

Newsletter

Summer 2020 Issue 6



A Message From the Head

Dear colleagues and friends,

It has been a remarkable year for the Department of Chemistry. On top of a highly-active and productive year in teaching, research and outreach, the last five months of our operations have been massively impacted by the Covid-19 pandemic which has swept the world. The pandemic transformed the University almost overnight, requiring an almost instant transition from normal operations to trying to work at a distance using remote methods. The impact this has had on meeting our teaching and research mandate has been enormous. There have been numerous challenges, most immediately on undergraduate teaching operations, where the Department had to learn, almost overnight, how to deliver our program using remote methods.

Equally challenging has been our research program; all in-

person research labs shut down and our graduate students and postdocs experienced major disruptions in their programs. Lab, shop and office staff have been equally impacted and continue to face major, ongoing challenges.

Throughout this entire, unprecedented time, I have been continually astounded by the resiliency, patience and upbeat attitude demonstrated by all members of the Department. Despite job, career, and financial hardships, as well as physical and social isolation, our people have persevered. The winter 2020 undergraduate semester, including final exams, was completed using remote methods and ran astoundingly smoothly. Thesis defenses have been running online and our students continue to do an excellent job defending their theses under trying circumstances. (continued p.2)

BE WHAT THE WORLD NEEDS

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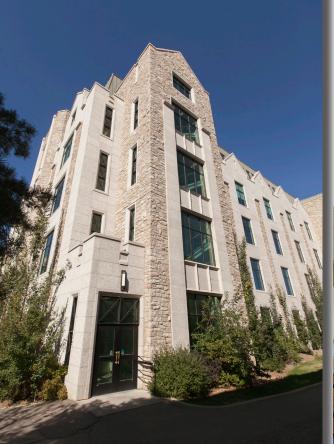
https://artsandscience. usask.ca/chemistry/



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Head's message continued...







Department Head Matthew Paige

after lenathy Now, lockdown, majority the of research groups have returned in-person research and graduate student laboratory work is resuming, albeit running rigorous under safety protocols. Many of our operations are operating in different ways (e.g. curbside pickup at Chemistry Stores, office staff working remotely) but we are slowly returning to business.

The fall 2020 undergraduate program will be offered using remote methods, and this will again require a huge effort on the part of faculty,

staff and students to successfully operate. Nonetheless, based on everything I have seen to date, we will not only survive, we will thrive.

The newsletter below highlights just some of the many excellent accomplishments related to research, teaching and outreach in the Department over the past year. One particular point that is worth re-iterating: the Department continues to benefit from both new and ongoing support from our alumni through scholarships and endowment donations. New this year

has been a truly remarkable donation, which has founded the Wilma Elias Scholarship for Women in Chemistry, as detailed in the article below. Other, ongoing support has also been crucial for our students. As you will be aware, the province, university and College are all facing significant financial challenges this year, and the ongoing support of our alumni continue to be of utmost importance for our Department. We thank you for your continued support.

In terms of the upcoming year, there are several major, exciting initiatives in the works. The Department is about to undertake a major review and reform of our undergraduate program, and we expect this to completely transform the way that we teach chemistry. Stay tuned for updates as we proceed; we will be actively polling our recent alumni for feedback on our past program and appreciate your guidance as we modernize our program. We are also working closely with the College of Engineering, as part of their reform of their 1st year undergraduate program. And of course, we anticipate our thriving research program to continue its high-impact success.

As always, I extend an invitation to all of our alumni to get in touch and to tell us what you're doing. We are eager to celebrate your success, connect you with our students and continue to include you as members of the Department of Chemistry. Please keep in touch and accept our best wishes for a healthy and successful year.

Emeriti Honours



Ron Steer received a 2020 College of Arts & Science Alumni of Influence Award. The awards recognize and celebrate outstanding alumni

whose remarkable achievements and contributions are having an impact on their fields, their community and the university. Dr. Steer received an Honours BA in 1964, a PhD in Chemistry in 1968, and held a Chemistry faculty position for 47 years until his retirement in 2016. He holds the title of distinguished professor emeritus and remains active in research in the Department.



Soledade
Pedras
received the
designation of
Distinguished
Professor
Emerita, as
of January
1, 2020. The
Distinguished
Professorship
Program
was created

to honour and celebrate outstanding achievement in research, scholarly, or artistic work by University of Saskatchewan faculty or emeriti. Dr. Pedras was a faculty member in the Department of Chemistry from 1994 to 2019 and was appointed a Tier 1 Canada Research Chair in Bioorganic and Agricultural Chemistry from 2004-2018.

Appointment

Matthew Paige was appointed Department Head for a five-year term, effective July 1, 2019.

Promotions

Tim Kelly (below left) and **Lee Wilson** (below right) were both promoted to Full Professor, effective July 1, 2020.





Milestones

As of 2020, **Stephen Urquhart** has been with our Department for 20 years. **Ian Burgess** and **Rob Scott** have both reached 15 years in the Department.

Thank You Celebration

In June 2019, faculty, staff, and family members gathered at Pike Lake to say "Thank You" to **David Palmer** for his service as Department Head. Dr. Palmer was first appointed Acting Head in 2010 and Head in 2011, and provided exceptional leadership throughout his tenure. The celebration day was very well-attended and other than a few spots of rainy weather, was a great day out. Dr. Palmer is taking a well-earned sabbatical this year and will be back to full-time teaching and cutting-edge research in the near future. Thanks again, Dave!



Faculty News





Chris Phenix (above left) and Eric Price (above right) have started a new collaboration with Dr. Mike Moser (Department Surgery) to an address an unmet need in cancer treatment. Dr. Moser is one of a few specialists in Canada who uses a technique called Irreversible Electroporation (Nanoknife) to successfully treat liver and kidney cancers at Royal University Hospital. The Nanoknife blasts tumours with reducing electrons, effectively killing the cancer Unfortunately, the efficacy of the Nanoknife is low

for pancreatic tumours, one of

the most deadly cancers. To address this issue, Drs. Phenix and Price have recently prepared model prodrugs that were chemically activated by the Nanoknife to stimulate the release of a payload. With recent grants from the Saskatchewan Health Research Foundation and

the Royal University Hospital Foundation, the team will synthesize and test novel prodrugs intended to boost the efficacy of the Nanoknife for treating pancreatic cancers.

Andrew Grosvenor, Rob Scott, Stephen Urquhart, and Associate Faculty Ed Krol all saw their NSERC Discovery Grants renewed.

Tim Kelly received the Canadian Journal of Chemistry Best Paper Award for 2020.

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Staff News



The department welcomed **Brent Brososky** as a Storekeeper in Chemistry Stores in November 2019. Brent previously worked in a Storekeeper role with Veterinary Medicine.

Erin Wasylow received the 2020 Dean's Distinguished Staff Award. Erin has worked in the department since 2016, first as a half-time Clerical Assistant and now as Office Coordinator. The award recognizes employees of the



College of Arts and Science who have set themselves apart through excellence in work performance and quality of service.



Also nominated for the 2020 Dean's Distinguished Staff Award was Scientific Glassblower, **Rick Elvin**, who has been with the department since 1986.

Sessional Lecturer
Pearson Ahiahonu
assumed the role of
First Year Lab Manager
while covering a oneyear leave during the
academic year.



Two half-time Clerical Assistants staffed the main office this year: **Megan Kennedy** (Fall 2019) and **Muriel Miller** (Winter 2020). Megan and Muriel provided front-desk reception during the regular term and assisted students, staff and faculty.

Adjunct Faculty

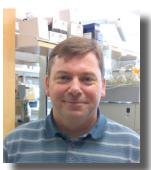
There were two adjunct faculty appointments this year.

Scott Rosendahl is the mid-Infrared beamline staff scientist at the Canadian Light Source (CLS), where he oversees scientific research and development on this cutting-edge research beamline. He holds a BSc in Chemistry from McGill University, as well as an MSc and PhD in Chemistry from the University of Saskatchewan, Dr. Rosendahl will carry out collaborative research with Chemistry faculty and facilitate access of Chemistry graduate students to valuable synchrotron measurements. Dr. Rosendahl will also contribute to the department's teaching mandate and will be teaching a graduatelevel module this fall.

Randy Purves is a nationally recognized expert in the area of bioanalytical applications of mass spectrometry. He holds a BSc from the University of Calgary and a PhD in analytical chemistry from the University of Alberta. In addition, he has approximately 20 years of experience in both academic research facilities (National Research Council, Canadian Food Inspection Agency) as well as industrial research laboratories (MDS Sciex, Merck Frosst). Dr. Purves will contribute to formal instruction of Chemistry graduate students in modern mass spectrometry methods and engage in research collaborations with Chemistry faculty.



Scott Rosendahl



Randy Purves

Associate Faculty



Associate faculty **Graham George** received an Earned Doctor of Science degree at fall convocation in November 2019. Dr. George is a Canada Research Chair in X-ray Absorption Spectroscopy and a professor in the Department of Geological Sciences. Dr. George's groundbreaking research is noted for contributing to advances in multiple fields, from molecular toxicology and environmental science to fuel chemistry and bioinorganic chemistry.

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Alumna Wilma Elias Establishes Scholarship



Photo provided by Dr. Elias' family

Dr. Wilma Elias, chemistry alumna, passed away on May 1, 2018, at the age of 93. Through a planned gift in her will, Dr. Elias has established the Wilma E. Elias Scholarship for Women in Chemistry at USask. The bequest of \$540,000 will be endowed, providing long-term support for females studying chemistry—a fitting legacy for this distinguished alumna.

Dr. Elias was born in Calgary, Alberta, in 1925. Dr. Elias came to the University of Saskatchewan and completed her Bachelor's degree in chemistry in 1947, in the same class as another of our distinguished alumni, Robert Fuller. She stayed on in the department to pursue a Master's degree concentrating in organic chemistry with the now-world-famous carbohydrate chemist Dr. Raymond U. Lemieux. During this time, Dr. Lemieux moved to the Prairie Regional Laboratory of the National Research Council on the U of S campus. Dr. Elias completed her thesis on disubstituted glycolic aldehydes in 1950. She moved from

Saskatoon to the University of British Columbia in Vancouver. There she continued studying carbohydrates and natural products in the laboratory of Dr. L. D Hayward. In October 1956 she became the first woman ever to earn a PhD (in any subject) from UBC! Dr. Elias joined the faculty of Victoria College in 1958. In 1963, Victoria College merged with the Provincial Normal School to form the University of Victoria. Dr. Elias was a Professor of Chemistry at UVic until her retirement in 1985.

She remained active in the community in Victoria, with a love of the arts and travel, until her passing. In addition to her generous donation to USask, Dr. Elias also gave substantial donations to UBC and the University of Victoria to support women studying chemistry. Other donations went to her community to support seniors, volunteers and the Victoria Symphony.

Outreach





The Department of Chemistry had another great year helping with various outreach activities for both elementary and high school students. Several groups toured our facilities and were able to do some hands-on experiments in our labs in October through February.

Adrian Clark, Marcelo Sales, Stephen Foley, and Chris Phenix demonstrated what a career in chemistry is all about for hundreds of students in the ExperienceUS campaign in October. In addition, Dr. Clark held several tours of the analytical and physical chemistry labs in December for high school classes from Saskatoon. Students were enthralled with his charismatic demonstrations of dry ice and liquid nitrogen.

In the winter, **Alex Bartole-Scott** also prepared hands-on activities for a group of Grade 1-3 students and a Girl Guide unit. The Girl Guides learned about the scientific method and used their observations of chemical

reactions to design effective treatments of stains on fabric. The elementary students had a "blast" with elephant toothpaste, and watching their teachers light soap bubbles on fire on their hands!

Spring 2020 was expected to bring many students from around Saskatoon and other regions for the Nutrien Kamskénow program, and chemistry activities for the Museum of Natural Sciences Outreach program. We are sad that these outreach activities in our Department had to be cancelled this year, but we look forward to welcoming many smiling, budding young scientists to our labs in the future.



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Thee Prasertanan and supervisor David Palmer celebrating

Thee Prasertanan and PhD Examiners

The switch to remote instruction due to Covid-19 was a challenging one for faculty and staff. It also meant that PhD and MSc defenses had to be done completely remotely, which was a significant departure from normal, face-to-face defenses. The Department of Chemistry looked at a number of possible options for defenses, and settled on Zoom as the best option for defenses in late March, along with appropriate security in the wake of news of Zoom trolls hijacking defenses elsewhere.

Thee Prasertanan (Palmer/Sanders was the first to undergo his PhD defense and did a tremendous job. This was quickly followed by other excellent defenses by Kelly **Summers** (PhD, George/Pickering/Urquhart labs), Raymond Bennett (MSc, Kelly lab), and Sudheesh Veeranmaril (PhD, Scott lab). All of these students had to quickly learn how to effectively communicate on the remote platform, and work out methods of drawing molecular structures and equations in real time in order to answer questions from their committees during their defenses. The latter sometimes involved serious "MacGyver" efforts, including Raymond's infamous phone setup using two tomato cans and a few elastic bands (Raymond indicated that tomatoes were a personal choice and the can contents could be customized). Remote celebrations were held by groups after the defenses, and sometimes involved former graduates from across the globe.

Remote Defenses



Raymond Bennett and supervisor Tim Kelly with tomato can phone view



Raymond's creative phone setup

Prairie Environmental Chemistry Colloquium



Participants in the 2020 Prairie Environmental Chemistry Colloquium

The 2020 Prairie Environmental Chemistry Colloquium (PECC) was held virtually in May, hosted by the University of Saskatchewan, and organized by the **Kahan** group. A total of 35 undergraduate students, graduate students, and postdoctoral researchers (including nine people from the University of Saskatchewan Department of Chemistry) presented virtual posters related to environmental chemistry. Dr. Amila De Silva (Environment and Climate Change Canada) delivered the keynote talk on emerging organic contaminants of environmental concern, and joined Professors **David Palmer** (UofS Department of Chemistry) and Loleen Berdahl (UofS Department of Political Studies) in leading a career workshop for conference participants.

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CCC Executive 2019-20 Back (I to r): Jeveria Rehman, Stephen Awuku, Cory Zaparaniuk, Alfred Yeboah, Doug Fansher, Ahmad Salehi, Raymond Bennett, Rick Pettipas. Front (I to r): Naheda Sahtout, Natasha Vetter, Whitney Shannon, Maryam Alyari. Missing: Hillary Mehlhorn, Theo Olumorin, and Arthur Situm

Chemistry Course Council (CCC)

The CCC would like to thank everyone who has participated in and attended CCC events held within the last year. The CCC barbeque in September gave a warm welcome to our new graduate students arriving domestically and from abroad. Our holiday events, including the pumpkin carving and annual Christmas party, are always well received by both our graduate students as well as faculty and staff. The pumpkin carving event had several great pumpkins, as well as

one from the non-pumpkin variety. The Burgess Group's "pumpkin" was "carved" using photolithography and had to be viewed under a microscope. Attendance at the Bad

Movie Night was at an all-time high as many people came out to watch *The VelociPastor*; a movie which involves a "pastor inheriting a mysterious ability that allows him to turn into a dinosaur... and he uses this power to fight crime. And ninjas." Many other efforts were in the works, such as the J.M. Pepper Departmental Golf Tournament, but had to be postponed or cancelled because of the shutdown caused by the unprecedented Covid-19 outbreak.











Thorvaldson Water Aspirator Replacement Project



Doug Fansher

PhD student **Doug Fansher** (Palmer Group) initiated the Thorvaldson Water Aspirator Replacement project with the USask Office of Sustainability Revolving Fund in an effort to conserve thousands of litres of water, not only in his supervisor's research lab, but also throughout multiple labs in the Department of Chemistry. Water aspirators may cost as little as \$50 and are commonly used in research labs over other options like electronic diaphragm vacuum pumps, which can cost several thousand dollars. Funding for replacement of the water aspirators was approved by the Office of Sustainability and covered the purchase of 31 pumps at a cost of \$90,000. The replacement of 68 water aspirators in the department will result in a savings of 7.67 million litres of water and \$25,000 in utility costs per year. It is anticipated that the initial investment will pay for itself within five years.

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Award Recipients

Harold Ross Saddington Award (\$7,000 each)

Satavisha Bhattacharya (Müller Group)

Bahareh Vafakish (Urquhart Group)

Andy Luu (BSc student)

Robert A. Fuller Award (\$7,000)

Richard Granger (BSc student)

Patricia Currie Award (\$1,000)

Brianna Lukan (BSc Hon '20)

Thorvaldson Scholarship (\$800)

Grace Flaman (BSc Hon student)

Dean's Most Outstanding Gradute in Chemistry

Miranda Lavier (BSc Hon '20)

Dr. O. Kenneth Johannson Scholarship

William Barrett (MSc'20, Scott Group)

Braeden Dessert (PhD student, Foley Group)

Doug Fansher (PhD student, Palmer Group)

Tyler Morhart (PhD student, Burgess Group)

David Sowah-Kuma (PhD student, Paige Group)

Nataliya Zalatar (PhD student, Sanders Group)

2020 Graduate Students' Association Research Excellence in Science, Technology, Engineering or Math Award

Asghar Dolatkhah (PhD'19, PDF in Wilson Group)

2019 Stanford Synchrotron Radiation Lightsource/Linac Coherent Lightsource User's Meeting Outstanding Poster Award

> Kelly Summers (PhD student, George/ Pickering/Urguhart)

2019 Canadian Federation of University Women Bennee Scholarship

Amara Zuhaib (PhD student, Urguhart Group)

2020 TMS Annual Meeting & Exhibition in San Diego, CA, Graduate Student Poster Contest Winner for the Extraction & Processing Division

Arthur Situm (PhD student, Grosvenor Group)



Award Recipients Back (I to r): Andy Luu, Richard Granger, Department Head Matt Paige, Bahareh Vafakish. Front (I to r): Grace Flaman, Satavisha Bhattacharya

Award Winners





2020 Taube Medallist

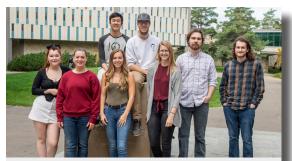
Dr. Hridaynath Bhattacharjee

The 2020 Taube Medal was awarded to **Hridaynath Bhattacharjee** who has completed his Ph.D. degree under the supervision of **Jens Müller**. Hriday's work has significantly increased the knowledge about boron-bridged ferrocenophanes, a class of strained monomers that can be transformed into metal-containing polymers.

Hriday grew-up in the small city of Durgapur in West Bengal. After graduating with a B.Sc. Honours degree in Chemistry (St. Xavier's College, University of Calcutta, Kolkata), he continued his education with an M.Sc. degree in Inorganic Chemistry (Jadavpur University, Kolkata) before joining the Müller group in 2012.

During the past three decades there has been an increasing interest in incorporating metals into polymers with the hope that properties can result that might become useful for future applications. Hriday's Ph.D. work aimed at increasing the knowledge about ferrocenophanes, a class of monomers where both Cp rings are bridged so that an intrinsic strain results. Hriday targeted highly strained boron-bridged ferrocenophanes as, at that time, only few examples were known and their polymerization led to insoluble materials. Hriday planned to overcome the solubility issue by applying a new synthetic approach that was developed in the Müller group by Saeid Sadeh (Ph.D. '14). A key component of this approach is the stereoselective introduction of alkyl groups on both Cp rings of the ferrocene moiety. This was the starting point of a very successful exploration and Hriday's results were published in four full articles and one short communication; in addition, he contributed to one review article. The highlight of his Ph.D. work is the preparation of unique bora[1] ferrocenophanes with sterically protected boron and the first evidence of polyferrocenes with a helical structure (Angew. Chem. Int. Ed. 2019, 58, 16575-16582).

In addition to being a very talented scientist, Hriday is an accomplished photographer. During his tenure at the U of S, he won awards for some of his pictures, including the one entitled "Colors of Chemistry" that was featured by *C&EN* (pictured above top right). Hriday is currently a postdoctoral fellow in Dr. Crudden's group at Queen's University.



CS2 Executive 2019-20 Back (I to r): Andy Luu, Llam Newman; Front (I to r): Kathleen Coyne, Grace Flaman, Dakota Penner, Abby Unrau, Jesse Selin, Mario Proulx

Chemistry Students' Society (CS2)

The Chemistry Students' Society had a great year filled with many events designed to engage our members. The Undergraduate Research Night was another success, providing student members with valuable information about researching at USask.

Members also had the opportunity to attend a movie night with the Biology club and pizza fundraisers at the beginning of the year.

Unfortunately, coronavirus cut our year together short, but the current executive would like to congratulate all the CS2 members who graduated this year and wish them all the best on their future endeavors!

Dr. Steven Langdon receiving the CS2 Outstanding Teacher Award from CS2 President Andy Luu We would also like to congratulate **Steven Langdon** for winning the student-elected Outstanding Teacher Award! His enthusiasm, humor, and knowledge were a great benefit to all of his students.



Undergraduate Celebration Night



On the evening of November 5th, the department hosted a pizza and pop celebration event to congratulate students who had excelled in their CHEM 112 midterm exam. About 60 students were welcomed by faculty and the Chemistry Students' Society in the Education Lounge. In addition to food and drinks, door prizes were handed out (our thanks to Nelson / W.N. Norton publishers who, along with the department, provided prizes). The event enabled us to showcase the department to this talented group of students, and it also gave them an opportunity to connect with each other. We wish them continued success.

Recent Graduates Fall 2019

Doctor of Philosophy

Mahla Alavi

Hridaynath Bhattacharjee

Naveen Diddi

Asghar Dolatkhah

Anindya Ganguly

Chintamani Thapa

Spring 2020

Bachelor of Science 4 Year

Christophe Gerard

Peter Homer

Aihua Li

Sidra Qayoom

Kassandra Schebel

Recent Graduates Spring 2020

Bachelor of Science Honours

Miranda Lavier

Brianna Lukan

Michael Nicklin

Jaskaran Sangha

Jarvis Stobbs

Master of Science

Akay Akohwarien

William Barrett

Raymond Bennett

Ning Chang

Brandon Chivers

Giovanni Donato

Doctor of Philosophy

Sheida Ahmadi

Kaiyang Tu

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First-year lab in Thorvaldson Building awaiting the return of students

Wilson and Florence Quail Fund in Chemistry

Wilson Quail was a faculty member in the



Department Chemistry for 39 years before retiring in 2003. He enjoyed this long career as an inorganic chemist and crystallographer, studying everything from metal fluorides proteins. He continued to work

as an emeritus professor in the Saskatchewan Structural Sciences Centre for over a decade, collaborating with researchers in the department. He and his wife Florence sent all their children to USask, cementing a strong relationship between the University and the Quail family. In 2017, Wilson and Florence agreed to a generous gift to the department, with the goal of helping new faculty with their research. In 2020, the funding committee agreed to award \$39,500 to **Amy Stevens** to enable funding for personnel and to provide her graduate students with computer equipment.

The department asks everyone to join us in thanking the Quails for their generosity and support of Chemistry. For information on how you can support research, teaching and student experience in the Department of Chemistry, please contact the Department Head.

Samuel and Ethel Brown Memorial Fund

Weldon G. Brown was born in Saskatoon in 1908 and completed both his bachelor's and master's degrees in chemistry at USask by age 20. After a PhD at the University of California and postdoctoral experience in Europe and America, Dr. Brown enjoyed a long career in the Department of Chemistry at the University of Chicago, where he became known for the invention of paper chromatography and pioneering work on lithium aluminum hydride reductions. Dr. Brown, as a distinguished alumnus from our institution, was presented with a Doctor of Laws degree by Dr. Thorbergur Thorvaldson at the University's Golden Jubilee Convocation ceremony in 1959.

Dr. Brown's family thanked his home department by establishing the Samuel and Ethel Brown Memorial Fund in honour of his parents. The fund is used to support special projects in the Department of Chemistry and has received generous ongoing support from Dr. Brown's son, Ross Brown.

In 2019-20, the Samuel and Ethel Brown Memorial Fund provided \$5,204.38 in financial support to allow 17 graduate students to travel to specialized conferences to report on their research. Conferences attended included:

- 102nd Canadian Chemistry Conference & Exhibition in Quebec City
- LOGIC Conference in Quebec City
- GlycoNet AGM and Symposium in Banff
- 14th International Symposium on Biocatalysis and Biotransformations in Groningen, Netherlands



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We're always interested in knowing what our alumni are up to! Please send updates to chem.dept@ usask.ca.

Make sure we have your current contact information to receive your college magazine or newsletter, the Green & White alumni magazine, event invitations, and information on special University of Saskatchewan alumni programs and offers. Go to http://alumni. usask.ca/connect/update_information/ to update your contact information.

We acknowledge that we live and work on Treaty 6 Territory and the Homeland of the Métis. We pay our respect to the First Nations and Métis ancestors of this place and reaffirm our relationship with one another.

- Canadian Society for Pharmaceutical Sciences Annual Meeting in Vancouver
- 18th International Symposium on Novel Aromatic Compounds in Sapporo, Japan
- 2019 Canadian Nuclear Society Annual Conference in Ottawa
- 26th North American Catalysis Society Meeting in Chicago

For emerging scientists, such conferences are vital for their career development. They gain confidence in their abilities, they start to build their network of international colleagues, and they return with exciting new ideas.

Retirement Goals



Professor Emeritus **Marek Majewski** enjoying the catch of the day!

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