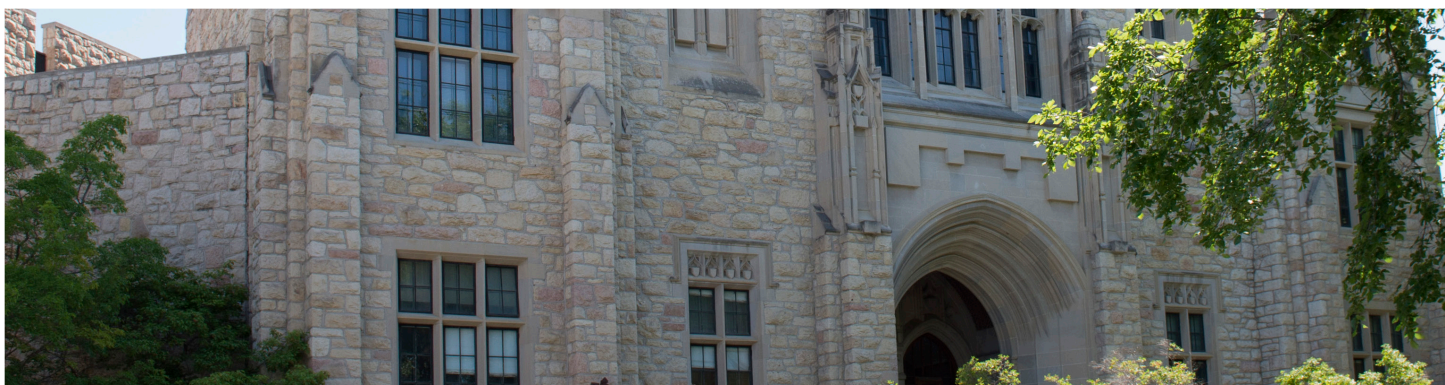


Department of Chemistry Newsletter



David Palmer
Department Head

Hello again to all students, staff, faculty, alumni and friends of Chemistry at the University of Saskatchewan. It is with mixed feelings that I write my last message to our chemistry community as Department Head. This has been a very rewarding position in many ways, and I have enjoyed representing and promoting all of the wonderful things our department does, in research, undergraduate and graduate teaching and training, in outreach to youth to engender an interest in science, and everything else we do. This is a great department, accomplishing a lot and capable of even more in the years to come. Being Department Head is also a lot of responsibility, and a lot of work; I will be happy to pass these responsibilities to our incoming Head, Professor Matthew Paige.

I could not have done this job without being surrounded by very capable people. I could always rely on the faculty to be committed to teaching and research in the department; we are a dedicated bunch! The laboratory teaching staff are absolutely wonderful, and do an incredible job of working with students in large and small courses. In my role in the Head's office, I have come to appreciate how effective our office support staff are. I was guided by the wisdom and experience of Ronda Duke and Brenda Weenk, who knew how everything was done. But many processes and regulations have changed in the past few years, and Brenda and Ronda retired, and I and the department were very fortunate to be able to find Bonita Wong and Erin Wasylow to step in. Erin has just finished her first year as the office coordinator, and has handled the new job incredibly well. Bonita has helped me navigate the over 200 financial funds for which we are responsible, along with all the building, furniture, personnel, and regulatory rigmarole that would baffle and bury me if I didn't have her help. I try to thank them all as often as I can, but it hasn't been enough. Thanks to everyone.

The greatest privilege of being department Head is leading the department through the hiring process, and I am so happy to have been able to bring Professors Tim Kelly, Eric Price, Chris Phenix, Tara Kahan, and now Amy Stevens to the University of Saskatchewan. And I was happy to help Tom Ellis with his move over from the Canadian Light Source, too! I also had a hand in hiring many staff, including Bonita, Leah Hildebrandt, Marcelo Sales, Adrian Clark, Linda Duxbury, and some new people you can read about. It's been an amazing nine years, and now Matt will get to enjoy the privilege.

The change in the Head's office is just one part of the transformation the department is experiencing right now. The department office staff this past year consisted of our office coordinator, Erin Wasylow, half-time clerical assistant Jessica Brown, and our graduate coordinator position was held first by Robyn Corcoran, and then Amber Bornhorst.

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Robyn is now working in Student Central, and Jessica has just found a full time position with the Department of History, so the parade of new faces will continue next year. The department also welcomed a new NMR and instrument technician, Kyle Fransishyn and a new storekeeper Felicity Lane. Finally, there were major changes in the department faculty. Our three longest-serving faculty members, Soledade Pedras, Steve Reid, and Dale Ward all retired this year, taking with them over 80 years of departmental experience. We also welcomed a brand new faculty member, Dr. Amy Stevens. You can read more about all these changes in the pages of this newsletter.

You will also read about a lot of success in these pages. Academic success, of course, from our outstanding students. Also research success, including new grants and a new Canada Research Chair for our faculty, and presentation awards won by trainees. There were successful outreach events here in Saskatoon and successful scientific events, including hosting meetings here on campus plus a national professional development symposium in Quebec City. It's an exciting time to be part of this department!

The University of Saskatchewan is about to embark on a major fundraising campaign, and you may be contacted about making a donation. The department is always in need of new equipment for teaching and research. We have scholarships for our top-achieving students, but many of our undergraduate and graduate students struggle to afford tuition. I would love our students to spend their time in laboratories instead of working off campus to afford school. The biggest loss of intellectual power from the chemical profession is the so-called "leaky pipeline" of women who leave advanced degrees or postdoctoral fellowships, especially due to a lack of childcare opportunities. Support for this in particular would help young chemists who are parents, and there are a lot of them. Please contact our department if you want to help chemistry students.

As always, I want to extend an invitation to all alumni to get in touch with us just to tell us what you are doing now. We would love to connect current students with graduates, so that they can benefit from the wisdom and experience of those who came before. We want to celebrate your success and inspire the next generation of chemistry students. We look forward to hearing from you.

Thank you to everyone who contributed to our department in any way, and all the best to you in the coming year.

Faculty Research News

Tara Kahan is the new Canada Research Chair in Analytical Environmental Chemistry. As a Tier 2 CRC, which is awarded to excellent emerging researchers who have been recognized by their peers as having potential to lead in their field, Dr. Kahan will receive \$120,000 per year for five years. Her research involves environmental pollutants in snow and ice, as well as indoor air quality. Dr. Kahan also received a grant from the Alfred P. Sloan Foundation for \$1,000,000 to support her research on indoor chemistry to improve understanding of the role chemistry plays in determining air quality in houses and other indoor environments.

After this year's NSERC competition, Discovery Grants were awarded to five faculty--a 100% success rate! Receiving grants are **Ian Burgess, Richard Bowles, Tara Kahan, Matthew Paige, and Ron Steer**. Two NSERC Research Tools and Instruments Grants led by **Tim Kelly** and **Matthew Paige** were also successful.

Faculty Research News



Eric Price (Photo Credit: Debra Marshall for SHRF)

Eric Price was awarded a \$120,000 Establishment Grant from the Saskatchewan Health Research Foundation (SHRF) to support his research in developing novel radiopharmaceuticals that are more effective and have fewer negative side effects. Price and his research team are attempting to insert a new chemical linkage into the radioactive peptide agent currently used in cancer detection that aims to block and reduce high kidney uptake. Dr. Price's grant was recognized as the top SHRF Biomedical Research Establishment Grant of 2018.

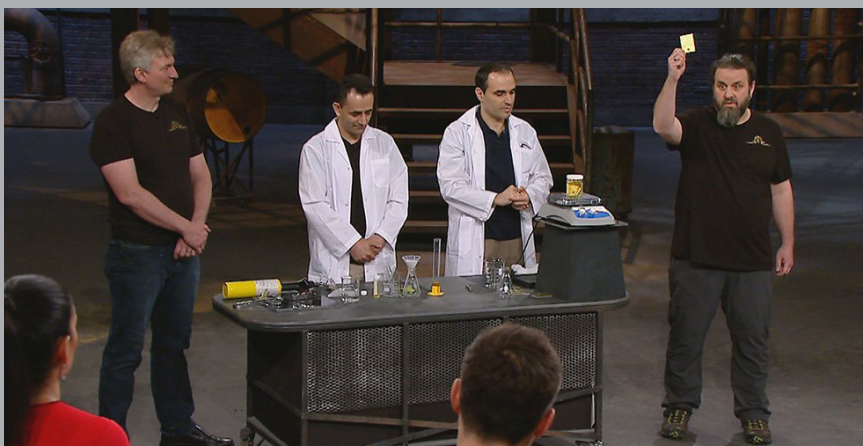
Faculty News

Stephen Foley appeared on CBC's *Dragons' Den* with his team from start-up venture Excir Works and secured a \$1,000,000 investment for their innovative method of extracting gold from electronic waste. The team includes Dr. Foley's former graduate students **Hiwa Salimi (PhD '18)** and **Loghman Moradi**.

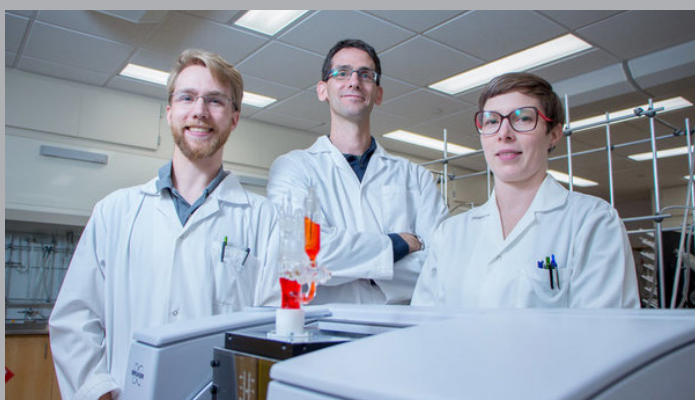
Dragons' Den provides opportunities for aspiring Canadian entrepreneurs to pitch their business ideas to a panel of venture capitalists in the hope of securing business financing and partnerships. The team's pitch was impressive enough to persuade all six dragons to chip in on the million dollar investment.

Excir Works uses an innovative, cheap, and environmentally benign solvent that Dr. Foley's laboratory team developed in 2016 to rapidly and selectively extract thin layers of gold from circuit boards and other hardware components in electronic waste.

Based on scaling up lab results, it is anticipated that 100 litres of the recyclable solvent can process up to five tonnes of e-waste at a cost of \$200, yielding about a kilogram of gold worth \$50,000. The new technology is expected to replace standard recovery and recycling methods that use toxic chemicals and heat.



Left to right: Graham Fritz, Loghman Moradi, Hiwa Salimi, Stephen Foley (Photo Credit: CBC)



Left to right: Tyler Morhart, Ian Burgess, Jessica Sigrist (Photo Credit: Chris Putnam)

Ian Burgess and PhD students **Jessica Sigrist** and **Tyler Morhart** have co-founded Jackfish SEC Manufacturing to bring to market a product called a spectrochemical (SEC) cell. SEC cells are needed for the research technique known as ATR-SEIRAS, a non-destructive way of studying chemical processes on the surfaces of metals using light. It is a valuable method in the field of electrochemistry, with applications in consumer electronics, next-generation energy solutions, medical diagnostics and other areas. Previously, no manufacturer of scientific instruments offered an off-the-shelf solution for this technique.

The team worked closely with the Department of Chemistry's on-site scientific glassblower **Rick Elvin**, along with machinists in the Department of Physics Machine Shop, to refine the SEC cell over several years.

Jackfish SEC is now actively producing SEC cells for PIKE Technologies. The cells are manufactured in small batches on campus and have been sold to researchers in Asia, Europe, and the United States.

New Faculty



We are excited to announce that **Amy Stevens** will be joining our department July 1, 2019, as an Assistant Professor.

Dr. Stevens obtained her BA with Honours in Physics from Trinity College Dublin and her DPhil (PhD) in Physics from the University of Oxford.

She has previously held Postdoctoral Fellowships in the groups of Prof. R.J. Dwayne Miller at the Max Planck Institute for Structural Dynamics in Hamburg, in the Chemistry Department at the University of Toronto, as well as within our own Department under the guidance of **Matthew Paige** and **Ron Steer**.

Dr. Stevens will use ultrafast optical spectroscopy techniques to probe the excited-state properties of molecules. She is interested in molecules that can undergo exotic energy transfer processes, such as non-coherent upconversion or exciton fission, and need favourable intermolecular interactions for those processes to be efficient. She aims to unlock their biomimetic potential by integrating them into DNA nanostructures.

Associate Faculty



Associate faculty member **Graham George** (Department of Geological Sciences) received the 2018 Farrel W. Lytle Award for his outstanding contributions to synchrotron science at the SLAC National Accelerator Laboratory.

The award, established by the Stanford Synchrotron Radiation Lightsource Users' (SSRL) Executive Committee, promotes technical or scientific accomplishments in synchrotron radiation-based science.

Dr. George is a Canada Research Chair in X-ray Absorption Spectroscopy (XAS) and was elected a Fellow of the Mathematical and Physical Sciences Division of the Royal Society of Canada in 2016. He has been an Associate Faculty member in the Department of Chemistry since 2013.

Faculty Milestones

Four faculty members have reached milestones in our department:



David Palmer
20 years



Stephen Foley
15 years



Lee Wilson
15 years



Andrew Grosvenor
10 years



Tim Kelly and his wife Amy celebrated the birth of their first child, Jack, on December 7, 2018. Congratulations Tim and Amy!

Associate Faculty

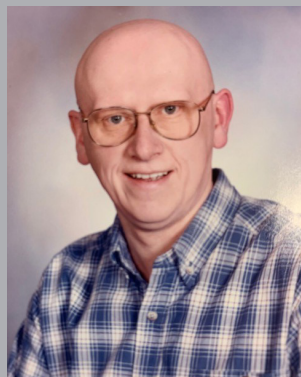


Associate faculty member **Ingrid Pickering** (Department of Geological Sciences) was appointed chair of the board of directors at the Canada Foundation for Innovation (CFI). Dr. Pickering is a Canada Research Chair in Molecular Environmental Science and is the first woman to be appointed chair of the CFI board. Dr. Pickering was also appointed for a 12-month term as acting Vice-Dean Research, Scholarly and Artistic Work.

In addition to these prestigious appointments, Dr. Pickering received the Saskatchewan Health Research Foundation 2018 Achievement Award and was named a fellow of the Royal Society of Canada.

Faculty Retirements

This year saw the retirement of three long-standing faculty members.



After a 34-year career in the Department of Chemistry, our friend and colleague Professor Steve Reid retired as of December 2018. Professor Reid completed a BSc from the University of Edinburgh, an MSc from the University of Warwick and a PhD from the University of Alberta. After a brief stint as an industrial research chemist at Dow Chemical, he joined the faculty at the University of Saskatchewan in 1984. Steve made many important research contributions to the field of metal speciation and metal-amino acid interactions and was a key player in developing the Department's suite of NMR spectrometers. He was an accomplished and respected teacher, was the anchor of the analytical chemistry program throughout his career, and was an influential figure in the University's teaching mandate. Steve plans on spending his retirement pursuing his passion for hiking, camping and the outdoors and has reportedly got great use out of his retirement gift, a high-end tent from Mountain Equipment Co-op. Steve is greatly missed, but we wish him all the best for a happy and healthy retirement.

Professor Soledade Pedras retired from active teaching and other formal duties, as of June 30, 2019. Professor Pedras received her early university training at the University of Porto, Portugal, and in 1986 obtained her PhD with Prof. Bill Ayer at the University of Alberta. She was subsequently appointed as Visiting Fellow, then staff Researcher, at the National Research Council's Plant Biotechnology Institute in Saskatoon. In 1994 she accepted a tenure-track appointment in our Department, quickly rising through the ranks to Professor. In 2004 she was appointed as Tier I Canada Research Chair in Bioorganic and Agricultural Chemistry, a position that she relinquished in 2018. Under her mentorship the U of S has developed a strong reputation for research in determining the chemical identities and operational mechanisms of plant pathogens and their natural biochemical defences. As a result, she has received much-deserved recognition from the University for excellence in both teaching (USSU Teaching Award, 1994-95) and research (earned DSc, 2011; Distinguished Researcher Award, 2009). She won the Clara Benson Award (2003) from the Canadian Society for Chemistry, recognizing outstanding contributions to chemistry by a woman in Canada.



After 34 years in the Department, Professor Dale Ward retired as of June 30, 2019. Professor Ward obtained both his BSc and PhD in Chemistry at the University of Alberta, where he too studied with Bill Ayer. In 1979 he accepted an NSERC Postdoctoral Fellowship to work with Nobel Laureate R. B. Woodward at Harvard University, where he was coauthor of three JACS papers that described a monumental effort resulting in the asymmetric total synthesis of erythromycin. Following a subsequent term as Research Associate at his alma mater, he accepted a tenure-track appointment in our Department. Prof. Ward has earned a well-deserved reputation for excellence in organic synthesis research and particularly for setting and achieving high standards for himself and his students. He has left an indelible imprint on the Department's teaching of organic chemistry, and in 2006 received the University's Outstanding Graduate Supervisor Award. Prof. Ward has also contributed generously to the Department's and the University's collegial and oversight work, including serving a term as Director of the Saskatchewan Structural Sciences Centre. He has been a member

and has chaired NSERC's Organic and Inorganic Chemistry Grants Selection Committee and has served frequently as an external referee and reviewer.

The outstanding contributions of both Soledade Pedras and Dale Ward to teaching and research in bioorganic and synthetic organic chemistry will be long-remembered and sorely missed. We look forward to their continued contributions to our Department as Professors Emeriti in the years to come.

Faculty News



A special issue of the Canadian Journal of Chemistry was dedicated to Professor Emeritus **Ron Steer**, with special guest editors, **Matthew Paige** and **David Palmer**. The issue featured an article by Dr. Steer titled "Personal reflections on 50 years of funding via the Canadian academic research grant system".

Staff Teaching Award



Undergraduate Lab Manager **Adrian Clark** received a 2018-19 USSU Teaching Excellence Award. In 2018, Dr. Clark taught the inaugural offering of Chemistry 100 Problem Solving Foundations for University Chemistry.

New Staff

The Department of Chemistry welcomed four new staff over the last year.



Amber Bornhorst joined the department as *Administrative Coordinator* to handle administration of the graduate program. Amber previously worked at the University Bookstore for six years.

Following his successful MSc defence in August 2018, **Kyle Fransishyn** assumed the role of *Instrument Technician*, in which he divides his time between maintenance, repair and upgrading of lab equipment for the Department of Chemistry and providing technical support for the NMR facilities in the Saskatchewan Structural Sciences Centre.

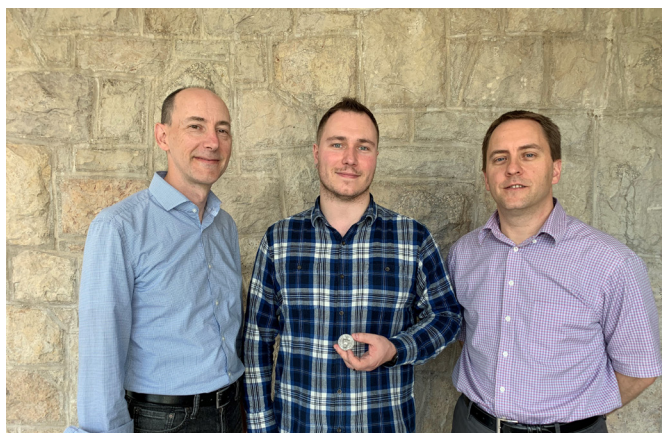


Felicity Lane is our new *Junior Storekeeper* in Chemistry Stores. Felicity previously worked in Dentistry Stores for 11 years.

Erin Wasylow moved from a Clerical Assistant position in our Department to *Office Coordinator*, in which she provides administrative support to the Department and to the undergraduate program. Prior to joining Chemistry, Erin worked on campus at the Sylvia Fedoruk Centre and in Research Services.



2019 Taube Medalist - Dr. Steven Langdon



Left to right: D. Palmer, S. Langdon, M. Gravel

The 2019 Taube Medal was awarded to **Steven Langdon** who has recently completed his Ph.D. degree under the supervision of **Michel Gravel**. Steven's work has significantly increased the scope and mechanistic understanding of the benzoin reaction, one of the earliest discovered reactions in organic chemistry.

Steven was first successful in discovering a new and readily available catalyst capable of forming one benzoin product from the coupling of two different aldehydes. This had represented a great challenge up to that point, as this type of coupling typically resulted in a statistical mixture of all four possible benzoin products. The chemoselectivity observed in reactions involving his new catalyst allowed the union of an aromatic and an aliphatic aldehyde in high yield and in a predictable manner.

Following this discovery, he performed computational and mechanistic studies to uncover the factors controlling the chemoselectivity of this reaction. These studies underscored the fine balance that is possible to

achieve between thermodynamic and kinetic control. His rigorous work resulted in the most comprehensive mechanistic study of this nearly 200 year-old reaction, along with an increased ability to rationalize and predict its outcome.

Steven then worked on another mechanistic study that aimed to elucidate the role of the counter-ion in the azolium salts that are used as catalysts in benzoin reactions. Conventional wisdom has been that the counter-ion plays no significant role but in fact, he showed it measurably influences the rate of the reaction. Along the way, he developed a new synthetic procedure to access catalysts bearing different counter-ions.

His work on the benzoin reaction has spawned other projects in the Gravel group and has influenced researchers elsewhere. His findings could find application in the synthesis of complex molecules such as pharmaceutical ingredients and agrochemicals.

2018-19 Award Recipients

Recipients of the Dr. O. Kenneth Johansson Scholarship for exceptional performance as Teaching Assistants:

Osai Clarke (PhD student, Burgess Group)
Anindya Ganguly (PhD student, Kelly Group)
Sarah McCaugherty (MSc '18, Grosvenor Group)
Tyler Morhart (PhD student, Burgess Group)

Annastacia Stubbs (PhD student, Kahan Group) received 2nd place for Outstanding Graduate Student Presentation at the Prairie Environmental Chemistry Colloquium, held at the University of Alberta.

Sarah McCaugherty (MSc '18, Grosvenor Group) was awarded a 2019 U of S MSc Thesis Award for the physical and engineering sciences.

Chase Radford (PhD student, Kelly Group) received a *Materials Horizons* Poster Prize at the 14th International Symposium on Functional π -Electron Systems in Berlin, Germany.

Mohadeseh Majdi Yazdi (PhD student, Palmer & Sanders Groups) won the Best Poster Award at the 2019 Annual Symposium of the Canadian Society for Pharmaceutical Sciences.

2018-19 Award Recipients



Top Row, L to R: I. Andvaag, G. Donato, C. Radford, D. Palmer (Head).
 Bottom Row, L to R: M. Lavier, R. Bennett, N. Vetter

Harold Ross Saddington Award (\$7000 each)

Raymond Bennett (MSc student, Kelly Group)
Giovanni Donato (MSc student, Grosvenor Group)
Chase Radford (PhD student, Kelly Group)

Robert A. Fuller Award (\$7000)

Miranda Lavier

Herzberg Fellowship (\$5000)

Natasha Vetter (PhD student, Palmer Group)

Thorvaldson Scholarship (\$800) and Most Outstanding Graduate in Chemistry, Spring Convocation

Ian Andvaag (BSc Hon '19)

Chemistry Students' Society (CS2) Update



CS2 Executive: K. Coyne (President), M. Zhao, A. Luu, J. Stobbs, M. Lavier, D. MacDonald, J. Selin, G. O'Byrne, F. Ojukwu, A. Unrau

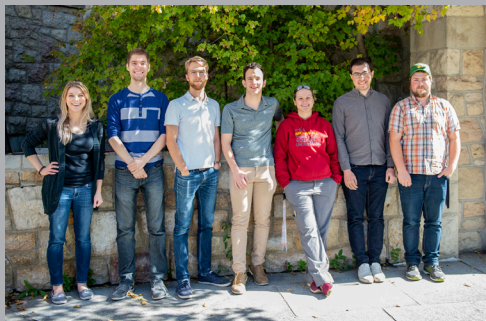
The Chemistry Student Society had a great year filled with many academic and social events for our members. Our Undergraduate Research Night was another success, as our Department gained multiple summer researchers from the event. Our members also had the opportunity to attend our Beer and Burger Night, our Bowling night, and our annual Trivia night and win fantastic prizes. The current executive would like to congratulate all CS2 members who graduated this year and wish them all the best on their future endeavors.

We would also like to congratulate Professor **Chris Phenix** for winning the student-elected Outstanding Teacher Award! His humour, accessibility, and kindness was greatly appreciated by all his students.

Chemistry Course Council (CCC) Update

Thanks to everyone who participated over the last year in our CCC events. This year we hosted our biannual graduate student symposium, for which the CCC is grateful to those who volunteered to help set-up and chair sessions. Special thanks to our graduate student symposium speakers (see page 10 for more information).

Holiday events continue to resonate well with our students and staff featuring our annual holiday social and pumpkin carving contest. In addition to our regular events, such as our welcome barbeque, movie night, and professional development days, we introduced a mental health event this year. We would like to thank our speakers Rita Hanoski (Student Wellness Centre), Murray Drew (College of Agriculture and Bioresources), and Ryan Bilanski (Student Affairs and Outreach) for their guidance on managing stress and keeping mentally fit in graduate school.



CCC Executive (L to R): W. Shannon, A. Situm, T. Morhart, R. Pettipas (Co-President), N. Vetter (Co-President), R. Bennett, D. Fansher. Missing: W. Barrett, B. Chivers, J. Sigrist

Finally, the CCC would like to thank USask-Women in Chemistry for their donations toward the holiday social and symposium, and we hope we can continue to support each other in the coming year. Enjoy the summer!

Recent Graduates

Fall 2018

Bachelor of Science
3 Year
Tiancheng Li

Bachelor of Science
4 Year
Joshua Gramlich
Bruno Villeda-Prieto

Master of Science
Kyle Fransishyn
Sarah McCaugherty
Rahin Sifat

Doctor of Philosophy
Leila Dehabadi
Steven Langdon

Spring 2018

Bachelor of Science
3 Year
Colton Hope

Bachelor of Science
4 Year
Megan Flaman
Shawn Hood
Kellen Low
Shane Pooler
Katelyn Thompson
Cory Zapanianuk

Bachelor of Science
Honours
Ian Andvaag

Master of Science
Tram Truong
Derek Zomerman

Doctor of Philosophy
Sushital Jana
Sahan Neelakanni

Women in Chemistry

The University of Saskatchewan-Women in Chemistry (USask-WiC) group is comprised of enthusiastic young scientists, ranging from undergraduate and graduate students to postdoctoral fellows and faculty members, currently studying or working in science, technology, engineering, and mathematics (STEM) fields. They support women and underrepresented groups by initiating open discussions and showcasing strong role models for women through lectureship series and panel dialogues. USask-WiC also provides career building and networking opportunities through professional development workshops and social events. Due to their membership in the Canadian Women in Chemistry (CWIC) Network and recent high-profile events, they are actively increasing the pool of resources and promoting advocacy for the success of women and gender minorities.



L to R: Minister Kirsty Duncan, Minister Maryam Monsef, and USask-WiC Chair Elaheh Khozeimeh Sarbisheh
(Photo Credit: U of S)

A major highlight of the past year was hosting a conversation about “Women Leading” with Minister Maryam Monsef and Minister Kirsty Duncan. USask-WiC also participated in USask’s Open House, which hosted more than 9,000 high school students and aimed to spark the interest of young women in STEM at the earliest age. Graduate student **Josseline Ramos-Figueroa** led a USask-WiC event to celebrate the International Year of the Periodic Table, which featured presentations by **Michel Gravel**, **Ron Steer**, and Michael Bradley (Department of Physics and Engineering Physics).

The group successfully organized the 3rd annual retreat Leaders Overcoming Gender Inequality in Chemistry (LOGIC). This was a two-day satellite meeting in partnership with the 102nd Canadian Chemistry Conference and Exhibition (CCCE) in Quebec City. The meeting included plenary lectures and workshops delivered to about 80 attendees, all with the aim of providing professional development and networking opportunities to women in the chemical sciences across Canada while conversing on issues about gender disparity. Every year, LOGIC calls for a focal theme to be addressed; this year’s theme was “Women Leading and Excelling”.

USask-WiC’s effort on filling the gap for underrepresented groups did not go unnoticed--the group was awarded the Canadian Society for Chemistry Student Chapter Merit Award.

USask-WiC is undergoing a turnover and calling for nominations for the executive team. For more information please contact womeninchemsask@gmail.com.



Some of the dedicated members of the USask-WiC group

Western Canadian Medicinal Chemistry Workshop

The Department of Chemistry and the College of Pharmacy and Nutrition co-hosted the 6th Western Canadian Medicinal Chemistry Workshop September 21 - 23, 2018, organized by **Ed Krol** and **David Palmer**. The goal of WC-MCW is to bring researchers and trainees in the chemical, pharmaceutical, and related sciences together to discuss their work and build new relationships.

The symposium was sponsored by the Saskatchewan Health Research Foundation, the Biological and Medicinal Chemistry Division of the Canadian Society for Chemistry, GlaxoSmithKline, the University of Saskatchewan, VWR, ThermoFisher, the Canadian Journal of Chemistry, Aurora, and Inception Sciences. The meeting featured six invited speakers from across western Canada: Rebecca Davis (Manitoba), Kate Dadachova (Saskatchewan), Katherine Maloney (Northern Vine Labs), Darren Derksen (Calgary), Tim Storr (SFU), and Florence Williams (Alberta), as well as student and trainee oral and poster presentations.

There were two awards for outstanding oral presentations and six awards for outstanding poster presentations. Among these winners for best presentations were five students from our own department.



L to R: S.Tabatabaei Dakhili (Alberta) - ThermoFisher Award; M. Majdi Yazdi (Sask) - Can. J. Chem Award; GSK Awards: T. Prasertanan (Sask), M.Dominguez Garcia (Sask), F. Deuna (Winnipeg), S. Saran (Sask), O. Aigbogun (Sask), D. Perez (Alberta)

XRM 2018 Conference

The 14th International Conference on X-ray Microscopy (XRM2018) was hosted by the University of Saskatchewan August 19 - 24, 2018, and chaired by **Stephen Urquhart**.

A total of 310 people from more than 24 countries gathered for this conference, which highlighted the development of new instruments



as well as the application of X-ray microscopy to the fields of biology, physics, and materials chemistry.

The field of X-ray microscopy is closely tied to development of new X-ray sources. A pre-conference workshop organized by Chris Jacobsen (Argonne Lab and Northwest University) and Mark Boland (Canadian Light Source) explored prospects for X-ray microscopy with next generation storage rings. These ideas will help pave the way for an upgrade of the Canadian Light Source, to CLS-II.

Conference attendees visited the X-ray beamlines at the CLS on the last day of the event, with a highlight being the recently commissioned soft X-ray cryo-Scanning Transmission X-ray Microscope.

Special thanks to the conference volunteers, which included many chemistry graduate students, Adam Hitchcock of McMaster University, the program committee, and the conference organizing firm, Venue West.

3rd Graduate Student Symposium



L to R: M. Dominguez Garcia, D. Fansher, R. Pettipas, F. Williams (U of A)

The 3rd Graduate Student Symposium was held May 16-17, 2019, organized by graduate students **Doug Fansher** and **Rick Pettipas**. The purpose of the symposium was to promote networking among chemists in the greater Saskatoon area and to provide graduate students with insight into the chemical industry, and about 65 people attended. A mixer was introduced this year, which provided students the opportunity to meet the visiting speakers in a casual setting. Invited speakers were Florence Williams (University of Alberta), Jeff Zimmer, (Sask. Research Council), and Murray Schultz (Mosaic).

Chemistry Outreach Activities

The department continues to be actively involved in chemistry outreach activities. Making connections with students and the community, sparking interest in science, and improving the general understanding of the importance of chemistry in our everyday lives are but a few of the positive outcomes from these efforts, which are accomplished only as a result of the hard work of many faculty and staff and students in the department working on a volunteer basis off the side of their desks.



Bishop James Mahoney high school offers a specialized Health & Sciences Academy for students who are particularly interested in the health and science fields and want to have more direct hands-on experiences and be challenged in their learning. They partner with a number of external organizations to give their students richer hands-on learning experiences. Over the past three years, **Eric Price** has visited Janelle Franko and her science classes to give lectures explaining fundamentals about radiochemistry research and nuclear medicine, including examples from his own research program. During a visit to the Saskatchewan Centre for Cyclotron Sciences (operated by the Fedoruk Centre), the students received a detailed tour of the cyclotron research facility. This was an interactive tour where students

partook in several experiments, one of which was focused on radioactive sugar “FDG”, which contains fluorine-18 and is used daily at Royal University Hospital for positron emission tomography (PET) imaging of cancer patients. After BJM’s analytical glassware mysteriously disappeared, Ms. Franko’s Chemistry 30 students also came to the analytical labs in May to learn basic volumetric glassware techniques, and then used those new skills to determine the citric acid content in assorted juices.

The department serves as a destination for many elementary school field trips. In April this year, we again participated in the Kamskénow field trips, hosting ten different grade 4-5 elementary school groups. This program, which is offered by A&S Science Outreach, provides hands-on science and math activities for 90 minutes a week over a period of 13 weeks to Saskatoon Community School classrooms. The program culminates in a trip to the University where students participate activities in labs on campus and can hear from faculty about the work they do.

The Museum of Natural Sciences on campus also hosts field trips in May and June for elementary and high school students in Saskatoon. They offer a variety of sessions from Geometric Optics to DNA Extraction. Lab Managers **Valerie MacKenzie** and **Adrian Clark** hosted a Cool Chemistry session aimed at grade 4-6 students. This session is extremely popular with teachers and typically books up within an hour of the registration opening! We had eight classes come through the department for two hours each. We explore the nature of hydrophobic and hydrophilic materials, perform some fun reactions, and always conclude with a demonstration of the very cool properties of dry ice and liquid nitrogen.

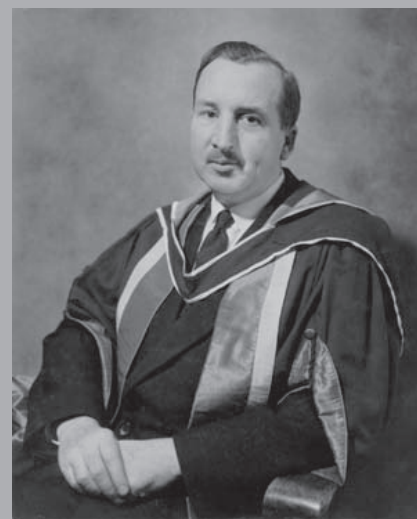


A new one-time opportunity arose this year when the department was approached by Responsible Distribution Canada and Clear Tech Industries to ask if we would be willing to host their day-long You Be the Chemist® challenge event for grade 7 & 8 students. A total of 26 students from a variety of schools came to campus for a day in April. They participated in four 20-minute knock-out round style chemistry quizzes interspersed with a welcome guest lecture by Professor Emeritus **Ron Steer**, in-lab hands-on chemistry activities led by postdoctoral fellow **Elaheh Kozeimeh Sarbisheh** and the Women in Chemistry group, and a spectacular fire and energy demonstration by graduate student **Doug Fansher**. It was a very busy but fun and educational day.

2019 J.W.T. Spinks Lectures

The J.W.T. Spinks Lectures are a series of annual lectures that were established in 1975 to recognize the many contributions Dr. John Spinks made to his department, the University, and the chemical professions, both nationally and internationally. As faculty member, Department Head, Dean of the College of Graduate Studies and Research, University President, and President Emeritus, Dr. Spinks was associated with our University from 1930 until his passing in 1997.

The lecture series brings to the University of Saskatchewan eminent scientists and engineers in the fields of chemistry and chemical engineering to deliver a series of lectures and to share their knowledge and experience with students and staff. This series is run jointly with the Department of Chemical Engineering, which hosts the Spinks lectures every third year.



The 2018-2019 Spinks Lecturer was **Dr. Chris Chang** from the University of California, Berkeley and the Lawrence Berkeley National Laboratory. Dr. Chang presented two lectures on April 25th and 26th. The first lecture described his pioneering work on the development of activity-based probes that act as sensors to detect transition metals, reactive sulfur, oxygen and carbon species in cell, tissue, zebrafish, and mouse models. Dr. Chang is using these innovative chemical biology tools, discovered in his lab, to help understand normal cell function as well as various disease processes.

The second lecture titled "Bringing Chemistry to Life: The Unending Search for Elemental Harmony" was accessible to a general audience and celebrated the 150th year of the periodic table. Dr. Chang described the contributions and future opportunities in the chemistry of metals with a focus on health, energy, and the environment emphasizing a chemical blueprint for organizing the elements of life.

During his visit, Dr. Chang met with various faculty and students and toured the new cyclotron facility. The department enjoyed Dr. Chang's lectures and meeting with him one-on-one. Dr. Chang commented that he had a great time during his visit and remarked about the fun discussions he held with the graduate students.



Dr. Chris Chang with
Department Head David Palmer

In Memoriam



Audrey (left) and Erma Cameron
Photo Credit: University of Saskatchewan

This year we learned of the passing of two alumnae of our department, **Audrey and Erma Cameron**. Audrey and Erma were twin sisters, who graduated from our department in 1966. They were born in Saskatoon, grew up in Weyburn, and had fond memories of their time there and with family near Macrorie.

After graduating, Audrey went on to a PhD at McMaster University, and then pursued a career with the American Chemical Society's Chemical Abstracts Service (now known as CAS) in Columbus, Ohio, beginning in 1971, where she worked the rest of her career and spent many happy years with her partner, Dr. Harry Hershey, professor emeritus of chemical engineering at the Ohio State University.

Erma completed a Master's degree in biochemistry at the University of California, Davis, then worked for Abbott Labs in the Chicago area, for Miles Laboratories in Elkhart Indiana, and for IBM's chip making facility in Manassas, Virginia. She then pursued a career with the US patent office in Alexandria, Virginia, where she was recognized as an expert in organic chemistry. She loved her job, won several awards for her service, and continued working right up to her death.

Both Audrey and Erma loved the outdoors and sports, particularly skiing, and both were world travellers. Though both became American citizens, they remained proud of everything Canadian, and proximity allowed Erma to attend many events at the Canadian Embassy in Washington.

Audrey died March 22, 2017, and Erma died December 9, 2018.

In Memoriam

Wilma E. Elias was born in Calgary, Alberta, in 1925. Her mother had been a school teacher, perhaps inspiring a love of learning. 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. Wilma 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 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 until her passing in May 2018 at the age of 93.



Wilma Elias
Photo Credit: University of Victoria

The Samuel and Ethel Brown Memorial Fund for Chemistry

Weldon G. Brown was born in Saskatoon in 1908 and completed both his bachelor's and master's degrees in chemistry at the U of S by age twenty. 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. T. Thorvaldson at the U of S Golden Jubilee Convocation ceremony in 1959.

Dr. Brown 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 children.

The Samuel and Ethel Brown Memorial Fund provided \$13,740.54 in financial support in 2018-19 to support 40 graduate students, two undergraduate students, and one postdoctoral fellow to travel to specialized conferences to report on their research. Conferences attended included the 101st Canadian Chemistry Conference and Exhibition in Edmonton; the 32nd Annual Protein Society Symposium in Boston; the GlycoNet 2018 AGM and Symposium in Banff; and the LOGIC Workshop in Quebec City.

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.

We would love to hear your feedback about our newsletter.
Please email chem.dept@usask.ca.

Wilson and Florence Quail Fund in Chemistry



Wilson Quail was a faculty member in the Department of Chemistry for 39 years before retiring in 2003. He enjoyed this long career as an inorganic chemist and crystallographer, studying everything from metal fluorides to 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 the U of S, 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 2018-19 the funding committee agreed to award \$32,000 to **Tara Kahan** to help support a postdoctoral fellow, and \$8000 to **Eric Price** for research 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.



Instructor **Keith Brown** retired from the Chemistry Department in 2018, but he has clearly been on the mind of at least one former student. Akinwande Akingbehin presented his favourite instructor with an original painting, a testament to Dr. Brown's lasting impression!



Staying Connected



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.