canada and President Trump: How do we manage?

April 5, 5–9 pm, Evraz Place, Regina. Join Colin Robertson as he explores the uncertain and critical era into which Canada–U.S. relations are entering. A former Canadian diplomat, Robertson is a senior advisor to Dentons LLP in Ottawa and working with the Business Council of Canada. He is vice-president and fellow at the Canadian Global

Affairs Institute. Robertson writes a column every two weeks on foreign affairs for *The Globe and Mail* and is a regular contributor to other media. For more information and to register, visit schoolofpublicpolicy.sk.ca.

COURSES / WORKSHOPS

Edwards School of Business Executive Education

For information call 306-966-8686, email execed@edwards.usask.ca or visit edwards.usask.ca/execed.

- March 16, Engagement Series – Part 3: Tapping Passion – Moving Beyond Mid-Life Malaise – Saskatoon
- April 3–7, Certified Coach Training – Saskatoon
- April 4–6, The Project Management Course – Saskatoon
- April 10–12, Finance for the Non-Financial Manager – Regina
- April 11, Managing Difficult Conversations – Saskatoon
- April 17–18, Operational Excellence Certificate: Master Clinic on Solving Tough Problems – Saskatoon
- April 20–21, Operational Excellence Certificate: Process Metrics, Management and Controls – Saskatoon
- April 25–May 23, The Leadership Development Program – Saskatoon
- April 26–28, Digital and Social Media Program: Metrics, Measurement and Analytics – Saskatoon
- May 18, Edwards School of Business Leadership Conference: Evidence-Based Decision Making – Saskatoon
- May 26–June 2, Effective Executive – Waskesiu

ESL evening classes at the Language Centre

April–May (spring term) and July–August (summer term). Classes include advanced writing and speaking, graduate-level writing, pronunciation. For more information, to register or book a placement test, please contact 306-966-4351 or visit ptes.usask.ca.

THE ARTS

Sisters United: An exhibit on women's suffrage in Saskatchewan

Daily until March 14, 9 am–8 pm, Diefenbaker Centre. Sisters United commemorates the centennial of women winning the right to vote in 1916. Explore compelling stories of suffragist leaders who laid the foundation for women's rights in Saskatchewan.

Greystone Theatre presents: *Cabaret*

March 22–April 1 (no show on March 26), 8–10 pm, John Mitchell Building. This Kander and Ebb musical is based on *The Berlin Stories* by Christopher Isherwood. Set against the low simmer of the burgeoning

Nazi movement in Berlin of 1929, patrons and performers of the burlesque Kit Kat Klub thrive through decadence and denial. As witnessed through the perspective of a young American expat, their stories unravel in this Tony award-winning classic. Admission: \$22, seniors \$19, students \$17. Available online at artsandscience.usask.ca/drama/greystone/tickets.php or by visiting the daytime box office in John Mitchell Building, room 183. Hours of operation are 10 am–12 and 1–4 pm.

MISCELLANY

Child Health Research Trainee Day

March 23, 11 am–2:30 pm, GSA Commons, Emmanuel and St. Chad. Undergraduate and graduate students and residents from any discipline who are engaged in child health related research are invited to present. For more information and to obtain the abstract submission form, contact erin.loose@usask.ca or visit medicine.usask.ca/department/clinical/pediatrics.php.

Volunteering—it's in Saskatchewan's DNA!

Join us for the inaugural volunteer summit on March 25 as part of the University of Saskatchewan's Alumni Association Centennial. This event welcomes all managers of volunteer resources, volunteers and board members, organizational leaders and future leaders. For more information and to register, visit alumni.usask.ca/volunteersummit.

Volunteer Summit Symposium

March 25, 8 am–4 pm, Health Sciences building. You'll have the opportunity to:

- Connect with other volunteers, volunteer managers, community leaders and content experts;
- Learn about current research, important trends and how we can build our skills and knowledge;
- Learn how to effectively inspire others to do great things; and
- Keep volunteerism thriving in Saskatchewan.

Volunteer Summit Gala

March 25, 6–10 pm, TCU Place. The celebrations continue into the evening featuring a keynote address from Bruce MacDonald, president and CEO of Imagine Canada. In addition, we will celebrate your volunteer stories, present a new volunteer award and invite you to join a national Canada 150 challenge to volunteerism.

Call for orators

The convocation office is looking for volunteer orators to read out the names of degree recipients at spring and fall convocation. We are looking for faculty and staff from across campus with resonant voices and fine pronunciation skills. If you are interested in participating, please email your resume to bobbi.mumm@usask.ca by March 20, 2017. Auditions will be held in early April.

Images of Research Photo-Imaging & Making a Difference Video Pitch Competitions

What does research look like to you? Enter the third annual U of S Images of Research photography and imaging competition. Grand prize: \$500. New for Canada's 150th: How is your research Making a Difference to Canada? Tell us

in a one-minute video pitch. Two \$300 prizes. Submit before March 17, vote March 18–April 1. For more information: <http://research.usask.ca/images-of-research.php>

Wellness events

For more information, contact wellnessresources@usask.ca or call 306-966-4580. These events are free for all U of S employees.

- March 16, 2:30–3:30 pm, Physics 128, Resiliency: Bouncing Back After a Setback. This workshop will examine the characteristics of resilience and discover ways to introduce greater resilience into our lives. To register visit resiliencyusask.eventbrite.ca.
- March 30, 1:30–2:30 pm, Admin C280, Mindfulness: Being Present in Your Work and Life. This workshop discusses mindfulness and how to incorporate its practice into your life. To register, visit mindfulnessusask.eventbrite.ca.
- April 11, 1–2 pm, Admin C280, Communication Skills for Families.

This workshop will improve your communication skills and supply tips for conflict resolution. To register visit familycommunicationusask.eventbrite.ca.

Sunday mass at STM Chapel

Each Sunday until Oct. 22, 11 am–noon, join the campus ministry team for the celebration of the Eucharist! Come worship God in a welcoming environment with people from the campus community. For more information, visit stmcollege.ca.

**Next OCN: Friday, April 14
Deadline: Monday, April 3**

U of S to celebrate volunteers

This month's inaugural University of Saskatchewan Volunteer Summit will bring together volunteers, board members, community leaders, employers and students from across the province.

The Volunteer Summit, scheduled for Saturday, March 25, will celebrate the accomplishments of volunteers throughout Saskatchewan and will also equip attendees with the knowledge and skills to keep volunteerism thriving province-wide.

"The slogan for the Volunteer Summit is 'Volunteering—it's

in Saskatchewan's DNA,'" said Christine Epp, alumni and community relations volunteer engagement specialist at the U of S. "People throughout the province have generously given their time, talent and treasure. The Volunteer Summit will be a fun opportunity to recognize these contributions and ensure Saskatchewan remains a leader in volunteerism."

The day-long event, hosted by the U of S Alumni Association Centennial, is divided into two parts; a symposium during the day

at the Health Sciences Building and an evening gala at TCU Place.

The symposium includes workshops and panels led by national volunteerism experts, covering topics including recruiting, inspiring millennials, and uncovering research and trends in volunteerism.

The gala includes a cocktail reception and dinner, the presentation of the Volunteer BUZ Award, a keynote address from Bruce MacDonald, president and CEO of Imagine Canada, and a Canada 150 for 150 volunteer challenge. ■

For more details, including a complete event schedule, speaker bios and registration links, visit: alumni.usask.ca/volunteersummit

Swedish exchange opportunity an eye opener for Ruff

HENRYTYE GLAZEBROOK

Sitting down for class in Lundholm, Sweden, Nathan Ruff was stunned to see what a country can accomplish when it makes renewable energy resources a priority.

Ruff travelled to the Scandinavian country as a part of a student exchange program offered by the University of Saskatchewan. The experience opened his eyes to the potential of alternative energy.

“Coming from somewhere like Saskatchewan, renewables aren’t

viewed the same way,” Ruff said. “They’re seen as if the technology isn’t there yet or they’re too expensive and we can’t afford them. It’s exciting to go to another part of the world and see so much of their electricity coming from wind when here we just can’t muster it. It makes you wonder what mechanisms might be in place that make this seem like such a more viable option for somewhere like that.”

Ruff is an undergraduate student



Ruff

in the resource economics and policy program offered through the College of Agriculture and Bioresources. Ruff said he first started exploring his

choice of study because he had begun developing a grim outlook toward the study of general economics he had previously been enrolled in.

“I did some searching around and I discovered this program, which incorporates my interest in economics but also my interest in natural sciences and the resource sector,” said Ruff. “It was a bit of an ‘Aha!’ moment when I read about the program.”

He spent the summer of 2016

working with AgBio Discovery, a program aimed at introducing children to opportunities offered through agriculture.

If he’s being honest, Ruff didn’t initially get involved in agriculture to make Earth a better place. These days, though, that goal has become one of the driving forces behind his academic career.

“We have to become more green and environmentally sound and be stewards for the environment.” ■

Researchers improving cancer diagnosis

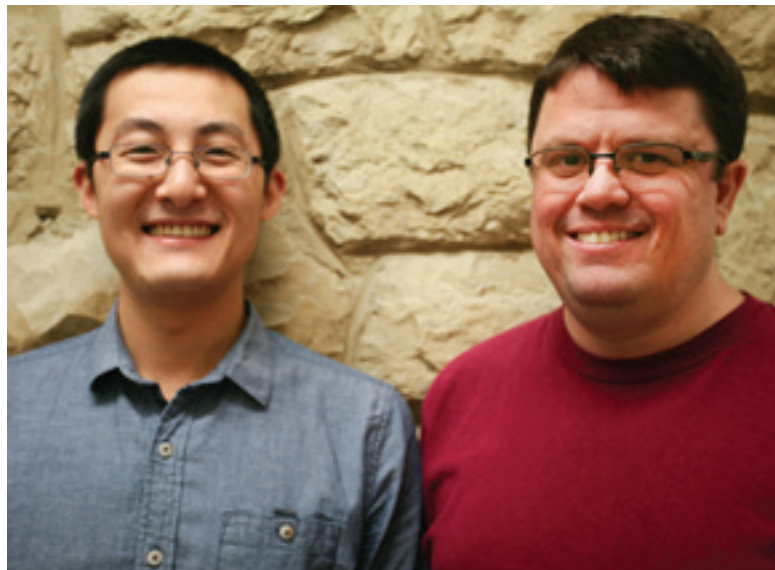
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But Eramian explained that it’s not only the accuracy that’s important, but also the sensitivity.

“When you’re doing computer-assisted diagnosis of cancer, there are two ways to be wrong: you can say it’s malignant when it’s actually benign, or you can say it’s benign when it’s actually malignant,” Eramian explained. “The sensitivity is what percentage of the malignant cases were correctly labelled as malignant, and the specificity is what percentage of benign cases were correctly labelled as benign.”

“Those two kinds of errors have very different costs: it is disastrous to conclude that a nodule is benign when it’s actually malignant, but the worst consequence of a benign module being labelled malignant is a biopsy that comes back negative. We can tune the classifier so that sensitivity is preferred over specificity. We might, for example obtain near-perfect sensitivity, successfully detecting malignant nodules, at the cost of labelling a small percentage of benign cases as malignant. Then we’re doing biopsies in those few benign cases, but probably still fewer than what we’re doing now.”

It’s not just a matter of Eramian’s team uploading images into the network, however. Since the images



Mark Eramian (right) and research assistant Jianning Chi.

SUBMITTED

have been sourced from hospitals and health systems from across the country, they arrive with varying imaging standards. Jianning Chi, a research assistant in computer science, has to manually match the scales (the pixels per centimetre) and image quality before they can be used.

“We have to adjust the images to make sure they have the same scale, according to the network specifications,” Chi said. “I first detect the ticks (the measurement scale each ultrasound uses) on the images, and then resize the images so they have the same scale. I then locate the markers made by radiologists, which

show the regions of interest, before removing them from the image and filling in the gaps with approximations based on neighbouring textures, which ensures that the samples are noise-free.

“So I’ve been repurposing the samples to train the deep-learning network to improve its performance.”

The team expects to publish its research later this spring, which Babyn hopes will be followed by using the technology in clinical trials. ■

Marg Sheridan is an online communications co-ordinator in the College of Medicine.

STM Faculty Book Launch & Reception



WEDNESDAY, MARCH 15, 2017

ST. THOMAS MORE COLLEGE ATRIUM 3PM RECEPTION TO FOLLOW

DR. MARY ANN BEAVIS

- *Hebrews*
- *1-2 Thessalonians*
- *Christian Goddess Spirituality: Enchanting Christianity*

DR. BOHDAN KORDAN

- *No Free Man: The Great War, Canada and the Enemy Alien Experience*

DR. NATALIA KHANENKO-FRIESEN

- *Ukrainian Otherlands: Diaspora, Homeland, and Folk Imagination in the Twentieth Century*
- *Reclaiming the Personal: Oral History in Post-Socialist Europe*

DR. CYNTHIA WALLACE

- *Of Women Borne: A Literary Ethics of Suffering*

DR. DAVID McGRANE

- *Remaining Loyal: Social Democracy in Quebec and Saskatchewan*

DR. CHARLES SMITH

- *Unions in Court: Organized Labour and the Charter of Rights and Freedoms*

DR. SAEED MOSHIRI

- *Strategies for Sustainable Energy for Iran*

DR. MONICA HWANG

- *Social Inequality in Canada: Dimensions of Disadvantage*

Celebrating
St. Thomas More College faculty



ST. THOMAS MORE COLLEGE
UNIVERSITY OF SASKATCHEWAN

stmcollege.ca



There are fascinating statues, artifacts and fun objects located all over the University of Saskatchewan campus. Get to know them a little better with this year's *On Campus News* back page feature: Interviews with inanimate objects. If you know an inanimate object, tell us about it at news@usask.ca.



Arts piano

LOCATION: FIRST FLOOR, ARTS BUILDING



■ **Tell us more about yourself.**

For a very long time, I had a home in the Department of Music, but then I was badly vandalized. I was rebuilt by piano technician Roger Jolly and was moved to the Green Room in the Administration Building, serving as a warm-up piano for performers in nearby Convocation Hall.

When he was dean of Arts and Science, Peter Stoicheff enquired about having a piano in a public space, and I moved here shortly thereafter in spring of 2014. Since then, I've become pretty popular—so much that I recently had to have a new bench purchased as my last one was worn out!

■ **What kind of piano are you?**

I am a Heintzman baby grand piano.

■ **What do you like about being in the Arts Building?**

I feel like I've become part of the building's culture and identity since moving here. And providing a classical soundtrack to someone's day is really neat, too. Sometimes students bring in violins, guitars, banjos and harmonicas to accompany me, which can be very fun.

■ **Who is your favourite pianist?**

I have a soft spot for Beethoven and Chopin.

■ **Are you ticklish?**

Only my keys.

Information provided by
Chris Putnam and Andrea Wasylow-Ducasse, College of Arts and Science.