

GREEN & WHITE

UNIVERSITY OF SASKATCHEWAN ■ ALUMNI MAGAZINE

SPRING 2014

**WHAT IS THE CANADIAN
LIGHT SOURCE
SYNCHROTRON AND
HOW DOES IT WORK?**

**EXCELLING AT
ACCELERATOR SCIENCE:
A BRIEF HISTORY**

**CAN THE CLS ADDRESS A
LOOMING SHORTAGE OF
MEDICAL ISOTOPES?**

**CLS RESEARCH THAT
COULD CHANGE
YOUR LIFE**

**2013 REPORT
TO DONORS
AND
READER
SURVEY
INSIDE**

ON THE COVER

Equipment on the REIXS beamline designed to understand physical phenomena on the surface of materials.

 COVER AND CONTENTS: DAVID STOBBE

A University of Saskatchewan publication

Editor

Derrick Kunz, BComm'96

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The fall 2013 issue of the *Green & White* won a Council for the Advancement and Support of Education (CASE) award.



District VIII

2014 Communications Award Winner

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Hello alumni and friends

The U of S is the only Canadian university with two national science laboratories on its campus: the Canadian Light Source (CLS) and VIDO-InterVac. This was one of the reasons I was aware of the university's reputation well before becoming its president.

These national facilities came to be through collaboration and the work of many partners. The fact they are both located on our campus makes sense, because at the U of S we excel at large, complex and collaborative projects.

It has been 10 years since the opening of the synchrotron, and this issue of the *Green & White* marks that anniversary. These pages will not only explain what the only synchrotron in Canada does, but also shed some light on the type of research that takes place in a facility the size of a football field.

From a historical perspective—with well over half a century of leadership and expertise in diverse areas of physics and molecular research—our campus was a natural home for the CLS. Our history includes the establishment of a spectroscopy laboratory by Nobel laureate Gerhard Herzberg, Canada's first betatron high-energy accelerator, the medical breakthrough of cobalt-60 cancer treatment and construction of the linear accelerator. All of this happened on our campus (see page 20 for more history).

Certainly this foundation of facilities and expertise made the U of S the perfect landing spot for Canada's synchrotron, and 10 years later, synchrotron science is now one of the university's signature areas and a field in which we are recognized as a global leader.

Researchers, through the CLS, can examine chemical and structural material at the molecular level—it is a powerful imaging and analytical tool that can be used to solve pressing issues related to health, the environment, materials science



and other areas of global, social and economic significance.

With the broad range of academic fields and the nature of our signature areas, the CLS is widely used by those at the U of S and also draws researchers from around the world, giving our synchrotron scientists the opportunity to literally be a part of solving global challenges. In fact, U of S expertise and experience has been sought out in the development of a synchrotron in the Middle East.

We are fortunate to have this unique facility on our campus because it enables our research to strengthen Saskatchewan, Canada and the world. This issue of the *Green & White* will share some of the stories from the past 10 years and show a glimpse of the possibilities around the corner. ■

Ilene Busch-Vishniac

Ilene Busch-Vishniac
President, University of Saskatchewan
uofs.president@usask.ca

Seeking global solutions through U of S research

 KAREN CHAD (BSPE'80, BED'81)

Karen is the vice-president of research at the U of S. In 2013, she was listed on the Women's Executive Network's Canada's Most Powerful Women: Top 100.

One in eight people in the world is chronically undernourished. More than 780 million people do not have access to safe drinking water. New emerging infectious diseases are on the rise, and 20 diseases are now drug-resistant.

These are daunting and complex challenges, and one thing is certain—research will be part of the solution. We have a responsibility as a leading Canadian research university to help address the big challenges like these faced by our fast-growing province, our nation and our world.

We are well positioned to make a difference both regionally and globally in our six signature areas of research strength: food security; water security; Aboriginal Peoples scholarship; sustainable energy; integrated animal, human and ecosystem health (one health); and synchrotron sciences.

Success in finding solutions to global challenges involves recognizing four imperatives in today's changing research environment.

The first is that these global challenges are too big for any one government, industry or university to solve. Research partnerships with governments, companies and communities are critical to ensuring that discoveries and insights meet community needs and are translated into new products and policies with impact.

For instance, to help feed a hungry world and better serve Saskatchewan needs, we have partnered with PotashCorp, the Saskatchewan government, and most recently, Viterra on the Global Institute for Food Security which brings together top scientific talent from Canada and abroad to focus on issues of local and global importance.

Secondly, teams tackling multi-dimensional problems must be multi-disciplinary, spanning the spectrum from humanities and social sciences, to health and science disciplines, to policy research.

Thirdly, finding solutions requires the best and brightest minds. Competition for research talent has become immense as more countries are realizing the huge economic and social benefits of research. We are succeeding in attracting some top faculty and students, many of whom are drawn to our campus by the presence of our world-class research facilities such as the Canadian Light Source synchrotron and VIDO-InterVac.

For example, Ingrid Pickering and Graham George—both Canada Research Chairs—were recruited from Stanford University by the prospect of using our synchrotron in their work, including projects related to both food and water security issues such as combatting effects of arsenic in Bangladesh drinking water (see page 14).

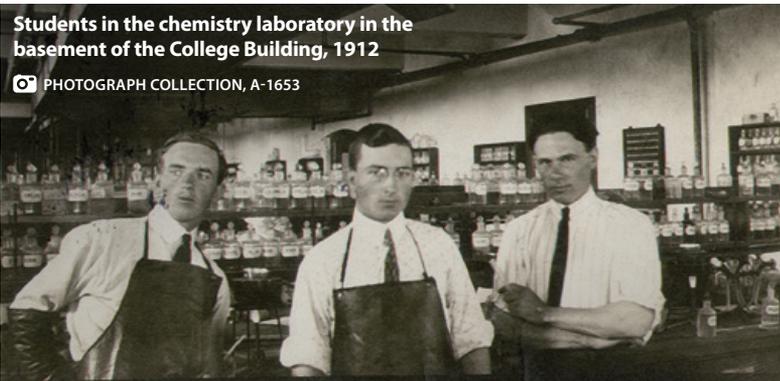
A chance to lead a world-class water research team with international and multidisciplinary

collaborators and access to the synchrotron was a key factor in recruiting renowned hydrologist Howard Wheatler from the UK to launch our Global Institute for Water Security. His team of more than 70 researchers and 50 graduate students and post-doctoral fellows includes Canada Research Chair John Giesy, recruited from Michigan and now the world's most cited author in ecology and environmental sciences.

Lastly, we need to train the next generation of researchers and private sector leaders so they are well prepared to contribute in a knowledge-based and swiftly changing global economy. Besides attracting more top graduate students, we have launched a new program to ensure that the majority of undergraduates have research opportunities including internships, one-on-one mentoring and co-operative work placements.

To achieve our ambitious goals, we have joined the U15, an alliance of Canada's top research universities and a research powerhouse with more than \$5 billion invested annually. In March, the U15 universities joined the pre-eminent global network of leading research universities from America, Europe, Asia and Australia to unite around common goals and address challenges facing research-intensive universities around the world.

Alumni can be proud that the University of Saskatchewan now “runs with the best” as we seek to generate new ideas and life-changing policies and innovations that will improve lives in Canada and around the world. ■



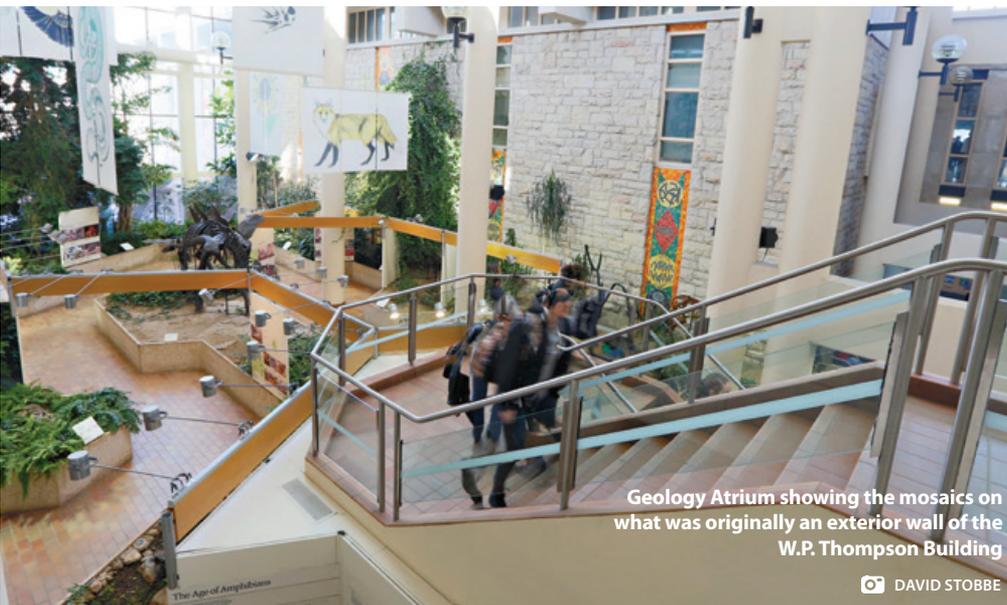
Students in the chemistry laboratory in the basement of the College Building, 1912

PHOTOGRAPH COLLECTION, A-1653



Thompson (middle) and family at the official opening of the building

COURTESY OF THE THOMPSON FAMILY



Geology Atrium showing the mosaics on what was originally an exterior wall of the W.P. Thompson Building

DAVID STOBBE



Nobel laureate Henry Taube

A century of science

TIM HUTCHINSON

Department of Chemistry

This past fall, the Department of Chemistry celebrated a century of graduates. It was also the 30th anniversary of the Nobel Prize awarded in 1983 to the department's most celebrated graduate, Henry Taube (BSc'35, MSc'37). Taube is the only U of S alumnus to have received a Nobel Prize, and one of only two Nobel laureates (the other is Gerhard Herzberg, a former faculty member) from the U of S.

After receiving his PhD in 1940 from the University of California Berkeley, Taube was unable to obtain an academic position in Canada, and ultimately spent his entire career in the United States. His Nobel citation (Henry Taube fonds) recognizes him as "one of the most creative contemporary workers in inorganic chemistry."

The lecture theatre known informally as the airplane room has been officially named the Henry Taube Lecture Theatre.

Department of Biology

This year marks the beginning of the second century of the Department of Biology. Its first professor and head, W.P. Thompson, later served as dean of the College of Arts and Science, and in 1949 was named the university's third president. He was the architect of the four-year honours program and supported initiatives in creating new departments, adding (among others) drama (1944), psychology (1947), and sociology (1957). The College of Medicine was also established during his tenure.

The Biology Building was official opened in 1960, and named in W.P. Thompson's honour. Perhaps the most striking of the building's features

is the mural of mosaic tiles that adorns the south and west exterior walls. The mural depicts the four main stages of cellular mitosis. The artist, Roy Kiyooka, chose chromosome patterns as a testament to Thompson's important discoveries regarding the genetics of wheat rust. In 1986, the Geology Building was completed on the south side of biology, resulting in the transformation of the south facade from an exterior into an interior wall, part of a new atrium.

Richard Rempel (BA'58) recently published *Research and Reform: W.P. Thompson at the University of Saskatchewan*, making extensive use of the collections of University Archives and Special Collections in researching this biography. He has donated additional material gathered in the course of his research. ■

2014 G&W Reader Survey

The *Green & White* is your alumni magazine, so tell us how we are doing. The following survey should take you about 5 minutes to complete, and you can enter to win an iPad.

You can complete the survey online at alumni.usask.ca/GWsurvey or mail this page to:

Green & White Reader Survey
501 – 121 Research Drive
Saskatoon SK S7N 1K2

Participation is voluntary and responses are confidential. For details about how we protect your privacy, visit usask.ca/privacy.

The *Green & White* is currently produced two times per year, in the spring and fall, and is available in print or digital online editions.

1. How often do you read the *Green & White*?

- Every issue
- One issue per year
- Never read an issue

2. What best describes your opinion on the publication frequency of the *Green & White*?

- I would like to receive it more often
- I think it is just right
- I would like to receive it less often

3. How much of each issue of the *Green & White* do you typically read?

- All of it
- Most of it (more than half)
- Some of it (less than half)
- None of it

4. What sections of the magazine do you read? (circle one for each section)

President's Message	Always	Often	Sometimes	Never	Unaware of this section
Remember When	Always	Often	Sometimes	Never	Unaware of this section
Opinion	Always	Often	Sometimes	Never	Unaware of this section
On Campus	Always	Often	Sometimes	Never	Unaware of this section
Student Spotlight	Always	Often	Sometimes	Never	Unaware of this section
Faculty Focus	Always	Often	Sometimes	Never	Unaware of this section
Features	Always	Often	Sometimes	Never	Unaware of this section
Alumnews	Always	Often	Sometimes	Never	Unaware of this section
Alumni Profiles	Always	Often	Sometimes	Never	Unaware of this section
Class Notes	Always	Often	Sometimes	Never	Unaware of this section
In Memoriam	Always	Often	Sometimes	Never	Unaware of this section

5. I prefer to read the *Green & White*...

- In print
- Online (includes tablets and mobile devices)
- Both in print and online
- I don't read the *Green & White*

6. How likely are you to go online to... (circle one for each section)

read the magazine instead of the print version	Very unlikely	Not likely	Unsure	Likely	Very likely
watch a video related to an article	Very unlikely	Not likely	Unsure	Likely	Very likely
read an extended version of the print story	Very unlikely	Not likely	Unsure	Likely	Very likely
view a photo gallery related to an article	Very unlikely	Not likely	Unsure	Likely	Very likely
read news or stories not in the print version	Very unlikely	Not likely	Unsure	Likely	Very likely

7. Why do you read the *Green & White*? (check all that apply)

- To advise me of alumni events
- For general interest stories about alumni
- To stay informed about friends and classmates
- For useful career and networking information
- For current U of S news and events
- To learn more about U of S research
- For volunteer opportunities with the U of S and the U of S Alumni Association
- To reminisce about my time on campus
- Other (please specify): _____

8. The *Green & White* makes me feel more connected to the U of S.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

9. What actions have you taken as a result of reading the *Green & White*? (check all that apply)

- Attended an event
- Volunteered for an activity
- Made a donation to the university
- Contacted a classmate or friend
- Furthered my studies at the U of S
- Recommended the U of S to a potential student or family member
- Submitted a class note
- Discussed or forwarded an article or issue
- Visited the magazine's or university's website
- Inquired about a product or service from an advertiser
- No action
- Other (specify)

10. Are there any changes or improvements to the *Green & White* you would like to suggest?

11. How would you describe your relationship to the University of Saskatchewan? (check all that apply)

- Alumnus/alumna (graduate)
- Attended U of S (non-graduate)
- Current student
- U of S faculty
- Retired U of S faculty
- U of S staff
- Retired U of S staff
- Donor
- Volunteer
- Parent or relative
- Other (please specify): _____

13. Please indicate your gender. Male Female Other

14. In which of the following age categories do you belong?

- Under 26
- 26 to 35
- 36 to 45
- 46 to 55
- 56 to 65
- Over 65

15. Please indicate your country and province/state of residence.

To be entered to win the iPad, you need to provide your name, email address and phone number.

Name

Email address

Phone

Skill testing question: Who is the U of S alumnus who won the 1983 Nobel Prize in Chemistry?

We may be conducting some follow-up research to get more insight on responses to the survey. Are you willing to participate in additional research?

- Yes
- No

Survey responses are kept confidential. All survey responses received on or before June 30, 2014, will be eligible to win.

By providing your name and contact information, the winner agrees to allow the University of Saskatchewan to publish his/her name for publicity purposes.

Note: Specific request such as updating contact information or changing contact preferences will not be completed using this information. For these requests, visit alumni.usask.ca for contact details.



* Prize may not be exactly as shown



ADRIAN HUNT, BE'03, MSc'07

Studying the world's thinnest material

✍ THOMAS UNION

Scientists around the world are showing enormous interest in a very tiny material—graphene, the world's first 2D crystal.

The material was first created less than a decade ago by making the mineral graphite as thin as physically possible: one atom thick.

Graphene is flexible like rubber, and despite being so thin, is a better conductor than copper and 100 times stronger than steel—special properties that could make graphene ideal for use in everything from artificial muscles to futuristic foldable computer display screens.

“Graphene is arguably one of the most promising materials in materials science today,” said U of S professor and Canada Research Chair Alexander Moewes.

To use graphene for the technologies of the future, scientists need a more complete understanding of the material. Using the synchrotron at the U of S, physics PhD student Adrian Hunt (BE'03, MSc'07) has revealed a number of graphene's previously unknown properties, focusing on graphene's potential to improve solar energy cells.

“I am driven by one goal alone: cheap and clean energy for all,” said the father of three who returned to the university after three years working in industry.

“We need to come up with ways to supply energy that allow people to live the advanced lifestyle they have, but also doesn't destroy the planet or harm the economy.”

Graphene-based solar cells would be both cheaper and more versatile than today's large solar panels. Acting like a “solar skin” on top of a house, car or electronic device, the graphene-based cell could mould directly to the shape of whatever it powers.

These solar cells could be made with a form of the material called graphene oxide. The added oxygen atoms allow graphene to absorb light much more effectively. However, they also cause the material to break after a short time.

Hunt used the synchrotron to explain precisely what happens on the molecular level to cause that breakage. He then found a way to prepare graphene oxide that prevents the breaking process from happening.

“The synchrotron allows me to see where the electrons are in respect to one another and how they interact,” he said.

Hunt examines how synchrotron light interacts with materials. Each atom and each atomic bond interact with light differently. When the frequency is just right, the atom resonates, allowing him to identify a material's molecular structure, just as a musician with perfect pitch recognizes a G note when the proper guitar string is played.

Hunt and his supervisor, Moewes, collaborated on a publication of this research, which earned a nomination for the ENI, an Italian award billed by journalists as the Nobel Prize of green energy.

Scientists are excited about the possibility of using cheap, organic materials such as graphene to replace the expensive, toxic metals used in today's solar panels.

“Currently, organic solar cells are uncommon in the marketplace because they only last half as long,” said Hunt.

Research like Hunt's is crucial to making the material a viable option for solar energy. ■



Back (l-r) Robert Blyth (CLS), Kalley Woodward, Beverly Janvier (teacher), Jeffery Klyne, Adrain Lemaigre, Bryan Chappell (teacher); front (l-r): Faden Janvier, Liam Gibbons, Tracy Walker (CLS)

Northern Lights

ANDRÉA LEDDING

While it can be a challenge to engage high school students in math and sciences, it can often be an added challenge to make the subjects relevant to students in remote northern communities.

Bryan Chappell, a senior science teacher at La Loche Community School in the Northern Lights School Division, has seen a dramatic increase in student engagement over the past few years thanks to Students on the Beamlines—a Canadian Light Source (CLS) outreach program that allows students to participate in hands-on experiments at a state-of-the-art facility with world-class scientists.

Members of the La Loche Community School, including Chappell, were touring the U of S campus in 2010, when questions from another visiting school about soil acidity in northern forests sparked their curiosity.

Students not only had the opportunity to go out into their natural environment to collect soil, water, lichen and tree samples for further analysis, they got to visit and utilize the CLS where the samples were studied at the atomic level under

the synchrotron's powerful light. Carrying out the experiments and presenting results to scientists was an engaging and empowering experience of active enquiry, far more so than working through a textbook in a classroom. Exposing impressionable young students to relevant and practical applications of the facility and having access to CLS staff are priorities for Students on the Beamlines, hopefully inspiring the next generation of scientists.

Tracy Walker (BE'd'91, ME'd'12) is the educational outreach officer at the CLS and coordinates student projects with high schools across Canada. Walker explained that submissions are based on whatever science experiments and topics the students are interested in; the students are then matched with scientists based on the project's focus. Walker noted that while traditional classroom science experiments are almost set up like a predictable cookbook recipe, here the learning is more student-driven. Students not only help create the focus of the experiment, but are also encouraged to ask questions which may lead to more questions before definitive answers are found. When the results are in, Walker

explained, the students must then make sense of the outcomes and plan further experiments based on the new discoveries if necessary.

"It's learning by doing," Walker said. "And it's the way scientists actually work."

Chappell said the program has been a major success for La Loche science students, with tangible results. The students make thoughtful contributions to problems and solutions, rather than being told what to learn. Grades have improved with interest, and the science program is thriving. Rather than learning about the process or definition of scientific postulation and theory, they are carrying out these processes themselves within their own community on issues that matter to them.

"They planned experiments and carried them out, did presentations and have returned each year. We have become regulars at the synchrotron, and there is a much stronger interest now in pursuing science," he noted. "They become much more studious, ask deeper questions, and it has really helped a lot."

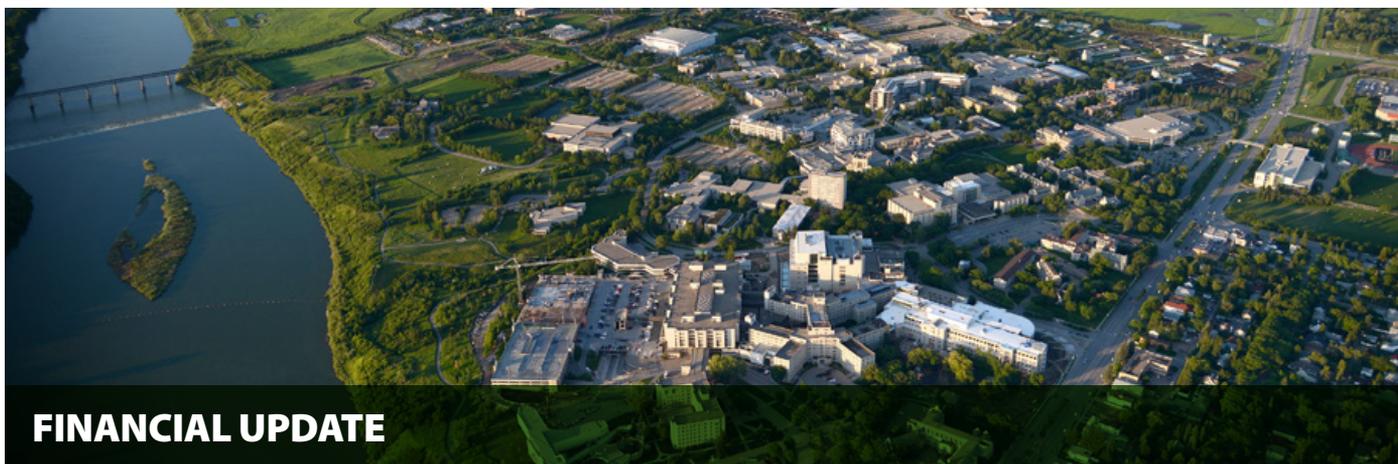
In fact, former student Jontae DesRoche has gone on to study as a pressure engineer after doing beamline projects in his final years of high school.

The learning wasn't all one-way. During their very first visit, students taught the synchrotron scientists how to say "beamline" in Dene. ■

Learn more online.

How to say "beamline" in Dene alumni.usask.ca/denebeamline

Map of all Students on the Beamline participant locations alumni.usask.ca/clsmmap



FINANCIAL UPDATE

Editor's note: Financial updates and information on TransformUS, and subsequent action plans, were just being released as the Green & White was going to press. For the most recent news and updates, visit transformus.usask.ca.

Since the financial update in the fall issue of the *Green & White*, two task force reports—one for academic programs and one for administrative units—were released, offering recommendations on where the university may achieve financial savings and where additional investment in priorities may be appropriate. Through this process, called TransformUS, the university is seeking to save \$20 - \$25 million in the annual budget, of which up to \$5 million may be reinvested in priority programs.

During the subsequent eight week feedback and consultation phase, several hundred comments were provided by U of S faculty, staff, students, alumni and donors via town hall sessions, phone calls, emails, comments on blog posts and through individual meetings.

On May 1, the Provost's Committee on Integrated Planning (PCIP) released documents identifying a set of coordinated actions in response to recommendations and feedback gathered during the consultation phase.

Four broad themes were identified:

1. Simplify and amalgamate structures.

Restructuring of some academic and administrative units can streamline processes and combine or simplify parallel or duplicate structures. This also seeks to address “work arounds” and fee-for-service models currently used on campus. A major restructuring of senior leadership and central administration is to be undertaken.

2. Tighten focus on the core missions of degree-credit teaching and peer-reviewed research.

This will move the university away from its historic mission of providing non-degree credit programs in Saskatchewan, offering them only when it is an integral part of an academic unit's mission. Actions will give clarity in how alumni and the general public are engaged in the academic mission of the university.

3. Implement shared services as an institution-wide model for administrative services and functions.

Reorganizing services will reduce fragmented, duplicate and sometimes competing services across campus. Functions involved include finances, human resources, ICT, student services, advancement, research and facilities.

4. Prioritization as an ongoing process.

Consistent with the core of the university's integrated planning, resources will continue to be invested in key areas that support our learning and discovery missions and overall advancement of the university.

It is anticipated that some decisions will begin in the 2014-15 fiscal year if they are within the decision-making authority of the unit leader, while others may take much longer to be implemented as they work their way through the university's governance processes as described in the *University of Saskatchewan Act, 1995*. For example, decisions on academic programs need to be passed through University Council and Senate, and time will be given for currently enrolled students to complete their program.

TransformUS is part of the university's overall plan to eliminate a projected budget deficit and ensure the ongoing financial sustainability of the institution. ■

More information on the process and background information can be found at transformus.usask.ca

CHANGES IN STORE FOR GRAD STUDIES

The committee charged with reviewing the operations of the College of Graduate Studies and Research (CGSR) has recommended changes to restructure graduate studies at the U of S.

A key recommendation of an interim report—which was developed in consultation with the CGSR and the Graduate Students' Association—is to transition from a separate college to more of an administrative unit with a focus on advocacy

of graduate students and facilitation of programs.

Consultations with the campus community and various governing bodies will help determine what functions can be conducted in a central administrative unit and what can be done at the college level. Examples of functions being discussed are admissions, financial aid, committee assignments, and setting up thesis and dissertation defenses.

Proposed changes would likely result

in graduate student supervisors having more authority than in the past, and that may significantly speed up some processes, particularly in the student's home college or department.

A review of CGSR was also part of TransformUS, the university-wide program prioritization process. The committee's recommendations align with the suggestions in the TransformUS reports. ■



NEW EXECUTIVE DIRECTOR FOR CLS

Australian scientist Robert Lamb has been selected to lead Canada's national synchrotron, the Canadian Light Source (CLS), effective Aug. 1, 2014.

Currently at the University of Melbourne, Lamb was the founding director of the Australian Synchrotron and is a recognized leader in synchrotron surface science. He has PhDs in chemistry and physics from the Universities of Melbourne and Cambridge, respectively, and more than 200 scientific publications and 39 patents.

Lamb is very familiar with the CLS, having previously served as chair of the facility's Scientific Advisory Committee, whose mission is to ensure that scientific programs at the CLS are of the highest quality.

Lamb will also hold a tenured full professorship in the U of S Department of Chemistry. ■

THREE NEW DEANS APPOINTED, ONE RE-APPOINTED



Highly regarded pharmaceutical researcher and educator **Kishor Wasan** has been selected as the new dean for the College of Pharmacy and Nutrition, effective August 1, 2014.

Wasan joins the U of S from the University of British Columbia (UBC), where he is presently a professor and associate dean of research and graduate studies in the Faculty of Pharmaceutical Sciences, and the director and co-founder of the UBC Neglected Global Diseases Initiative. He is also a Distinguished University Scholar and Canadian Institutes of Health Research/iCo Therapeutics Inc. Research Chair in Drug Delivery for Neglected Global Diseases

In addition to his role as dean, he will also be a tenured full professor.



Well-respected medical educator and administrator **Dr. Preston Smith**, who is currently senior associate dean, education at Dalhousie University's Faculty of Medicine, has been named the new dean for the College of

Medicine, effective June 1, 2014.

The in-coming dean completed both his undergraduate and postgraduate medical education at Dalhousie University, and is a fellow in the College of Family Physicians of Canada. In 2010, he completed a master of education in curricular studies, with a focus on medical education.

Smith has extensive involvement in accreditation success, curricular reform, distributed medical education and the

development of new educational programs, and he is recognized for his strengths in developing relationships, collaboration, consensus building and change management—all of which will prove to be invaluable as the college undergoes significant reforms.



Michelle Prytula (BComm'92, BEd'95, MEd'04, PhD'08) has been appointed dean for College of Education, effective July 1, 2014.

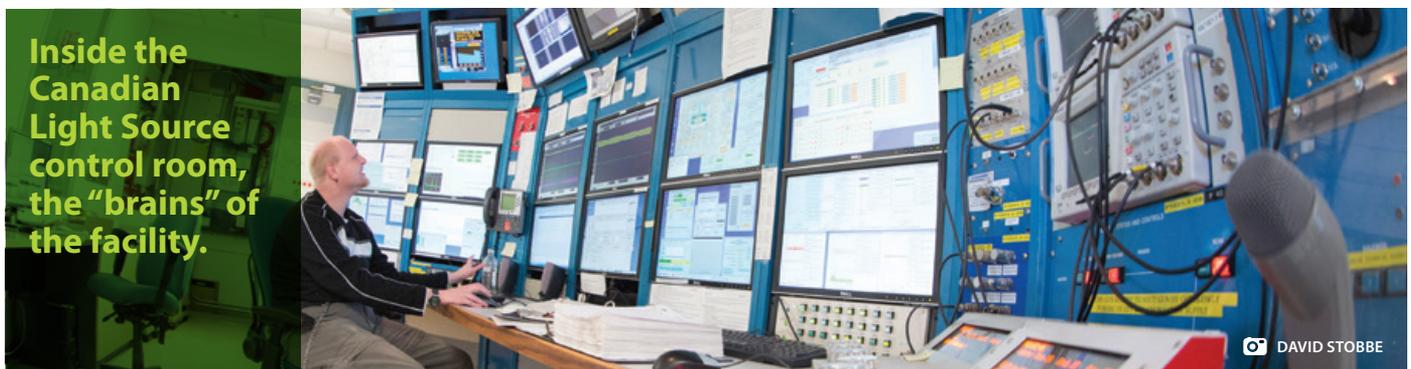
Prytula currently holds the position of associate dean, undergraduate programs, partnerships and research in the College of Education. She is a tenure-track assistant professor, who will become a tenured associate professor effective July 1.

Before becoming a faculty member, Prytula was a research assistant in the college's Department of Educational Psychology and Special Education, as well as a teacher, vice-principal and principal in the Greater Saskatoon Catholic School Division.

Mary Buhr has been appointed to a second term as dean of the College of Agriculture and Bioresources.

Buhr came to the U of S as dean on July 1, 2009 from the University of Guelph, where she was interim dean of the Ontario Agriculture College. She earned a bachelor of science in biology, a master of science and a PhD in biology, all from the University of Waterloo. Her research interest centres on sperm physiology and its relationship to fertility and artificial insemination.

All of the aforementioned appointments are for five-year terms. ■



DAVID STOBBE

SEED BARN MOVES TO MAKE WAY FOR HOTEL

The seed barn between College Drive and Griffiths Stadium, built in 1915, has been moved to its new location on East Road, just off Preston Avenue, to make room for a 10-storey, 203-room hotel project in the University of Saskatchewan's College Quarter.

A long-term land lease with Saskatoon-based P.R. Hotels Ltd. was signed for a dual-brand hotel development. The complex will combine a Holiday Inn Express and a Staybridge Suites in one building to offer accommodation to user groups associated with the university—visiting lecturers and scientists, meeting attendees, parents, athletes—as well as to the general public. Other potential users include federal facilities located on campus, Innovation Place tenants and Royal University Hospital.

The Holiday Inn Express wing will feature mid-to upper-scale rooms, while the Staybridge Suites wing will offer lodging with kitchen facilities in each suite for long-stay guests, although the suites can be rented by the night.

P.R. Hotels Ltd., owned by U of S alumni Lawrence (BEd'70, PGD'73) and Patricia



(BSc'69, C/Ed'70, BEd'70) Rychjohn, will take responsibility for all of the capital and operating costs of the project in return for the lease on the land. No university resources will be used in the development, but the U of S will benefit financially through the lease agreement.

The funds from the lease agreement will

be reinvested in the next phase of the College Quarter northeast precinct.

Construction is expected to begin in the middle of 2014 and be completed by the spring of 2016.

A similar funding model is being considered to replace the aging Rutherford Rink. ■

BIOXAS BEAMLINE GETS PROVINCIAL FUNDING



Beth Hornsburgh, associate vice-president of health research at the university and vice-president of research and innovation with the Saskatoon Health Region. In the background are (l-r) Graham George, U of S professor and Canada Research Chair in X-ray absorption spectroscopy; Rob Norris, Advanced Education Minister; Mark de Jong, interim CLS executive director. See page 14 for more information on BioXAS and George's research.

The Government of Saskatchewan announced funding of almost \$1.3 million for the BioXAS: Life Science Beamline for X-Ray Absorption Spectroscopy at the Canadian Light Source synchrotron to study molecular form and microscopic location of metals in biological systems with unprecedented sensitivity. ■

For more
information on
these and other
U of S news
stories, visit
news.usask.ca



SIIT AGREEMENT

Saskatchewan Indian Institute of Technologies President and CEO Riel Bellegarde (left) and U of S President Ilene Busch-Vishniac signed an agreement that will enable the two institutions to work collaboratively to create programs, initiatives and services that benefit the Indigenous people of Saskatchewan.

Saskatchewan Minister of Advanced Education Rob Norris is in the background. Earlier in the year, the two institutions signed an agreement to transfer business course credits to the U of S. ■

U OF S HISTORIAN RECEIVES KILLAM PRIZE



Jim Miller, professor of history in the College of Arts and Science and Canada Research Chair in Native-Newcomer Relations, has been awarded the 2014 Killam Prize in the Humanities.

Widely considered Canada's leading expert in his field, Miller received the award in recognition of his exceptional research career and lifetime of contributions to public service.

Miller is the second Saskatchewan recipient of the prestigious national award. Feroze Ghadially

of the U of S received a Killam Prize in Health Sciences in 1981.

The Killam Prizes, issued by the Canada Council for the Arts, are among Canada's top awards for scholars and scientists. Five prizes—one each in the humanities, social sciences, natural sciences, health sciences and engineering/interdisciplinary studies—are issued each year.

The Killam Prize is a capstone in Miller's distinguished career. He retires from the U of S this spring. ■



Federal Minister of Industry James Moore (middle) (MA'11) toured the CLS in August 2013.



Michelle Rempel (right), Minister of State responsible for Western Economic Diversification Canada, visited the CLS in January.

EXECUTIVE IN RESIDENCE



Marvin Romanow (BE'77, MBA'80), former president and CEO of international energy corporation Nexen, has been sharing his insight on business and management with the campus community as the

university's first-ever executive in residence.

Based in the Edwards School of Business, Romanow spends about one week per month on campus. Initially, he spent time getting a feel for the university and the potential scope of the position.

He has been consulted by a wide variety of people and topics, including college deans seeking advice on managing a college, faculty inviting him to share his business and management experience in the classroom, and students seeking career advice.

Romanow pointed out universities are very different than businesses and should not be run like a business, but universities can learn from business practices that are useful to them.

Although he is officially retired, Romanow is still a consultant and a member of various boards. He is unsure how long he will stay in his role at the university. ■



During Aboriginal Achievement Week (March 10-14), Buffy Sainte-Marie, founder of Cradle Teaching Project, signed a memorandum of understanding with the U of S to support Kindergarten through Grade 8 students in science, technology, engineering and math (STEM). ■

HUSKIES RECAP

Congratulations to the following U of S Huskies teams for their top 10 finishes at Canadian Interuniversity Sports (CIS) championships:

Men's basketball: fifth at CIS championship in Ottawa, ON

Women's basketball: fourth at CIS championship in Windsor, ON

Men's hockey: second at CIS championship in Saskatoon, SK

Women's hockey: third in CIS championship in Fredericton, NB

Women's track and field team: fifth in Edmonton, AB

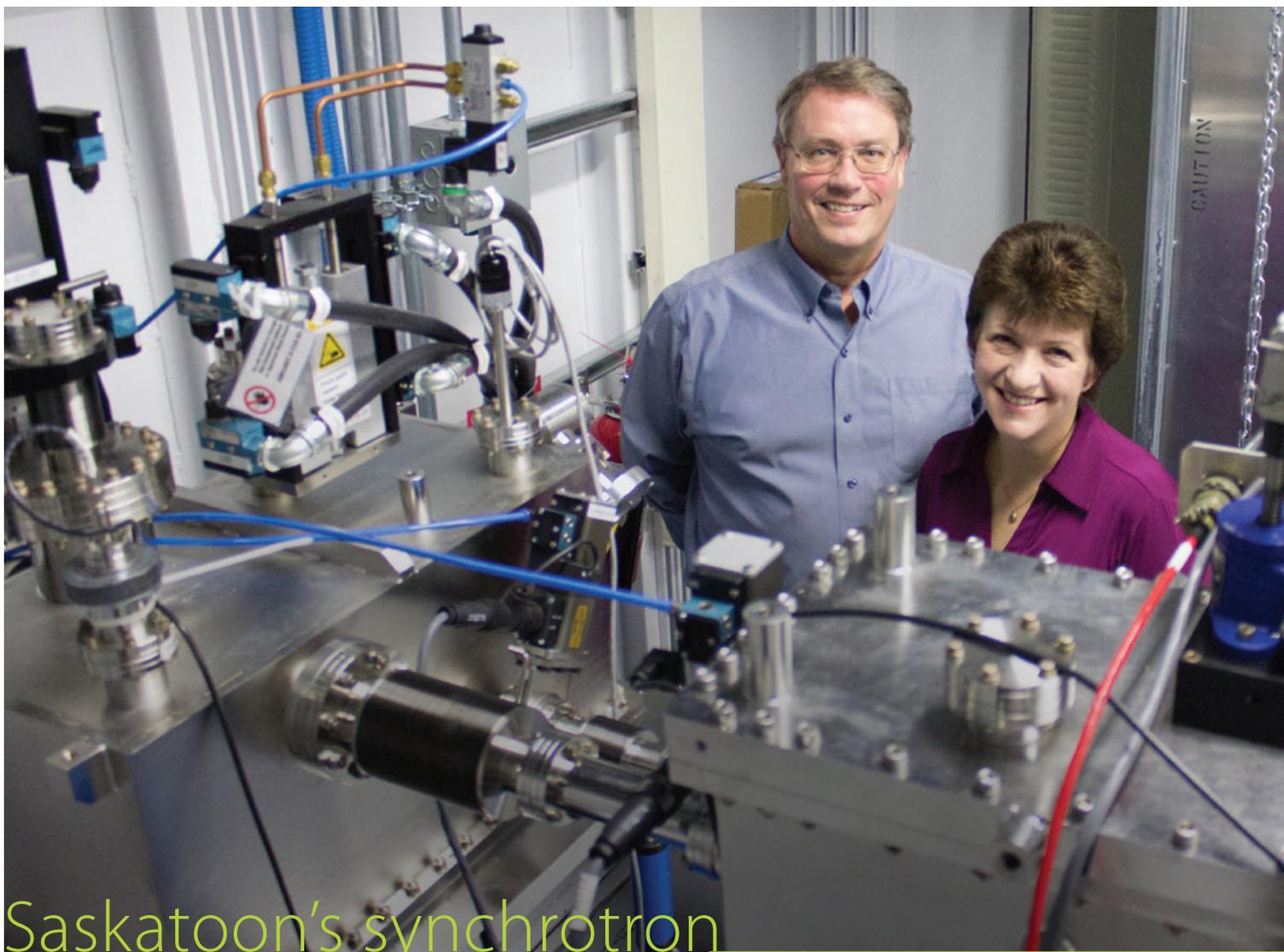
Men's and women's wrestling: ninth at CIS championship in Fredericton, NB

Men's soccer, sixth at CIS championship in Fredericton, NB

Get all your Huskies updates at huskies.usask.ca, where you can sign-up to Huskies Weekly delivered to your inbox.



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Saskatoon's synchrotron power couple

MARK FERGUSON

DERRICK KUNZ

The journey that brought married couple Ingrid Pickering and Graham George to Saskatoon seems atypical at first. But the research possibilities the Canadian Light Source (CLS) synchrotron offers is putting the University of Saskatchewan in the spotlight, attracting top-notch scientists—like Pickering and George—from around the world.

Both Pickering and George are U of S faculty and Canada Research Chairs, the former in molecular environmental science and the latter in X-ray absorption spectroscopy. They are using the powerful synchrotron light to examine

metals and how they affect people, other living organisms and the environment.

Born, raised and educated across the pond in the United Kingdom, the pair of scientists met in New Jersey, where they did research and development for Exxon.

From there, Stanford University recruited the couple to work at the Stanford Synchrotron Radiation Lightsource, home to one of the first working hard X-ray synchrotrons.

Eleven years later, Helen Nichol, now professor of anatomy and cell biology at the U of S, was promoting the university and CLS at the Stanford

synchrotron and convinced the couple to submit their resumés.

The two of them subsequently made a trip to Saskatoon for an interview and were impressed by the friendly prairie people. They fondly recall staff in the provost's office tending to their three young children while they were in an interview. "We didn't have any child care," said Pickering. "So, as we were in the provost's office, we could hear the secretaries enjoying our children."

"That would never happen at other places. People at the U of S are very open and friendly, at all levels," added George.



“... people from all over the university have ideas. Faculty are thinking of what they can do to use the synchrotron. If we needed selling, that did it.”

—Graham George

Enthusiasm across campus about the new synchrotron was appealing to the couple too. George said, “All kinds of people from all over the university have ideas. Faculty are thinking of what they can do to use the synchrotron. If we needed selling, that did it.”

Pickering added, “People here are interested in bouncing ideas, finding new and creative ways to solve problems.”

All of those factors were icing on the cake, but Pickering and George make it very clear there is really one reason they are here—the Canadian Light Source synchrotron. More specifically, the opportunity to be joint-scientific leads for three new state-of-the-art BioXAS beamlines that are nearing completion.

George described the project—jointly funded by the Canada Foundation for Innovation, the Government of Saskatchewan, the U of S and several other companies and institutions—as “world beating.” One thing that sets it apart is the ability to change resolution in the imaging beamline, comparable to changing the objective lenses on a conventional microscope. This is in stark contrast to the current practice at other facilities of using a different beamline or even going to a different synchrotron facility.

These new beamlines will help scientists look at metals and other elements in biology and in the environment with unprecedented sensitivity and clarity.

“Metals are key to the most interesting chemistry; they are involved in biological and environmental processes,” said George. There are good metals that provide some benefit to people, like iron. “We want to understand some of the real detail of how they do some of their chemical magic.

“There are bad metals like mercury; the toxic metals that have no beneficial roles whatsoever,” George continued. “Then there are metals that are downright ugly. They have a biological purpose, but something has gone wrong.”

BioXAS will allow researchers to probe metals at the molecular level to study, for example, the roles metals play in brain diseases like Alzheimer’s. And that could lead to better treatments.

“Arsenic is an element that has a bad reputation.... For humans, arsenic has no confirmed biological benefits. It is a poison that causes huge issues around the world,” said George. The couple is conducting ongoing research in Bangladesh, where arsenic poisoning affects 33-77 million people and accounts for

up to 25 per cent of deaths in the worst affected regions.

Symptoms of arsenicosis can include skin tumors and various forms of cancer. Efforts to clean the area’s contaminated water supply—such as deeper wells or purifications systems—have not been as effective as originally hoped.

Their research has revealed that selenium will bind to arsenic, allowing it to pass harmlessly through the human body. An original trial with selenium supplements gave mixed results. “We discovered participants were swapping medication,” said George. That made it almost impossible to determine if the supplements were working better than the placebo.

A small pilot in a more controlled clinical setting is showing promising results, and Pickering and George hope to attract funding for more wide-scale clinical testing. “The solution in the end may be to add selenium to table salt,” said George.

As an integral part of their research programs, Pickering and George supervise several PhD candidates and postdoctoral fellows. Pickering also leads the Canadian Institutes of Health Research Training grant in Health Research Using Synchrotron Techniques (CIHR-THRUST) that brings together health researchers with synchrotron experts to provide cross-disciplinary training for fellows at the masters, PhD and postdoctoral levels.

“THRUST brings together people who are doing things on the molecular level, like crystallography, with things like brain imaging, and large animal imaging on the BMIT line that gives the ability to image a whole living animal as large as a cow,” said Pickering.

The program takes advantage of the wealth of different disciplines at the U of S. “There are physicists and chemists and engineers who are interested in the techniques and want to make them better and tailor them to health applications. There are people from anatomy and cell biology, biochemistry, vet med and more conventional health disciplines across the university. And we’re bringing all of them together to talk about their synchrotron health research areas in a way that I think has been remarkably energizing for the group,” continued Pickering.

“Faculty and beamline scientists benefit because of the interconnectedness of the program. The synchrotron is such a brilliant way to bring people together like that.”

And it seems the CLS is bringing people together—across campus and from around the world. ■

What is the CLS synchrotron and

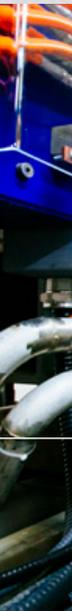
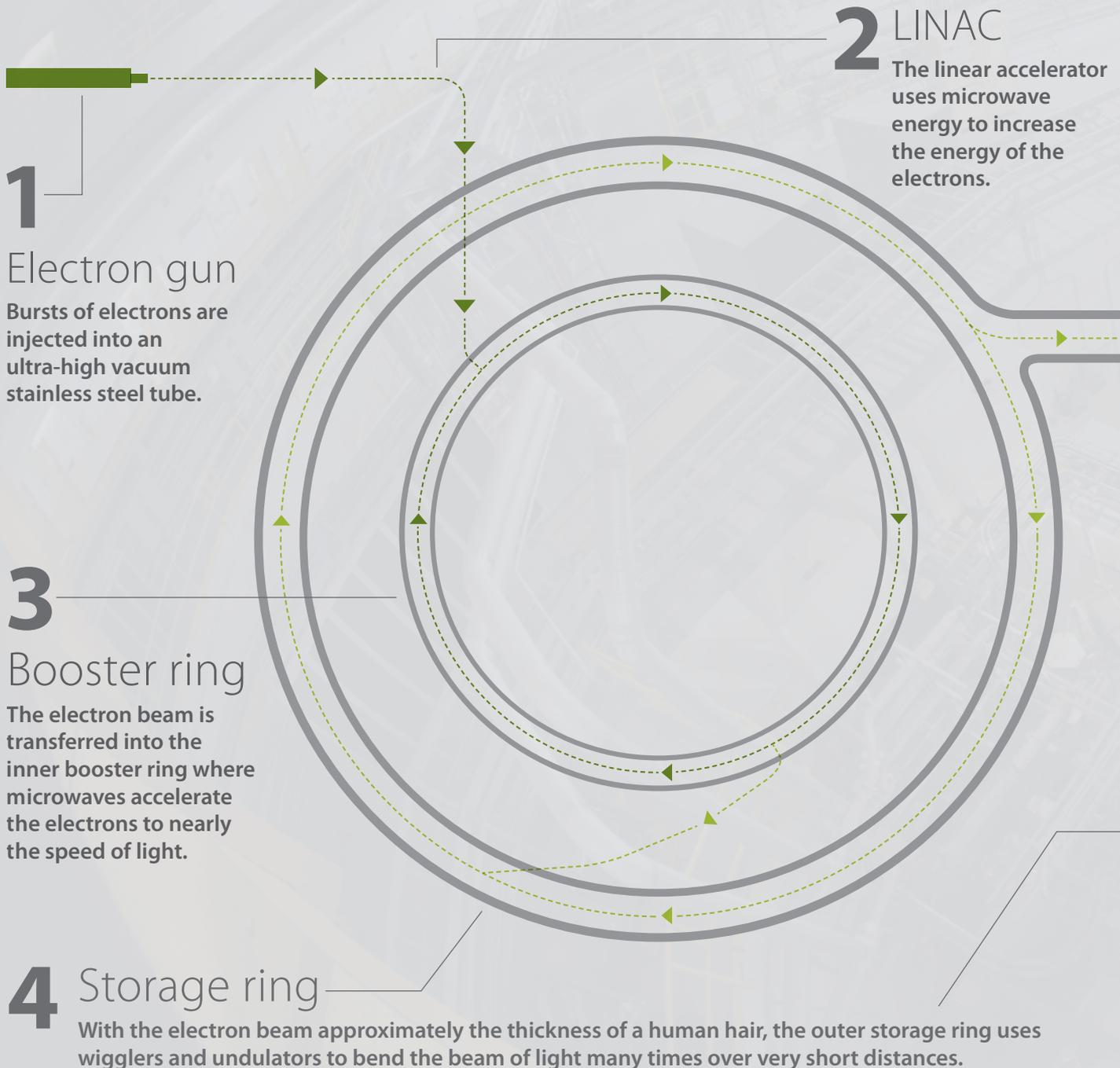
A synchrotron acts like a giant microscope. Intense beams of synchrotron light are generated to help scientists understand the nature and structure of molecules and materials.

The Canadian Light Source (CLS) is one of the most powerful in the world—producing light a million times brighter than sunlight—helping scientists find solutions to challenges in health, the environment and advanced materials.

Learn more online.

■ How does a synchrotron work?
alumni.usask.ca/synchrotron

■ Why the CLS is important to the U of S
alumni.usask.ca/aboutcls



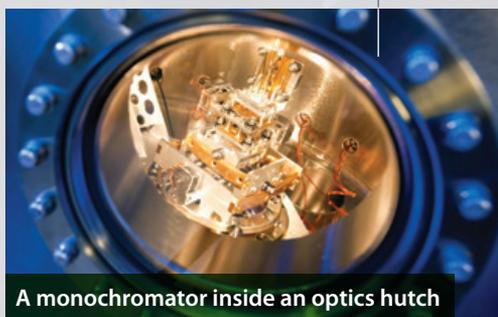
how does it work?

5

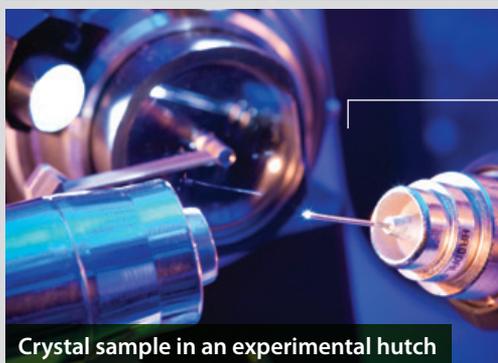
Synchrotron light
When high-speed, high-energy electrons are accelerated, or their path is bent by passing through powerful magnetic fields, a natural phenomenon occurs producing an extremely brilliant, full-spectrum beam of photons known as synchrotron light.



Electrons leave the booster ring and enter the storage ring on the left.



A monochromator inside an optics hutch



Crystal sample in an experimental hutch

6

Beamlines

Beams of synchrotron light are manipulated and directed onto samples.



Beamlines branch off the storage ring to hutches.

7

Optics hutch

The full-spectrum synchrotron light is segmented into portions of the electromagnetic spectrum by monochromators and is focused with specially curved mirror systems.

8

Experimental hutch

A selected wavelength of light is directed onto a sample, and a variety of detector systems collect data.

9

Work stations

Data is transferred to computers for storage and analysis. Scientists measure the amount of light that is absorbed, reflected or scattered by molecules.

Beamlines

Different spectra of light, such as infrared, ultraviolet, and X-rays, exit the storage ring and are directed down beamlines where researchers choose the desired wavelength to study their samples.

15

currently in operation

8

under construction

BMIT (Biomedical Imaging and Therapy) produces diffraction enhanced images with up to 33 times greater image quality than regular X-rays. The CLS has the only facility in the world that can image animals as large as a horse or cow.

 alumni.usask.ca/bmit

BioXAS (Life Science Beamline for X-Ray Absorption Spectroscopy) will help scientists look at metals and other elements in biology and in the environment with unprecedented sensitivity and clarity.

 alumni.usask.ca/bioxas

REIXS (Resonant Elastic and Inelastic X-ray Scattering) uses soft X-ray scattering to the study advanced materials including nano-scale biomaterials.

IDEAS (Industry, Development, Education, Applications & Students) is a hard X-ray beamline primarily used for industrial and educational purposes to study materials and environmental samples.

See lightsource.ca/beamlines for a complete list and explanation of CLS beamlines

How bright is synchrotron light?

Relative brightness in **photons per second mm²**

10,000,000

medical x-ray

1,000,000,000

candle

10,000,000,000,000

sunlight

10,000,000,000,000,000,000

synchrotron light

1,000

peer-reviewed papers resulting from work done at CLS

26,000+

eight-hour shifts by researchers on CLS beamlines

There are about

900 billion electrons

circulating in the storage ring

200 staff members at the CLS

37 student groups from **25** different communities have participated in Students on the Beamline (see page 8)

In 2013: **1,623** user visits from **883** unique users representing **133** institutions, organizations or companies from **19** countries

Online map of locations
alumni.usask.ca/clsmap



24

bending magnets (dipoles) in the storage ring

20

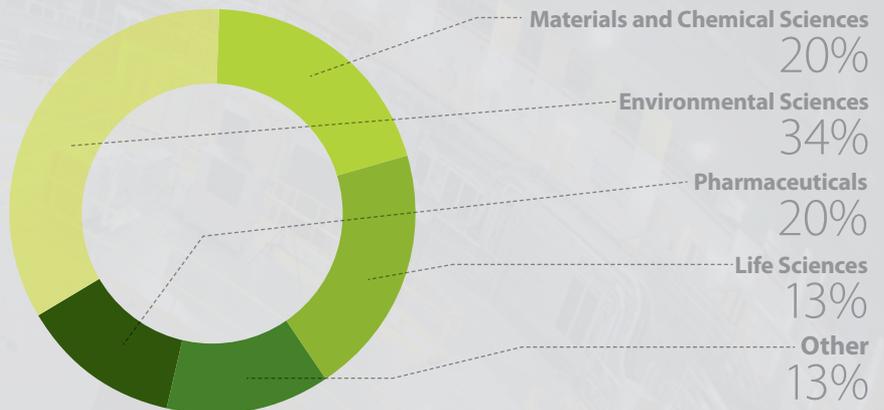
in the booster ring

Each weighs about



(or about the same as three Cadillac Escalades)

Industrial use by sector 2012-13



Electrons in the booster ring travel roughly

300,000 km/s

and could make a trip to the moon and back in approximately **2.5 seconds**



1,700 researchers have used the CLS

Each electron beam is about the width of a **human hair**



An electron circles the storage ring nearly

two million times per second

Excelling at accelerator science: a brief history

 MARK FERGUSON

The view from Les Dallin's office window is the same one he has had, more or less, for 40 years.

 MARK FERGUSON

The accelerator physicist at the Canadian Light Source (CLS) synchrotron began his career in the early days of the Saskatchewan Accelerator Laboratory (SAL) and helped shape the future of the synchrotron through years of work. After graduating with a physics degree from the University of Saskatchewan (BSc'71, Sc'72, MSc'81, PhD'90), Dallin landed a life-changing opportunity to work as an accelerator operator at the SAL.

"I remember watching the SAL being built in the '60s, and I always wanted to work there," said Dallin.

At the heart of the SAL—which was used for radiology, chemistry and sub-atomic physics research—was an 80-foot electron accelerator tube, known as a linear accelerator (LINAC), built below the office where Dallin hangs his coat today. The facility was completed in 1964, and under the direction of Leon Katz (DSc'89), one of Canada's foremost physicists, experiments at the SAL were some of the earliest instances of complicated electron scattering and photo and radiation chemistry—precursor experiments to modern synchrotron techniques.

"I remember doing night shifts in the depths of the SAL basement and I was the only one on shift, and I would hear all of this equipment turning on. It was frightening," Dallin joked.

Fear would prove less of a catalyst than ambition. Being surrounded by some of the brightest accelerator physicists in the world led Dallin to complete his graduate studies while continuing his work with the SAL.

Dallin was instrumental in the addition of the Electron Ring of Saskatchewan (EROS)—the first storage ring of its kind—to the SAL, and he was involved with the Canadian Institute for Synchrotron Radiation (CISR), the first group in Canada to push for a lightsource ring.

Experiments at the SAL flourished, but according to Dallin, it became obvious in the early 1990s that nuclear physics in Canada was in decline. Dallin and Dennis Skopik (DSc'10), the director of the SAL at the time, had ideas to turn things around.

The Natural Sciences and Engineering Research Council (NSERC), Canada's federal funding agency for science, accepted a proposal

from the CISR for a design study for a synchrotron in Canada but was eventually turned down.

"We didn't even have funding for the design study at the time, but we went ahead anyway," said Dallin. "We wanted to see what we could build here in Saskatoon to keep nuclear physics from being shut down. And at the time, the move was towards two kinds of new technology around the world: colliders and lightsources."

Colliders had appeal for nuclear energy research. But with only one real application for smashing sub-atomic particles, it was a better idea to propose a versatile synchrotron lightsource.

"The lightsource concept was really neat; it covered such a wide area of science: chemistry, biology, surface science, geology, nanostructures—endless possibilities."

Dallin's work on a proposal to bring a synchrotron to the SAL seemed like a far-away dream, but the SAL group was not prepared to quietly fade away. Specifically, he would draft the design study focused on the machine and equipment needed. The proposal document included the construction of a synchrotron

Timeline



Sir John Cockcroft, Nobel laureate, turns the first sod for SAL, May 10th 1962. University of Saskatchewan President J.W.T. Spinks watches.



Betatron outside the U of S Physics Building

facility connected to the SAL and a machine connected to the already existing LINAC.

“The design was great, everything looked good, but we didn’t know how much it would cost.”

Dallin said it was a stressful time trying to scrounge together as much information and cost estimates as he could get his hands on. In 1996, the proposal was submitted to the Canadian Government with an estimated price-tag of \$135 million that included the construction of a booster ring, accelerator ring, seven beamlines (experimental stations) and the building itself.

“It was a good proposal. I spent nine years working on it,” Dallin said proudly, holding up the bound book with a rendering of a facility that looks remarkably similar to the one that stands today.

At that time, where Canada’s first synchrotron would be built was still undecided. Only two locations were on the list: the University of Western Ontario and the U of S.

On March 31, 1999, staff at the SAL were uncertain of their future. The facility was scheduled to shut down the next day.

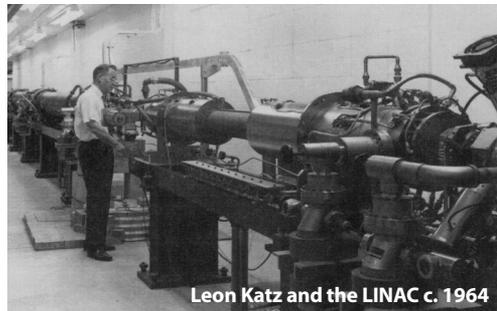
Dallin wasn’t packing his things. With a strong proposal for Saskatoon to be chosen as the site of the synchrotron, and with financial support already in place from the City of Saskatoon, the Government of Saskatchewan and the U of S, the future was bright.

On April 1, it was announced that a synchrotron lightsource facility would be built in Saskatoon.

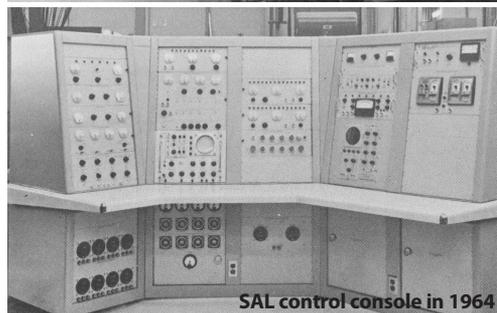
“Personally, I was confident we would get the facility,” said Dallin.

Over the next several years, the infrastructure began to take shape and a large football field-sized facility was built next to the SAL lab, just as Dallin had imagined.

“I’ve been in Saskatoon all my life, and to see a facility like this here really means something.” ■



Leon Katz and the LINAC c. 1964



SAL control console in 1964



Sylvia Fedoruk (BA'49, MA'50, LLD'06) positions the cobalt-60 unit

© University of Saskatchewan Archives, Harold E. Johns Collection

1948

The U of S becomes home to Canada’s only betatron, giving the department of physics a first-class facility for radiation treatment research and nuclear research.

1951

The world’s first non-commercial cobalt-60 therapy unit for cancer treatment is opened at the U of S.

1962

Sod is turned for the LINAC, an 80-foot electron accelerator tube that created energy six times that of the betatron.

November 1964

LINAC opens

1978

After a successful submission to the National Research Council (NRC), a Canadian beamline is built at the Synchrotron Radiation Facility (CSRF) at the Synchrotron Radiation Center at the University of Wisconsin-Madison.

1990

The Canadian Institute for Synchrotron Radiation (CISR) is formed.

Mid-1990s

NSERC decides to phase-out LINAC.

1994

NSERC decides a synchrotron should be built in Canada.

1996

An NSERC committee visits Saskatoon and recommends the synchrotron be built in Saskatoon.

1997

Canada Foundation for Innovation (CFI) is created to fund large scientific projects.

1998

A team led by SAL Director Dennis Skopik submits a proposal to CFI.

1999

SAL formally ceases operation, giving way to the newly formed Canadian Light Source Inc.

2002

The SAL-LINAC is refurbished to meet the needs of the synchrotron.

October 22, 2004

Canadian Light Source is officially opened.

Mark de Jong and the new electron particle accelerator that will produce medical isotopes

Learn more online.

alumni.usask.ca/isotopes

Can the CLS address a looming shortage of medical isotopes?

BEVERLY FAST

Researchers at the U of S are hoping to prove the value of the Canadian Light Source as a safe, reliable and cost-effective means of producing medical isotopes.

Imagine having heart disease and being told the test your cardiologist needs in order to identify a possible obstruction is delayed. Or having cancer and being told you will have to wait for the test that will show whether your treatment is working.

It has happened—is happening—not just in Saskatchewan but across North America. The problem is unexpected, recurrent shortages of the medical isotopes used in diagnostic imaging scans, particularly one called technetium-99m.

Technetium-99m is produced in just five nuclear reactors worldwide, with Canada's National Research Universal (NRU) reactor at Chalk River, Ont. producing the lion's share. After

an unnerving number of unplanned shutdowns over the past seven years (including a month that turned into 14 months in 2009-2010), Chalk River will cease production of technetium-99m in 2016, leaving a large gap in the supply chain.

The situation is serious. In 2013, over 9,100 procedures using technetium-99m were performed in the Saskatoon Health Region alone. Myocardial perfusion, lung perfusion and ventilation, renal, endocrine—these are just some of the common imaging tests that use the isotope. Every test is an individual waiting for a diagnosis, a family waiting for news.

Necessity being the mother of invention, researchers at the U of S are seeking to prove the



Canadian Light Source (CLS) can help fill the supply gap—safely, reliably and cost-effectively.

Technetium-99m – the Workhorse of Medical Isotopes

“Many of the nuclear medicine tests we do use technetium—it’s the most commonly used radiopharmaceutical. We use it for bone scans, for imaging tests of the heart, brain, kidney and liver,” said Dr. Paul Babyn, head of medical imaging at the University of Saskatchewan and Saskatoon Health Region.

Technetium-99m (Tc-99m) is a low level radioactive substance that, when combined with a biomolecule and inhaled, injected or ingested by a patient, gives off energy that can be seen by specialized gamma cameras during an imaging scan. Live images allow specialists to “see” how your heart is functioning, how blood is flowing through your lungs, whether cancerous tumors are growing or shrinking.

Shortages directly affect patients. “When we don’t have the amount of technetium-99m we want and need, we have to rationalize its use to ensure that the most critical patient needs are met. Sometimes that means delaying a patient scan or shifting some patients to other types of imaging tests. If a shortage were to be long-term, it could cause real difficulties,” Dr. Babyn said.

Given the advanced age of four of the world’s five medical isotope-producing reactors, governments around the world are keenly interested in developing a non-nuclear reactor alternative. Attention is focused on two approaches; one using a cyclotron, the other using an electron linear accelerator. Researchers at the U of S are involved in both.

The CLS Approach

Mark de Jong, director of accelerators at the CLS, is leading the Medical Isotope Project in collaboration with the Prairie Isotope Production Enterprise, in turn comprised of the Winnipeg Regional Health Authority, Acision Industries and the University of Winnipeg. “Both methods, CLS and PET cyclotron, will be complementary for a while,” he said. “Each has different benefits and challenges, but the CLS process produces less of the isotopes you don’t want; it’s cleaner.”

The new electron particle accelerator, or LINAC, was installed in 2012 and received its commissioning license from the Canadian Nuclear Safety Commission in 2013. The project is currently ramping up for its first test run.

The CLS will produce molybdenum-99 (Mo-99), the “parent atom” of technetium-99m. “We start with molybdenum-100 and use the electron LINAC to knock out one electron to create molybdenum-99. We send that to a radiopharmacy here or in Winnipeg, and they

extract the technetium-99m. The molybdenum decays to stable atoms, the radiopharmacy sends it back to us, we recycle it and start the process again.

“We’re just getting ready to start production of molybdenum-99,” de Jong said. “We have some final wiring and a couple weeks of tests to complete, and then we will request permission to have a production run of about 48 hours.”

“We’ll initially send the material to the Winnipeg group, which has already tested their process on smaller amounts of Mo-99 produced a year ago at a smaller LINAC at the National Research Council in Ottawa. It was enough to demonstrate the principle, but we need a larger amount, closer to the normal production quantity used in the hospital,” de Jong said.

The U of S is also developing a radiopharmacy facility as part of the PET cyclotron project. Once complete, some of the technetium-99 will be extracted in Saskatoon. This work will be led by Humphrey Fonge, a professor of medical imaging and pharmacy recruited from the University of Toronto last year.

Patients First

“The role I play is between Dr. de Jong’s team and the final product to patients,” Fonge said. “Once our facility is set up, we’ll be doing purification processes and further developing the technetium-99m to ensure it is comparable in quality to the product made in nuclear reactors.

“It’s all about patient care, that’s the biggest consideration,” Fonge said. “When there’s an interruption in the supply of technetium, patients don’t get the scans they need. Those scans are so important. Physicians need to have the right tests to make the right diagnoses, or to follow-up with their patient to see if they’re responding to treatment. Without these scans, physicians cannot be as confident in their diagnosis.”

With the 2016 shutdown of Chalk River production looming, the pressure is on to prove the technology and cost-effectiveness of the CLS Medical Isotope Project, to get the radiopharmacy up and running, and to start using Saskatchewan-produced technetium-99m in clinical trials.

“We’re fairly confident this product will meet the 2016 target,” Fonge said, “but it will definitely be a pressure pot for everyone over the next few years.”

De Jong is focused on the future. “If we can prove the process, the CLS could produce more than enough molybdenum-99 for Saskatchewan and Manitoba.” ■

“The electron accelerator at the CLS is a non-nuclear approach—there’s no radioactive waste and no concerns about nuclear non-proliferation, because we don’t use enriched, weapons-grade uranium.”

—Mark de Jong

CLS research that could change your life: synchrotron scientists curing the world's ills



 ASHLEIGH MATTERN

The Canadian Light Source (CLS) at the University of Saskatchewan gives researchers the chance to use advanced technology to answer some of the world's most pressing questions.

And the questions being asked might surprise you. Much of the research happening at the U of S synchrotron—the only one in Canada—could very well have a direct impact on your life.

How can we protect people from the damage strokes cause? How can we treat antibiotic resistant diseases like urinary tract infections? How can we better manage the nitrogen in soil so that we can grow enough food, but not harm the planet?

The synchrotron allows scientists to approach

problems in novel ways, taking research in new directions. It literally allows them to look at things in a new light; the synchrotron is a source of light so brilliant, it allows researchers to see structures down to the atomic level.

The CLS brings together researchers from around the world with a wide variety of backgrounds, creating a hotbed of multidisciplinary work, collaboration and innovation.

Whether they're giving us a deeper understanding of bone structure so we can combat osteoporosis, or discovering how methylmercury is absorbed by developing cells, the researchers at the CLS are laying the groundwork to create a better future for us all.



MARK HACKETT

MARK FERGUSON

How to improve stroke outcomes

Weakness, trouble speaking, vision problems, headache, dizziness—these are the signs of stroke, a sudden loss of brain function due to the interruption of blood flow to the brain. In Canada, stroke is the third leading cause of death, and responding to these warning signs early could save a life.

Aiming to learn how to protect the brain from the damage strokes cause, post-doctoral fellow Mark Hackett and his team used the Canadian Light Source and the Synchrotron Radiation Centre in Wisconsin to image the cerebellum and hippocampus regions of the brain, studying the protein and lactic acid pathways.

“If you were to know what cell was affected, or what type of neuron, that tells you a lot about the mechanistic pathway and allows you to tailor the drugs and therapies, target those cells that are being affected,” said Hackett.

With strokes, there is often a latent period; you have the stroke, and you are fine for a time before it gets worse. Hackett hopes his research

will lead to interventions that will stop some of the damage from occurring in the first place.

“There’s a window in time, where, if we can work out what the pathway that causes that delay is ... hopefully a drug therapy will be developed that could prevent that delayed degeneration from occurring.”

While Hackett and his team did not invent the imaging method, it is the first time it has been set up in Canada, and they were the first to use that imaging method to study protein and lactic acid.

This research proved their imaging method works, and that with this technique they are able to resolve lactic acid and protein within individual cells. Now they’re moving on to studying different kinds of strokes in animal models.

“How is any form of stroke different to a healthy brain?” Hackett is now asking. “What are the differences between the different types of strokes?”

How to cure antibiotic resistant infections



JULIE THOMPSON

DAVID STOBBE

Julie Thompson and Patricia Dowling’s recent research project had an unusual beginning. “It started off with me riding one of Trish’s horses across the prairies,” said Thompson, CLS industrial staff scientist.

Dowling, professor of veterinary clinical pharmacology at the Western College of Veterinary Medicine, mentioned a current problem in veterinary medicine is that urinary tract infections (UTI) caused by *E. coli* are becoming untreatable.

Thompson had no clue how to handle the animals, and Dowling had no clue how to use the synchrotron, but together they were able to conduct research that has never been done before.

Their research tested gallium—a metal with antimicrobial properties—as a possible cure for a UTI in mice. The synchrotron allowed them to see exactly where the drug went on a cellular level.

Although the research was done on animals, it was the human connection that attracted the funding for the project. UTIs are extremely common, with about 50 per cent of women

How to cure antibiotic resistant infections cont'd

expected to contract the infection in their lifetime. If this problem can be solved at an animal level, it could mean improvements in human treatments.

Unfortunately, the gallium didn't show any more efficiency than available treatments, but their research is still valuable. Thompson said they left a road map for other researchers, "How we went about testing and how other people can go about testing."

Dowling said that to solve the problem of antibiotic resistant UTIs, researchers are going to need to "think outside the traditional antibacterial box," and the power of the synchrotron makes it possible to do so.

"It opens the doorway to having novel ways of evaluating non-traditional treatments without having to do extremely invasive studies," said Dowling.

New drugs are usually related to old drugs, she said, but the synchrotron opens up the possibility of finding a treatment that's never been considered before.

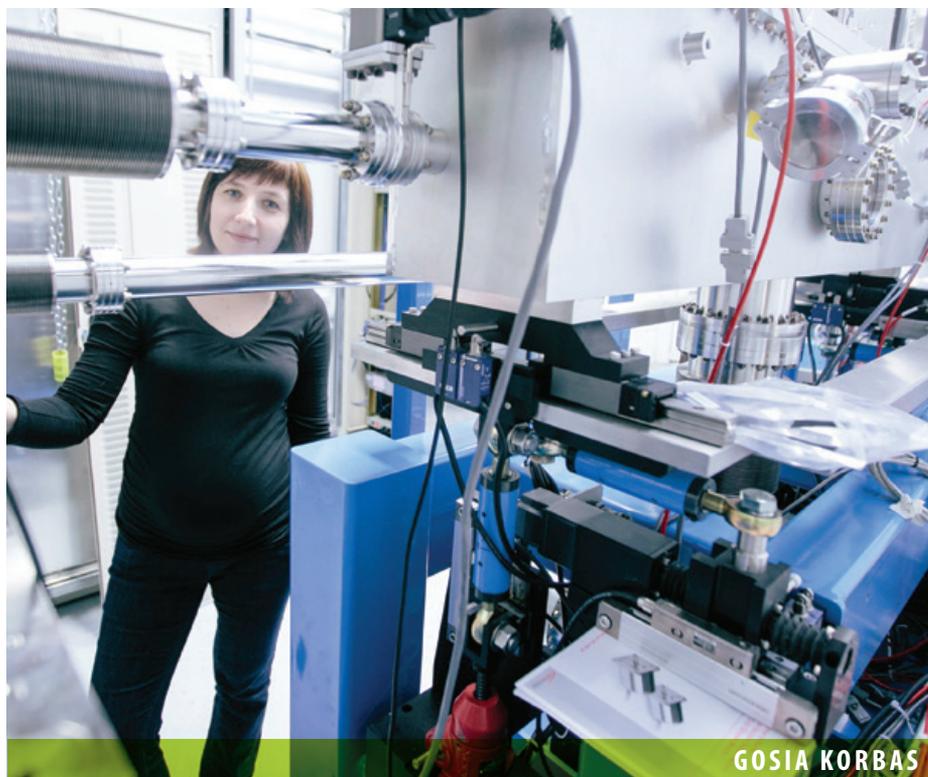
Having the synchrotron on campus is also opening doors for U of S students, planting the seeds for exciting future research. For example, Katherine Ball (DVM'02) worked on the project as a PhD student, and now has a unique understanding of the synchrotron's potential as a tool.

"Katherine is now a veterinarian who actually knows how the synchrotron works," said Dowling. "Somebody in that position has a clear vision to see all kinds of other possibilities."

“ For expectant mothers, they are told they shouldn't be eating certain fish, or they should limit fish, and if they understand why, it can help them to make healthy choices.

—Gosia Korbas

How to protect against mercury in fish



GOSIA KORBAS

DAVID STOBBE

Humans have been eating fish throughout recorded history, and Health Canada says seafood is an important part of a healthy diet. But certain types of fish—like albacore tuna—contain methylmercury, a toxic form of the metal that can be a health issue, especially for pregnant women and young children.

Mercury comes in different forms, with varying levels of toxicity. Methylmercury is the most toxic form. It is particularly dangerous for humans because it can penetrate the blood-brain barrier, and there are no known drugs that can remove the substance from the brain.

CLS staff scientist Malgorzata (Gosia) Korbas is hoping her recent research will help future chemists design a drug that can remove methylmercury.

In collaboration with U of S researchers Graham George, Ingrid Pickering and Patrick Krone, Korbas raised fish in water containing methylmercury to determine where the element accumulates and why it might accumulate there.

They used zebrafish, a type of fish often used in developmental biology because they are easy to raise, grow quickly and produce a lot of eggs. They are also transparent, making them easy to examine.

Studying the way the methylmercury interacts with the fish as it develops could provide clues to how the metal affects pregnant women and their developing fetuses.

"If you have a toxic compound, we first try to figure out what sort of cells and organs it targets," said Korbas.

In this research, they found the highest concentrations were detected in the eyes. They still need to conduct further studies to see if this is true as well for mammals, but this discovery could explain certain features of methylmercury poisoning, such as visual problems.

Once you know what organs are targeted, you try to figure out why. Right now, they don't have an answer to that question, but they are working to find out.

Korbas sees her research as important to raising awareness about the benefits and risks of eating fish.

"If people understand why they shouldn't eat too much of high-mercury fish, they will actually do that," she said. "For expectant mothers, they are told they shouldn't be eating certain fish, or they should limit fish, and if they understand why, it can help them to make healthy choices."

How to prevent osteoporosis

David Cooper (BSc'98, MSc'00), Canada Research Chair in synchrotron bone imaging, said there is a misconception that scientists already know how everything works, and we just need new drugs to fix the problems.

“The reality is we have a very poor understanding of how things work,” he said. “Basic biology and a fundamental understanding of how bones age, and how disease affects them, creates the platform for how we can create better treatments.”

His research at the CLS includes imaging human bones at a variety of scales, from across the human lifespan, noting how bones change with age and how the changes differ between genders. The work was done on small, post-mortem samples of bone, with most of the modern ones coming from the Melbourne Femur Collection in Australia.

Bone diseases like osteoporosis are extremely common. Osteoporosis Canada reports that fractures from the disease are more common than heart attack, stroke and breast cancer combined. More than one in four women over the age of 50 years has osteoporosis.

“These are disorders we are all going to face, either in our families or our own bodies,” said Cooper. “It’s important for the average person to realize their skeleton is a living entity in their bodies. Everybody has a sense that bones can heal, but people aren’t really aware of the huge impact of musculoskeletal disorders.... People don’t think of fractures as being dangerous, but they are linked to increased mortality in the elderly.”

It’s still too early to say exactly where their research might lead, but they do have some interesting preliminary findings. One of their graduate students looked at how the cellular organization of male and female bones changes across a lifespan.

“We see that in aging there are differences in the networks of cells in bones,” said Cooper. “If these changes bear out, they present new targets for understanding how bones age and how we could affect healthy aging.”

Currently the focus is treating osteoporosis, rather than preventing it. This research could give scientists a different perspective on how to keep bones healthy as we age.



DAVID COOPER

DAVID STOBBE

How to feed a hungry world



ADAM GILLESPIE
PROVIDED

We have more than seven billion people on Earth who need to be fed, and one of the key chemicals needed to grow food is nitrogen.

“Nitrogen is by far the biggest and most expensive input a farmer is going to encounter,” said Adam Gillespie (MSc'04, PhD'10), CLS research associate in soil chemistry.

As a post-doctoral fellow with Agriculture and Agri-Food Canada, Gillespie tested synthetic fertilizer, animal manure and legume sources of nitrogen to see how they affected the soil organic

matter, with the long-term goal of improving soil testing.

In current soil testing, the results only show the amount of nitrogen available now.

“It doesn’t take into account what might happen over the course of a growing season,” he said. “A synchrotron allows us to start learning about nitrogen that is still tied up in organic matter.”

Farmers may want to know in the long term how nitrogen management is going to affect

their organic matter. Knowledge about how the nitrogen is working in the field can help them make better decisions.

“We can’t provide a comforting recommendation to farmers ... because everybody’s operation is different, but what I think it does allow is to start building a framework of information that allows people to make longer term decisions.”

Nitrogen is necessary to grow food, but it’s also problematic. The creation of nitrogen is the number one chemical process in the world, with humans doubling the amount of available nitrogen in the biosphere. One of the gases created from the nitrogen is nitrous oxide—a greenhouse gas. And the nitrogen that runs off fields contributes to problems like algal blooms in bodies of water.

Gillespie hopes his research will help other scientists working on these problems, so they can learn how to use nitrogen more efficiently.

“Ultimately what we’re trying to do is balance any sort of this environmental impact with trying to feed people. So what would be really nice is if we could maintain food supply or increase food supply, and lower the inputs.” ■

Alumni Association president's message



I am happy to offer spring greetings, especially after the long, cold winter has released its relentless grip on much of our continent.

Earlier this year, Alumni Association board members met with

U of S President Ilene Busch-Vishniac to discuss the university's draft of *Vision 2025; From Spirit to Action*. We are grateful for the opportunity to offer our perspective on the importance of alumni to promote and achieve the long-term vision of the U of S. We strongly believe—and hope senior leaders agree—that alumni are crucial to the future success and reputation of the institution and must continue to be considered and consulted along with students, staff and faculty.

In the past several months, the Alumni

Association has made a concerted effort to be more visible on campus, to be seen and heard among those who will soon join the ranks of our alumni family. After all, we are students for a relatively short time and alumni for a lifetime.

During final exams in December and April, we provided healthy snacks and beverages at the university's seven libraries. Space with games, puzzles, snacks and even a therapy dog helped take students' minds off the stress of exams—something we can all relate to.

We were honoured to be given the Graduate Students' Association's (GSA) Partner of the Year Award. Our partnership made it possible for U of S alumnus and University of Prince Edward Island President Alaa Abd-El-Azi (PhD'89) to be the keynote speaker at the GSA awards gala.

An increased presence at Huskie games—at the PAC, Rutherford Rink and the University Cup, CIS men's hockey championship at Credit Union Centre in Saskatoon—also helps enforce the idea that alumni continue to play an active

role in the life of the university after graduating.

I invite you to play an active role with your Alumni Association. Some immediate opportunities to do so are:

- attend our Annual General Meeting on June 18,
- offer your time and experience as a member of the association board or on one of our advisory committees, and
- nominate a fellow U of S alumnus for an Alumni Achievement Award.

I want to draw specific attention to the award nominations. To ensure we are recognizing the best and brightest among our many distinguished alumni, we rely on you to submit nominations. Details and submission forms are available at alumni.usask.ca/achieve.

Sincerely,
Peter Stroh, BA'70, BEd'75, MEd'85
U of S Alumni Association President

Notice of Alumni Association's annual general meeting and special meeting for members to vote on proposed bylaws

Date. June 18
Time. 6:30 pm; reception to follow
Place. Convocation Hall, Peter MacKinnon Building

Reports and agendas will be posted at alumni.usask.ca/association/aggm
 To **RSVP**, visit alumni.usask.ca/events/registration or call 1-800-699-1907

Nominations for achievement awards

**Innovation,
 Public service,
 Community leadership,
 Philanthropy...**

Nominate a U of S alumnus for a 2014 Alumni Achievement Award.

Deadline: June 13
alumni.usask.ca/achieve

USSU Young Alumni Excellence Award



Stavros Stavrou (BSc'10, MSc'12) is the 2014 USSU Young Alumni Excellence Award recipient.

Stavrou obtained his bachelors and master of science degrees in mathematics from the U of S, Stavrou is now working toward a master of education degree in hopes of earning a university faculty position.

As the science outreach leader for PotashCorp's Kameskenow program and for the College of Arts and Science's outreach office, he helps deliver fun and engaging math and science activities. His job is to keep students at Saskatoon community schools on task and focused, which can require a fresh outlook on traditional teaching and an innovative approach to its delivery.

He is also the First Nations, Inuit and Métis math outreach co-ordinator for the Department of Mathematics at the U of S, teaching math in Saskatoon community schools that have a broad range of students.

With the help of Cree teacher Norma Bear (BEd'93), Stavrou is not just incorporating symbols and traditions into teaching. The pair is working together to incorporate Cree language into the math program at St. Frances School in Saskatoon. Their work was showcased at a First Nation's Language Keepers Conference in 2013, and Stavrou was awarded a certificate for his work as a language keeper.

Congratulations Stavros!

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▲ The College of Pharmacy and Nutrition kicked-off a year of centennial celebrations on the steps of the Thorvaldson Building last fall. A variety of alumni events have marked the milestone, which will conclude with a centennial reunion June 26-28.

Charles Till, BE'56, MSc'58, (second from right) was the guest lecturer at the College of Engineering's C.J. MacKenzie gala in January.



▲ Alumni Achievement Award recipients were honoured at an awards reception last fall.



The U of S Alumni Association was named the Graduate Students' Association's (GSA) Partner of the Year at the annual GSA awards gala.

(back l-r) Judy Buzowetsky, BEd'67, BSHEc'67; University of Prince Edward Island President and keynote speaker Alaa Abd-El-Azi, PhD'89; Alumni Association President Peter Stroh, BSc'70, BEd'75, MEd'85; Alumni Association Vice-President Wayne Evanisky, BComm'77; (front l-r), Director of Alumni Relations and Executive Director of the Alumni Association Melana Soroka, BA'84; U of S President Ilene Busch-Vishniac.



Stay in the know

Send us an up-to-date email address and other contact information to make sure you know about events in your area, alumni benefits and services, news from your college and to make sure you receive *Beyond the Bowl*, our monthly alumni e-newsletter.

alumni.usask.ca/update

President Ilene Busch-Vishniac continues to visit several locations to meet U of S alumni and friends to discuss the future of the institution.

Recent locations include Hong Kong (pictured), Ottawa, Victoria, Vancouver, Regina, Yorkton, North Battleford, Winnipeg, Swift Current and Calgary.



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alumni.usask.ca/linkedin

SHAUN LABIUK (BSC'97, PHD'03)



DAVID STOBBE

Crystals today, new drug therapies tomorrow

DERRICK KUNZ

The end result Shaun Labiuk (BSc'97, PhD'03), Canadian Light Source (CLS) research associate, showed me on a computer monitor resembled a puzzle. As he rotated a 3D image, he pointed to a gap in the protein molecule where a molecule of an experimental drug could potentially fit.

To get to that advanced stage of research can take years of work, time at one of the most sophisticated research facilities in Canada, and the help of Labiuk or one of his colleagues at the CLS's Canadian Macromolecular Crystallography Facility (CMCF).

First introduced to protein crystallography as a biochemistry graduate student at the U of S, Labiuk had to go elsewhere to get the data he needed. "There was no synchrotron at the U of S then, so I made trips to synchrotrons in the United States to do my research," he said.

Now Saskatoon is the destination of choice for many researchers, and Labiuk gets to do what he loves in his own backyard. "The thing I like most is being involved in so many different things. I get to study proteins from plants, animals, fungi, bacteria and humans. It's all very interesting."

The team of five CMCF scientists—consisting of Pawel Grochulski, Michel Fodje, James Gorin (BE'05, MSc'08), Kathryn Janzen and Labiuk—helps conduct high-resolution structural studies of proteins, nucleic acids and other macromolecules. They work with researchers to collect data and solve crystal structures of new proteins, many of which help researchers develop new ways of combatting diseases.

Labiuk explained the process: "You have to isolate the protein you want to look at, then crystallize it." He compared the process to growing sugar crystals by supersaturating water.

Crystal samples are then placed in the beamline and diffract the X-rays. "We record the positions and intensities of the diffracted rays of light. From that information we can figure out the 3D structure of an individual protein molecule.

"If you can see the detailed 3D structure of a molecule, you can see how the biology works. So you might have an enzyme that catalyzes a particular reaction, and you want to know how it does that. Pharmaceutical researchers will want to know the 3D structure of a target protein that

might be involved in a disease so they can design a drug to target that protein, perhaps activate or inhibit it depending on the disease."

Scientists from all over Canada, the United States and Europe use the two beamlines at the CMCF. Whether they send samples for analysis or make the trip to Saskatoon, they need the team of researchers at the CLS to train them how to use the facility and collect the data they need to further their research.

"The beamlines are also equipped with a robotic system that can change and position samples," explained Labiuk, so the research can be done remotely.

Protein structures solved from data obtained at the CLS—which has surpassed 400—are included in an online protein data bank that currently has over 98,000 samples to be used by researchers from around the globe. Labiuk said, "The exciting part is that is only a small fraction of what's possible." ■

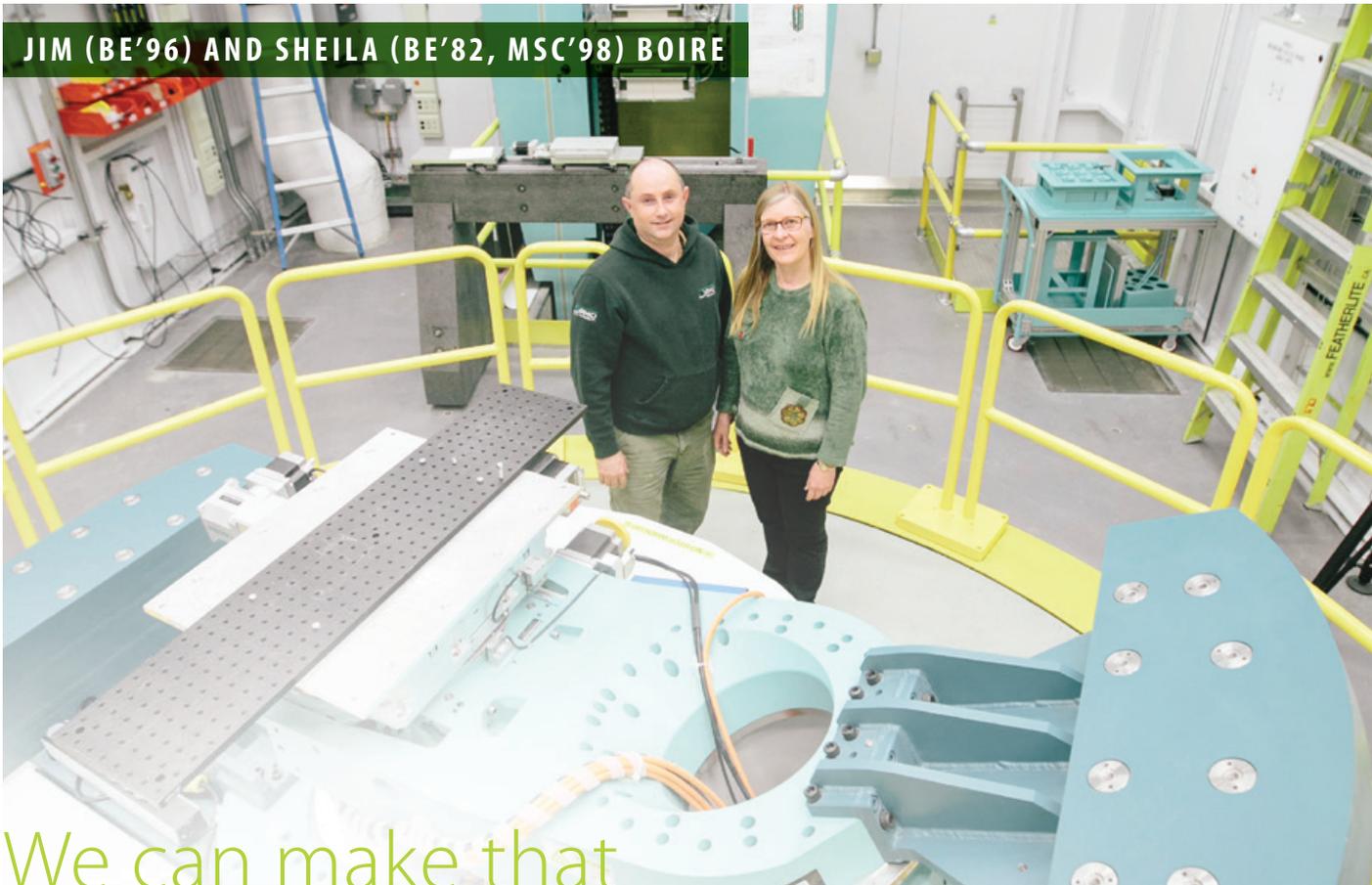
Editor's note: 2014 is UNESCO's International Year of Crystallography, marking, among other milestones, the centennial of X-ray crystallography.

Learn more online.

■ alumni.usask.ca/crystalsvideo

■ [Crystallography photo gallery
alumni.usask.ca/crystals](http://alumni.usask.ca/crystals)

JIM (BE'96) AND SHEILA (BE'82, MSC'98) BOIRE



We can make that

 DERRICK KUNZ

 DAVID STOBBE

Conducting cutting-edge research at a facility like the Canadian Light Source (CLS) requires customized, cutting-edge equipment. Jim (BE'96) and Sheila (BE'82, MSC'98) Boire, owners of RMD Engineering, have proven they are the right people for the job.

Jim was a machinist by trade before he came to the University of Saskatchewan to earn his bachelor of science in engineering. Sheila was working toward her masters at the time and just happened to be Jim's lab instructor.

"We started chatting, and Sheila needed parts for her research," said Jim. "I told her I could build them in a few hours to impress her. A friend and I pulled an all-nighter to get the parts done. The parts worked."

It appears the parts worked for both the research and to impress Sheila. They soon got married and started a family.

Years later, Jim and Sheila also started a company. When the opportunity to purchase a

machine shop presented itself, they jumped at it, and RMD Engineering was born. Over the last 10 years, RMD has grown from three people in a 1,200 square foot shop to 47 employees in a new 60,000 square foot facility. "For years we put everything back into the company," said Sheila. "We were the lowest paid employees at the company."

The ability to create and build custom equipment—from concept to completion—is what sets RMD apart from other shops. So when the CLS needed equipment for their biomedical beamline (BMIT), Jim and Sheila were asked to build the specialized equipment.

"The initial tender was for all the equipment. We declined because we didn't think we had the capacity to build it all," said Jim. "Then they came to us and said there is a bunch of stuff no one in the world will touch because it's never been built before. That's what we like doing."

The showpiece on the BMIT line is the large

animal positioning system—the only one of its kind in the world. You cannot move the position of the beamline to get the imaging needed for research, so the positioning system allows researchers to move an animal as large as a horse or cow into the necessary position.

"The U of S is a great place that gave us a great start, and that took us to a place like the CLS," said Jim.

Those relationships have opened several other opportunities for the Boires on campus. They provide equipment for the Western College of Veterinary Medicine, and Sheila is working on silicon crystals that will filter and diffract the brilliant CLS light. She said, "The work we are doing here plays a big role in helping them do amazing imaging and research."

"Researchers get excited about their work, but they can find limitations in the equipment available," said Jim. "We tell them, 'We can make that.'" ■

Learn more online.

■ **BMIT and the large animal positioning system**
alumni.usask.ca/bmit

■ **Timelapse of undulator assembly**
alumni.usask.ca/RMD

Share your story

Tell us the recent highlights of your career, achievements and personal updates.

Your story will be shared online in class notes and may be published in the next issue or in college publications. Visit alumni.usask.ca/classnotes.

1950

Mr. Art T. Wakabayashi, BA'53, BComm'53, of Regina, SK, received the Saskatchewan Order of Merit.

Mr. Lee G. Morrison, BA'56, BE'57, of Calgary, AB, received a Tax Fighter Award from the Canadian Taxpayers Federation for having declined the MP pension when he retired from parliament.

Prof. Emeritus Richard A. Rempel, BA'58, of Ancaster, ON, published a biography of W.P. Thompson, the first professor and head of biology and third president of the U of S, titled *Research and Reform: W.P. Thompson at the University of Saskatchewan*.

Dr. James R. Bolton, BA'58, MA'60, of Edmonton, AB, received a 2014 Alumni of Influence Award from the U of S College of Arts and Science.

Mr. Richard E. Carpani, BE'58, of Sarnia, ON, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Herbert D. Barber, BE'59, MSc'60, DSc'08, of Dundas, ON, was inducted into the Hamilton Gallery of Distinction on Nov. 12, 2013.

1960

Mrs. Phyllis M. Jones, BE'60, of Regina, SK, was awarded the 2013 Council of the Federation Literacy Award.

Mr. Dean T. Peters, BE'61, of Hastings ON, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Myron G. Britton, BE'62, of Sanford, MB, received the 2013 Engineers Canada Meritorious Service Award for Professional Services and was named a professor emeritus at the University of Manitoba.

Mr. Michael J. Tymchak, BA'63, of Regina, SK, received the Distinguished Service Award from the University of Regina.

Ms. Ruth W. Millar, BA'63, of Saskatoon, SK, received a 2014 Alumni of Influence Award from the U of S College of Arts and Science.

Mr. Robert J. Tomkins, BA'65, of Regina, SK, has been elected chancellor of the University of Regina.

The Hon. Gordon L. Barnhart, BA'67, PhD'98, of Saskatoon, SK, was appointed chair of the International Minerals Innovation Institute, received the Peter Lougheed Award for Leadership in Public Policy and received a 2014 Alumni of Influence Award from the U of S College of Arts and Science.

Mr. George H. Loewen, HosAdm'67, of Radium Hot Springs, BC, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Shakeel Akhtar, PhD'68, of Saskatoon, SK, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Keith O. Geddes, BA'68, of Kitchener, ON, received a 2014 Alumni of Influence Award from the U of S College of Arts and Science.

Mrs. Sheila D. Early, BSN'69, of Surrey, BC, is the first Canadian to be elected president of the International Association of Forensic Nurses in its 22-year history.

Ms. Regine G. Haensel, BA'69, BE'70, of Saskatoon, SK, has published her second book, *Queen of Fire, Book One* in the new fantasy series, *The Leather Book Tales*.

1970

Mr. Kenneth A. Rosaasen, BSA'70, MSc'78, of Saskatoon, SK, was appointed a director of the Saskatchewan Wheat Development Commission.

Mr. Ross G. Wilson, BA'70, BE'73, of Saskatoon, SK, a retired athletic director with Huskie Athletics, currently works as the long range scheduler for all sports offered by seventeen Canada West universities. He is also mayor of the resort village of Lumsden Beach, SK.

Prof. Emeritus Daniel R. Ish, BA'70, LLB'70, of Saskatoon, SK, was inducted an Officer of the Order of Canada.

Mr. Dennis A. Beerling, BA'70, BE'70, of Saskatoon, SK, was awarded the CTV Saskatoon Citizen of the Year for 2013.

Dr. Vernon G. Lappi, BE'71, MSc'77, MD'78, of Edmonton, AB, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Guy C. Vanderhaeghe, BA'71, Arts'72, MA'75, DLitt'97, of Saskatoon, SK, was awarded the 2013 Lieutenant Governor's Arts Award for Lifetime Achievement in the Arts.

Mr. Daniel R. Danielson, BE'72, BA'84, PGD'86, MEd'88, of Saskatoon, SK, was appointed a director of the Saskatchewan Wheat Development Commission.

Mr. Douglas L. V. Maley, BA'72, Arts'73, MSc'76, of Edmonton AB, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Loren F. Politeski, BComm'72, LLB'72, of Lloydminster, AB, was appointed Queen's Counsel by the Government of Alberta.

Ms. Patricia R. Katz, BSHEc'73, of Saskatoon, SK, recently published the book *Sketches of Saskatoon*, a collection of 40 of her ink and watercolor paintings that includes images of the U of S.

Mr. Donald S. McDougall, BE'73, of Regina, SK, was awarded the CTV Regina Citizen of the Year for 2013.

Mr. Ken H. Lewis, LLB'74, BA'94, of Lethbridge, AB, was inducted a fellow of the American College of Trial Lawyers.

Ms. Betty-Anne L. Heggie, BE'75, of Toronto, ON, was elected to the board of directors for Allan Potash Corp.

Mr. Laurence Etling, BA'75, of Valdosta, GA, USA, was promoted to professor in the Communication Arts Department at Valdosta State University.

Mr. Bruce R. Peachey, BE'76, of Edmonton, AB, was inducted a fellow of the Engineering Institute of Canada.

The Hon. Lillian K. McLellan, LLB'77, of Calgary, AB, was appointed deputy chief judge of the Provincial Court of Alberta.

Mr. Bruce A. Richet, BE'77, of Saskatoon, SK, has been appointed chair of the Corman Park-Saskatoon District Planning Commission, and chair of the Saskatoon Regional Economic Development Authority. He also joined CIMA+ as vice-resident, business development for Saskatchewan.

Ms. Donna M. Veale, BSPE'78, BE'80, MSc'85, of Saskatoon, SK, was inducted into the Saskatoon Sports Hall of Fame.

The Hon. Don R. Morgan, LLB'78, of Saskatoon, SK, was appointed Minister of Education by the Government of Saskatchewan.

The Hon. Miguel F. Martinez, LLB'79, of Lloydminster, AB, was elected president of the Law Society of Saskatchewan for 2013-2014.

Mr. Craig A. Mitchell, BComm'79, of Prince Albert, SK, received a lifetime membership in the Prince Albert and District Chamber of Commerce.

Mr. Andrew B. Kerr, LLB'79, BSc'79, of Vancouver, BC, was appointed Queen's Counsel by the Government of British Columbia.

1980

Mr. Lorne W. Valuck, D/Ag'80, of Shelbrooke, SK, received the Exemplary Service Medal from the corrections branch of the Saskatchewan Ministry of Justice.

Mr. Greg P. Marchildon, JD'80, of Regina, SK, received the Saskatchewan Health Research Foundation Achievement Award.

Mr. Terry M. Hughes, LLB'81, of Calgary, AB, was appointed Queen's Counsel by the Government of Alberta.

Mr. David A. Poulsen, BA'81, Arts'82, of Claresholm, AB, recently received his masters degree in creative writing from the University of British Columbia. The award winning writer was writer in residence at the Saskatoon Public Library in 2012-2013 and will be publishing his first adult mystery, *Serpents Rising*, in the fall of 2014.

Mr. Bernard E. Flaman, BA'81, of Southey, SK, was awarded the Architecture of Saskatchewan award and recently published the book *A Visual Journey*.

The Hon. John K. Mitchell, LLB'81, of Charlottetown, PEI, was appointed justice of the Prince Edward Island Court of Appeal.

Mr. James E. Vermeersch, BE'82, of Estevan, SK, was appointed a fellow of the Certified General Accountants Association of Canada.

Ms. Verna L. St. Denis, BE'82, of Saskatoon, SK, received the Special Recognition Award from the Canadian Teachers' Federation.

Ms. Lesia A. Maruschak, BA'82, Arts'83, MA'85, of Ottawa, ON, received the Governor General's Caring Canadian Award in 2013.

Mr. Veldanda V. Rao, BE'82, of Sugar Land, TX, USA, has been appointed managing director of the Galway Group, an investment bank and energy advisory firm in Houston.

Mr. Evert Van Olst, LLB'82, of Saskatoon, SK, was appointed Queen's Counsel by the Government of Saskatchewan.

Mr. Dan R. Anderson, LLB'83, BA'83, of Saskatoon, SK, was appointed Queen's Counsel by the Government of Saskatchewan.

Ms. Brigid Dooley-Tremblay, BA'83, of Kingston, ON, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Cliff A. Wieggers, BComm'83, of Saskatoon, SK, received the Manulife Securities Community Leadership Award in 2012 and the Barrington Wealth Partners Employee Appreciation Award.

Mr. Stephen J. Kmiec, BA'83, of Battleford, SK, was awarded the Exemplary Service Medal by the corrections branch of the Saskatchewan Ministry of Justice.

Mrs. Stacey G. McInnes, BE'83, of Carnduff, SK, is currently in her 30th year teaching.

Dr. Peter J. Doig, DMD'83, of Dauphin, MB, was elected the 94th president of the Canadian Dental Association.

Dr. Darcy D. Marciniuk, MD'84, of Saskatoon, SK, received the Canadian Lung Association Founders Award.

Mr. Alvin R. Bodnarchuk, BSPE'84, BE'85, of Saskatoon, SK, was inducted into the Saskatoon Sports Hall of Fame.

Mr. Darcy J. R. McGovern, BA'84, JD'86, of Regina, SK, was appointed Queen's Counsel by the Government of Saskatchewan.

Mr. David T. Madsen, BA'85, LLB'87, of Calgary, AB, was appointed Queen's Counsel by the Government of Alberta.

Ms. Shanon J. Selin, BA'85, of Vancouver, BC, recently published her first novel, *Napoleon in America*.

Mr. George E. Lafond, BE'85, of Victoria, BC, received the Peter Lougheed Award for Leadership in Public Policy.

Mr. L. David Dubé, BA'85, of Saskatoon, SK, was appointed to the U of S Board of Governors.

Mr. Norman L. Cutforth, LLB'86, of Lethbridge, AB, was appointed Queen's Counsel by the Government of Alberta.

Mr. James J. Johannesson, BSc'86, of Calgary, AB, has joined the University of Calgary as the executive director, development services.

Mr. Gary W. Poier, BComm'86, of Crossfield, AB, has started his own company, Aspire Personal Achievement Inc., specializing in facilitating retirement, personal growth and business succession planning workshops.

Ms. Terra-Marlee I. Ritchie, BA'86, of Saskatoon, SK, received the Johanna Miller Peace Award as a member of Iskwekuk E-wichiwitochik (Women Walking Together), a group representing missing and murdered Aboriginal women.

Mr. Gordon L. Tarnowsky, BComm'87, LLB'88, of Calgary, AB, was appointed Queen's Counsel by the Government of Alberta.

Ms. Shannon T. F. Skinner, BA'87, of Toronto, ON, received a 2014 Alumni of Influence Award from the U of S College of Arts and Science.

Ms. Judith A. Jones, BE'88, of Weyburn, SK, was appointed chair of the Southeast Regional College board of governors.

Dr. Matthew Schubert, MD'89, of Saskatoon, SK, received the Excellence in Teaching Award from the Professional Association of Internes and Residents of Saskatchewan.

1990

Ms. Theresa A. Johnston, BE'90, BA'94, BusAdm'99, of Spiritwood, SK, and her husband, Dwight Percy (BComm'76), are co-partners of Percy Communications, a communications business.

Mr. Tyler W. Tollefson, BSc'91, JD'92, of Edmonton, AB, earned MBAs from both Queen's and Cornell universities and is director of supply chain management at Enbridge Pipelines Inc.

Mr. Robert B. M. Little, BComm'92, of Calgary, AB, was appointed section leader, data and reporting services for the Alberta Energy Regulator.

Mr. Brent H. Penner, BA'92, of Saskatoon, SK, was appointed executive director of The Partnership with the Saskatoon Downtown Business Improvement District.

Staff Sgt. Kurtis W. Grabinsky, BA'92, BSPE'96, of Revelstoke, BC, was promoted to staff sergeant and detachment commander of the Revelstoke RCMP Detachment. He was also awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. John O. Agbenin, PhD'93, of Nigeria, was elected a fellow of the Nigerian Academy of Science with the Department of Soil Science Faculty of Agriculture.

Maj. Scott W. Carlson, BA'93, of Saskatoon, SK, was awarded a Queen Elizabeth II Diamond Jubilee Medal.

Mr. Scott W. Decksheimer, BA'93, of Calgary, AB, was awarded the Outstanding Fundraising Professional Award by the Association of Fundraising Professionals, Calgary and Area Chapter.

Mr. Kristofor P. Olson, BComm'94, of Paris, ON, is currently employed with the City of Brantford as an enterprise resource planning specialist and project manager, and he recently released a book titled *The Found Vagabond*.

Ms. Sandra L. Gordon, BSc'94, MSc'96, of Malmo, Sweden, is in an applications specialist at Pcovery in Copenhagen, Denmark.

Ms. Kylie M. Head, BA'95, LLB'98, of Regina, SK, was elected president of the Saskatchewan Branch of the Canadian Bar Association. She also received the national 2013 Lexpert Zenith Award.

Ms. Tracy M. Duncan, BSc'95, BE'96, of Calgary, AB, was inducted into the Saskatoon Sports Hall of Fame.

Mr. Gene A. Makowsky, BE'97, of Regina, SK, was inducted into the Saskatchewan Roughriders' Plaza of Honor.

Ms. Laurie A. Wadsworth, PhD'97, of Antigonish, NS, was appointed chair of the board of directors of Dietitians of Canada.

Ms. Erika E. Dyck, BA'98, MA'00, of Saskatoon, SK, received the 2013 New Researcher Award from the U of S.

Mr. Michael D. R. Farrer, BA'98, of Regina, SK, earned his professional designation as a certified general accountant from the Chartered Accountants of Saskatchewan.

Ms. Cindy J. Hingley, BA'99, BComm'99, of Regina, SK, earned her professional designation as a certified general accountant from the Certified General Accountants Association of Saskatchewan.

Mr. Jason J. Bazylak, BE'99, of Toronto, ON, was promoted to senior lecturer in mechanical and industrial engineering at the University of Toronto.

2000

Ms. Amy L. Alsop, BComm'00, of Regina, SK, was appointed community co-chair of the Government of Saskatchewan's Citizen Consultation Team.

Ms. Dallas L. Green, BComm'00, of Langham, SK, was appointed to the board of governors of the Certified General Accountants of Saskatchewan.

Ms. Namarta Kochar, BA'00, Arts'00, of Saskatoon, SK, received a 2014 Alumni of Influence Award from the U of S College of Arts and Science.

Mr. Jonathan S. Abrametz, BA'02, JD'03, of Saskatoon, SK, earned his professional designation as a chartered director from the Directors College, Degroote School of Business at McMaster University in Hamilton, Ont. He has also been appointed the chair of the Saskatchewan Transportation Company's board of directors.

Mr. Michael T. Lawton, BComm'02, of Saskatoon, SK, has been appointed president of the board of governors of the Certified General Accountants Association of Saskatchewan.

Ms. Aimey M. J. Bazylak, BE'03, of Toronto, ON, was promoted to associate professor in mechanical and industrial engineering at the University of Toronto.

Mr. Lyndon D. Rush, BA'04, of Sylvan Lake, AB, was named a finalist for Male Athlete of the Year for the Saskatchewan Sports Awards.

Mrs. Sally R. Meadows, BE'04, of Saskatoon, has released her second CD, *Red & White*, a Christmas/New Year's album.

Ms. Natasha D. Crooks-Day, JD'04, of Saskatoon, SK, was appointed to the Parole Board of Canada.

Ms. Sheena M. Carrick, BComm'07, of Imperial, SK, earned her professional designation as a certified general accountant from the Chartered Accountants of Saskatchewan.

Ms. Nicole J. Berg, BA'09, of Lashburn, SK, presented a copy of *Erpill the Caterpillar*, a book written by her mother that she illustrated, to the Duke and Duchess of Cambridge.

Ms. Sylvia McAdam, LLB'09, of Saskatoon, SK, is one of the founders of the Idle No More movement. The founding group has been named one of the 100 Leading Global Thinkers of 2013 by *Foreign Policy* magazine.

2010

Miss Cassy J. Blake, BComm'10, of Saskatoon, SK, earned her professional designation as a chartered accountant from the Chartered Accountants of Saskatchewan.

Mr. Kyle Christopherson, BComm'11, of Quill Lake, SK, earned his professional designation as a chartered accountant from the Chartered Accountants of Saskatchewan.

Ms. Jessica L. Hemauer, BComm'11, MPAcc'13, of Saskatoon, SK, earned her professional designation as a chartered accountant from the Chartered Accountants of Saskatchewan.

Ms. Jana K. M. Ross, BE'11, of Meadow Lake, SK, was the winner of the The Boom Box, CBC's Aboriginal business plan competition.

Mr. Ewan J. Currie, BA'11, of Saskatoon, SK, and his band The Sheepdogs won the Music Video of the Year at the 2014 Juno Awards for their song Feeling Good.

Mr. Benjamin J. Bergermann, BComm'11, MPAcc'13, of Saskatoon, SK, earned his professional designation as a chartered accountant from the Chartered Accountants of Saskatchewan.

Ms. Kristin D. Bews, BComm'11, MPAcc'13, of Saskatoon, SK, earned her professional designation as a chartered accountant from the Chartered Accountants of Saskatchewan.

Mr. David R. Ellingsen, BA'12, BComm'12, MPAcc'13, of Saskatoon, SK, earned his professional designation as a chartered accountant from the Chartered Accountants of Saskatchewan.

Julie E. Gailius, BSc'13, of Canyon, BC, was awarded the 2013 U of S President's Medal.

The Alumni Association has noted, with sorrow, the passing of the following graduates.

1930

Lefebvre, Frances H.
Puxley, Ruth E.

1940

Argue, Elizabeth A.
Beaton, Samuel E.
Berlie, Elmer M.
Bilokury, Evangeline M.
Burkell, Stephen R.
Crawford, Lucy A.
Dillabough, Margaret J.
Dyck, Clifford J.
Elasz, Howard H.
Eriksson, Paul C.
Ewing, Harlan T. (Gus)
Fisher, John I.
Gelmon, Miriam
Gross, Raymond A.
Hallgrimson, Jonas G.
Hamilton, Jonathan J. (James)
Harpur, Gerald S. (Bill)
Heimbecker, Raymond O.
Holtby, John H. (Jack)
Houston, Vernon A.
Kargut, Doreen M.
Kingsley, Gordon A.
Korven, Hans C.
Maimann, Clarence E.
McIntosh, Arthur J.
McLean, William J.
Mollard, Hilton C.
Moreau, Agnes G. (Genevieve)
Oliver, Reginald E. (Ernie)
Ormiston, Alexander W. (Pat)
Pettem, Delmar G.
Pickford, Roy
Powell, William S. (Bill)
Rabey, Joan M.

Reed, Lorne H.
Robertson, Duncan F.
Roddick, Gordon D.
Smart, Frances M.
Stann, Stefan A.
Treble, Arnold C.
Waite, Raymond K.
Ward, George E.
Warren, Joan E.
Wiggins, Arthur A.
Witten, Norman L.
Woolsey-Jones, Dorothy M.
Wright, Ruth A.
Zoerb, Gerald C.

1950

Bellamy, Frank W.
Benson, Edna A.
Biddell, Kenneth R.
Bieker, Ronald D.
Bocking, Douglas H.
Burgess, Mona D.
Callard, Reginald M.
Chernoff, Peter F.
Clark, Anna M.
Clark, Christine A.
Clayton, Richard E.
Coakwell, Malcolm A.
Couturier, Roger P.
Doell, Benjamin C. (Ben)
Elliott, Jeanne V.
Fleming, John T.
Freitag, Leo
Gittens, Rudolph O. (Rudy)
Gulstene, Kenneth N.
Hardy, Larry W.
Hartley, James E. (Jim)
Heidgerken, Rodger F.
Herle, Wendelin A.
Holswick, Marianne

Hrynewich, Peter
Irvine, Merlyn L.
Jeffery, Frederick R. (Fred)
King, Eleanore M.
Kirkland, Samuel J.
Knaut, George R. (Rod)
Kochanski, Walter
Kornelsen, Hedy M.
Kushnerenko, Peter
Kuttai, James G.
Langeman, Peter
Law, John D.
Linnell, Joseph T. (Joe)
Loeppky, Stanley R.
Macza, William N.
Madarash, Joseph
Madill, David G.
McIntyre, Lewis E.
Munro, Don G.
Neelands, Marguerite E.
Nesdoly, Victor
Patrick, Metro J. (John)
Pfeifer, Jeanne E.
Pollock, Ruth A.
Rankin, Joan M.
Riou, Gerard J. (Gerry)
Ritenburg, Lorne H.
Sanders, Ronald G. (Garth)
Stewart, David L.
Stilborn, Philip T.
Toth, Louis E.
Vulpe, Michel
Welbourn, Donald J.
Wong, Benny

1960

Ackerman, Joseph T.
Acton, Jean M.
Baker, Helen M.
Bens, Allan R.
Berger, Donna M.

Berryere, Edward G.
Bosche, Harold J.
Butterfield, Ronald D.
Cheston, Bruce C.
Cooper, John D.
Crawford, Ralph H.
Currie, Earl R.
Dancey, Jack W.
Daniel, Salomon M.
Dart, Robert E. (Bob)
Dobko, Anthony E.
Draeger, Ewald A.
Dunn, John H.
Evenson, Verona P.
Felton, Orly D.
Ficzycz, Nestor J.
Fjarlie, Earl J.
Giegler, Gordon D. (Dennis)
Heuchert, Gail M.
Hopkins, Douglas B.
Kish, Leslie
Korsrud, Gary O.
Koshlay, Bohdan B.
Kutarna, John A.
Kuzminski, Leonard M.
Lacey, Cyril
Langstaff, Margaret J.
Lendzyk, Peter
Love, Howard L.
Markland, Janet J.
Merkosky, Edward C.
Millar, Norman D. (Dave)
Nazarenko, Roy
Nickel, Clifford H. (Cliff)
Peet, Frederick G.
Pilling, William R. (Bob)
Popowich, Peter
Rempel, Gary R.
Scott, David R.
Sebulsky, Morris E.
Seipp, Leo B.

1960 (cont'd)

Shrubb, Norman
Smith, Derek A.
Strukoff, William G.
Sullivan, Albert E.
Symes, Lawrence R. (Larry)
Waters, Terence H.
Watkins, Edeana A.
Wildeman, Mervin J. (Merv)
Wiwchar, Orest E.
Wright, Philip J.
Yoshida, Tsutomu

Ehlert, Ronald E. (Ron)
Eichel, Ronald K. (Keith)
Elliott, Ramona M.
Flett, James H. (Harold)
Furmanic, Dennis A.
Gates, Mary J.
Globa, Raymond S.
Graham, Selina A.
Grise, Rosella M.
Hoberg, Darlyne E.
James, Constance L.
Jaques, Marc C.
Kinley, Kurt A.
Lahey, Alice L.
Lane, John M. (Jack)
Langston, Maureen C.
MacWilliams, Peter S.
Moore, Mavis A.
Mortenson, Larry R.
Oh, Tae H.
Peters, Hannah
Pooler, Walter H.
Prasse, Bruce F.
Purschke, John A.
Reiley, Joanna J.
Reiter, Josephine K.

Rieger, Allan W.
Selinger, Brian J.
Slik, Jacques M.
Slocombe, Robert J.
Surkan, Larry G.
Tollefson, Terrance S. (Terry)
Trask, David L.
Walker, Helen G.
Wallace, Betty F.
Wallace, Jane S.
Wanner, Lynn L.
Westlund, Harold P. (Peter)

Parker, Jo-Ann F.
Peterson, Shannon L.
Story, Gertrude E.
Thompson, Heather M.
Wigham-Stinson, Jacqueline A.
(Jackie)

1970

Amichand, Ivan B.
Baker, Lee M.
Beatty, Nita I. (Iona)
Bendig, Florian M.
Bodnar, Christopher D.
Carruthers, Carolyn L.
Chaney, John F.
Checkoway, Benjamin J.
Dauk, Ralph J.
DeWulf, Gerald B.
Dueck, Stephen J. (Steve)

1980

Bekolay, Todd A.
Berscheid, Gerald N.
Birch, Dianne K.
Blair-Clayton, Carole E.
Campbell, William R.
Feindel, William H.
Giesinger, Patricia E. (Patti)
Greschner, Elaine J.
Harper, Barry C.
Johnson, Perry K.
Lawlor, Alison M.

1990

Fredrickson, Linda A.
Nienaber, Eric H.
Ritchards, John G.
Thompson, Keith J.
Weir, Jacqueline A.
Xavier, Ilungo J. (Johnny)

2000

Gerwing, Katherine A. (Kathy)
Livingston, Sandra M.
Trumbley, Mark R.

2010

Ditto, Bonnie L.
Fjeldstrom, Susan J.
Ramos, Rafaela L.

The Alumni Association has noted, with sorrow, the passing of the following faculty, staff and friends.

Ambrose, Brian J.
Backman, Allen M.
Bakshi, Manmohan
Benson, Edna
Brook, Rose
Chisholm, Ian A.
Clark, Dale P.
Fehr, William
Ferguson, Paul D.
Klein, Howard A.
Law, Mable W.

Lucas, Barry G.
McDonald, Ian M.
Newman, Jack M.
Peters, Susan
Popkin, David R.
Reilly, Marcella L. (Marcie)
Scott, Peter A.
Sisodia, Chaturbhuj S. (Chatur)
Spilchuk, Jerry M.
Stuchenko, Allan G.

Editor's note

In response to a frequent and long-standing request, we have listed all the names of deceased alumni since the last issue. Names are listed by decade of receipt of their first U of S degree.

To accommodate this change, degrees, date of death and city of residence will be listed online only.

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First-year psychology student Dijana Sneath was the winner of a prestigious entrance scholarship from the government's Saskatchewan Innovation & Opportunity Scholarship program (SIOS).

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*No purchase is required. There is one (1) prize to be won. The winner may choose between an amount of \$60,000 CAD to build a dream kitchen of his/her choosing or \$60,000 CAD cash. The winner will be responsible for choosing a supplier and for coordinating all of the required work. The contest is organized by Security National Insurance Company and Primum Insurance Company and is open to members, employees and other eligible persons who reside in Canada and belong to an employer, professional or alumni group which has entered into an agreement with the organizers and is entitled to receive group rates from the organizers. The contest ends on October 31, 2014. The draw will be held on November 21, 2014. A skill-testing question is required. Odds of winning depend on the number of eligible entries received. The complete contest rules are available at melochemonnex.com/contest.

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Senate Election 2014

Voting open from May 5 to
June 20, 2014 at 4 pm

There are five positions available.

All members of Convocation are eligible to
vote for member-at-large candidates.

Candidates for Members-at-Large:

- | | |
|---------------------|----------------------|
| - Jenalene Antony | - Richard Rempel |
| - Davida Bentham | - June Schultz |
| - Rob Huck | - Jordan Sherbino |
| - David Kelly | - Michelle Thompson |
| - Jeffrey MacDonald | - Christopher Triggs |
| - Jordan Miller | - Joyce Wells |

Biographical information for the candidates is
available at the University Secretary website at
usask.ca/secretariat.

How to vote

1. Using your web browser, go to
paws.usask.ca
2. Log in using your NSID and password
3. Click on the "Vote" tab and follow the
instructions provided. You may vote for up
to five candidates for members-at-large
4. Once you have submitted your ballot you
will not be able to go back in to change
your vote.

**To vote you will need a U of S Network
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a password.** All graduates have NSIDs
and passwords; if you do not know your
NSID number or password, please contact
the Customer Service Centre, University
Advancement at 306-966-5186 or
1-800-699-1907 or by e-mail at
alumni.office@usask.ca.

If you are not able to vote electronically,
a paper ballot will be available from the
Customer Service Centre. Returned ballots
must be received by June 20, 2014.



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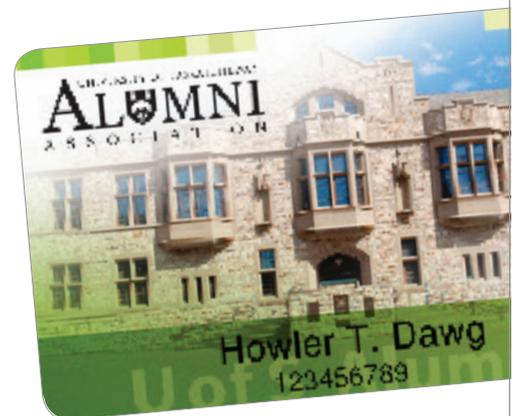
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Dr. Holly Wells (MD'87) has many passions, including the U of S, her radiology practice and horse jumping. Her future estate gift to the U of S will allow researchers and students to leap boldly toward new opportunities – and for that we are truly grateful.



A graduate of the College of Medicine at the University of Saskatchewan, Dr. Wells runs her own radiology practice in Prince Albert which she describes as “lumps and bumps and babies and gallbladders—and emergencies”. But outside of office hours the word ‘practice’ takes on new meaning. Dr. Wells competes in triathlons and currently owns two horses, one of which is training with the US Olympic equestrian team.

Dr. Wells is making a bequest to the U of S through her Will to support both the College of Medicine and the Western College of Veterinary Medicine. Her gift will allow future students and researchers to reach great heights in their work, just as she has.

Please contact us for more information on how you can set up a gift through your Will, like Dr. Wells.

➤ **Bev Cooper**

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