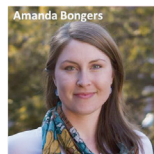
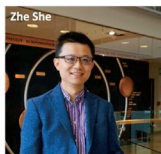
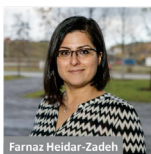


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CHRONICLES ANNUAL AUGUST 2019

A Chemical Shift: a new generation of chemists engages



One of the oldest chemistry departments in Canada is quickly becoming one of the youngest!

Three new assistant professors joined us in 2018 and another three will start in 2019. Queen's Chemistry is well on its way to being the youngest, most diverse, and most engaging place to study and research chemistry in Canada.

In July 2018 we welcomed assistant professors Chantelle Capicciotti, Peng Wang and Zhe She into our department. Chantelle is our 9th Queen's National Scholar and is jointly appointed with the Department of Biomedical and Molecular Sciences. Her research on carbohydrate chemistry is already well supported and she is quickly building a sizable research team. Peng is a member of the *Arthur B. McDonald Canadian Astroparticle Physics Research Institute* and its only chemist. His work on solid state scintillator materials will advance the particle detectors required to extract ever more information on the nature of dark matter. As an (electro)analytical chemist Zhe has been able to establish relationships (and obtain funding!) from the Department of National Defence and has also been able

to grow his group and furnish his lab. In 2019 these three assistant professors will be joined by three more assistant professors: Amanda Bongers' research in Chemistry Education will help us transform our delivery of postgraduate chemistry knowledge and contribute to the growing body of work at the interface of education research and the natural sciences. Farnaz Heidar-Zadeh will be using machine-learning methods and other advances in computational chemistry to create the next generation of computational tools for theoretical and experimental chemists alike. She has already launched a widely used software tool for computational chemists. Physical-organic chemist Graeme Howe completes the 2019 roster; he studies enzyme kinetics using (bio) chemical experimental studies supported by computations. By the end of 2019 more than a third of our faculty will be at the level of assistant professor – and exactly one-half of them are women.

We are very proud that these six young scientists have decided to join our department and extend a warm welcome to all of them. Welcome on board, your journey will begin right away...



Message from the Head

Greetings, Alumni & Friends

Hello friends and alumni of Queen's Chemistry. As another academic year wraps up and a new group of chemistry graduates is released into the wild, it is a good time to reflect on our accomplishments of the last year.

To a large extent we have been able to deliver on our promise to grow our department through new academic hires, growth of our undergraduate programs and attraction of new research funds that allowed us to branch into new areas of research. You have read a brief description of our six new faculty hires on the front page. Needless to say, that we are all very excited to welcome them into our department and have high expectations as to where their research will take us. Hiring the right people is the most transformative initiative one can undertake to change a department's direction, and I am very grateful to the members of the Academic Appointment Committee who spent many hours reading the 500+ applications, to the office staff for sorting the applications and organizing the visits, and to all departmental members for their input during and after the interviews. Students had a large role in deciding on the final candidates and always brought a unique perspective to the interview process.

You may have noticed that our graduating pictures are getting more and more crowded each year. This is not just in your imagination – our undergraduate enrollment has indeed been increasing from about 25 students in the 2015 graduating class to 39 in 2018. For 2019 we again expect well over 30 graduates. This surge in popularity of our programs may be indicative of a renewed interest in chemistry among students concerned about sustainability, environmental protection, and health. It probably also reflects our attempt to more effectively advertise for our program, and certainly also shows that students are inspired by our first-year chemistry course. Having just taught a group of about 50

extremely sharp 3rd-year students in the fine art of electronic spectroscopy and computational chemistry, I can assure you that the future for Canadian chemistry is very bright.

For many years, undergraduate students left Queen's after graduation to join other universities as graduate students. We love to see our alumni excel elsewhere, but we were also sad to see them go, especially because our graduate program is next to none in Canada. In an effort to retain some of our brightest undergrads we therefore launched an "accelerated Master's" program. The most ambitious students can decide as early as in third year to pursue an MSc in our department and start working on their research projects in the summer after third year. They continue on the same project throughout the 4th year project course, and through the summer after graduation. When they then start taking graduate courses in the following fall term, they should be able to complete all course and project requirements in a single year. Graduation with an MSc degree can therefore happen only one year after completing the undergraduate degree. The first group of accelerated Master candidates is well on their way and is expected to graduate soon.

Our graduate students now receive more support than ever before thanks to you and your fellow alumni. With the support from the Robins family we established a new travel grant, which allows our graduate students to travel to international conferences more easily. Similarly, donations by John Langham, Jake Blair and fellow alumni from the 1960s chemistry cohort allowed us to endow a new fund in support of the accelerated Master's program and other initiatives. A heartfelt "thank you" to all our alumni and friends! You know who you are..!

Graduate students, faculty and staff have also been able to benefit from our departmental

seminar series. In the 2018-2019 academic year we hosted over 50 visitors to our department - and all gave presentations on their research to our department. The seminar program is expensive but necessary to keep us informed about research in other institutions, to build collaborations and – for graduate students – to check out future employers. It is therefore with great pride that I announce the launch of the Stan Brown Lectureship. The endowment in this lectureship fund will allow us to invite one or two high-profile researchers in the fields of physical, organic and physical-organic chemistry to our department each year. A special thanks to Stan and Donna for making this possible and to all their friends (very many friends!) for their support. More than anyone, Stan has been a mentor and role model to me. In my role as department head I frequently ask myself “What would Stan do?”, put my feet on my desk and try to think like an Albertan.

Natalie Cann, my predecessor as head, was similarly inspiring. Under the most difficult circumstances, Natalie was able to set the department up for success. She straightened out our finances, made very smart hiring decisions - we had zero turnover in our staff in 4 years, aside from well-deserved retirements – and completely revamped our undergraduate program delivery. It was then very easy for me to waltz into this job and reap the benefits of her accomplishments. Natalie retired this year and we wish her and Brian all the best. I will miss her insightful advice on the departmental administration, her expertise on molecular dynamics and quantum chemistry, and her generosity and empathy for all members of our department.

This issue of the QChem Chronicles also contains obituaries of two absolutely remarkable benefactors to our department. Erwin Buncel was a professor in our department from 1962 until his retirement in 1997. He continued to be research active as professor emeritus until only a few years ago, supervising students and publishing a large number of papers and book chapters. His many humanitarian and scientific contributions and his unwavering support of our department are evident to everyone who knew him well. He will be greatly missed by all of us.

Alfred Bader (B.Sc. 1945, B.A. 1946, M.Sc. 1947) was truly larger than life. Having

fled Austria under similar heartbreaking circumstances as Erwin Buncel left Czechoslovakia, he graduated from Queen's and quickly became one of North America's most recognized and accomplished chemists, most notably as one of the co-founders of Aldrich Chemical Company. In his many philanthropic contributions Queen's remained close to his heart. On page 7 you will find reminiscences by former Bader Chair Victor Snieckus and by our current Bader Chair Andrew Evans.

This note is already getting too long, so I am only pointing to the enormous success that our students and my colleagues had in obtaining scholarships and securing research funding for multidisciplinary and multi-institutional grants. Their work continues to be recognized through national and international awards. Please be sure to congratulate Ph.D. candidate Alex Veinot for having received a Vanier Scholarship, and Soren Mellerup for having received the national doctoral award by the Canadian Council of University Chemistry Chairs (CCUCC). Similarly Diane Beauchemin, Stephen Brown, Cathy Crudden, Philip Jessop and Suning Wang all received national and international recognition for their work. You will find a complete list of all award winners in this issue. It is awesome and humbling to be part of such an accomplished group of researchers.

As always I hope that you remain in touch. Please remember to send me a note when you are back in Kingston so that we can reconnect – maybe over coffee or tea. It is always great to hear from you.





Message from the Manager

Hello Q-CHEM Chronicles Readers!

It is not often that an article is written in highlighting the day-to-day efforts of Chemistry's support team, so I thought this would be a great opportunity to do so in addition to noting some of the exciting projects we've undertaken over the past year. As Peter noted, we have seen considerable growth and changes in the department; from student enrollment to faculty complement, not to mention the continuing policy and administrative process changes happening university-wide...It can be hard to keep up at times! All of these have had an impact on the department's regular workflow processes. To support the faculty recruitments, it took a lot of planning, consultation and swift action to coordinate, including being able to pull off a round of 3 back-to-back faculty recruitments in less than 6 weeks. It was incredible to watch the teamwork that took place to ensure success in this endeavour. We were also tasked in setting up our new faculty for success of which our staff pulled through in assisting with lab set-ups and providing dedicated onboarding initiatives. We are eagerly awaiting the arrival of the 3 newest faculty members recently appointed.

Revitalizing various spaces throughout Chernoff Hall was another priority for our

department – With the refreshing of four lounge areas came about new cabinetry and furniture in our common areas. We have a few more space refresh projects to address in the coming year, which will provide our faculty and students with enhanced working and learning spaces. Furthermore, we are embarking upon revamping our QCHEM Research Facilities with our instrumentation managers to streamline and enhance instrumentation access for our users. Some plans include heightened professional development for staff in addition to further planning for instrumentation upgrades, enhanced instrument booking, tracking and billing, all with a focus to increase our teaching and research capabilities. This will take some work but I am confident we will be underway rolling out the QCHEM Research Facilities strategic plan initiatives quite soon.

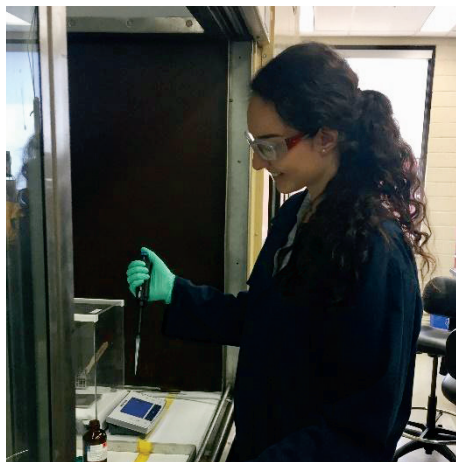
A huge thank you to the incredible Chemistry staff, who pull together each day to support the mission and vision of the department, in supporting the teaching and research excellence. It is an honour for me to be able to work with our staff, faculty, and students, who all enhance and strengthen our chemistry community.

Internship Experience

By Nicole Dozois

If you're like me, you find everything about chemistry interesting. There are so many labs and classes in undergrad that offer you a small window into the different fields, and it is so hard to choose what area you want to focus on! Working in industry for a year was an amazing opportunity for me to see how my academic skills fit into a real-world setting, and to help me decide on future research goals. I worked at DuPont in Kingston for a 16-month co-op term through the Queen's University Internship Program (QUIP). As a chemistry intern, I was responsible for working with a team to scale-up production of a key starting material for DuPont's Electronics and Imaging business. I got to be in the lab for most of my internship, designing, executing and reporting on meaningful experiments for our customers.

My experience working at DuPont helped me grow as a chemist and as a person, and I improved many of my professional skills in addition to my technical skills. I learned so much about project management and collaborative research by working as part of interdisciplinary teams that comprised



chemists, engineers and business leaders. I also got to study all the ins and outs of how a chemical company operates, including how they manage potentially hazardous processes with proper communication and safety regulations. In the end, my internship was a vital step in helping me to decide the area of chemistry that I wanted to pursue for my undergraduate thesis. For anyone thinking of doing an internship, I recommend going for it!

Endowed Lectureship in honour of Dr. Stan Brown

We are pleased to announce that we have established and endowed a lecture series in Dr. Stan Brown's honour. Stan Brown has been a colleague, mentor and friend to faculty, staff and students at Queen's University for many years. Stan is an outstanding researcher with over 180 peer-reviewed publications and ten patents. His ground-breaking work in physical-organic chemistry work was recognized with numerous scientific awards, the Killam Research Fellowship (2004), and the Fellowships of the Chemical Institute of Canada (1991), the International Union of Pure and Applied Chemistry (2008), and the Royal Society of Canada (2009). Please join us by giving back to future generations by honouring Stan Brown in the Department of Chemistry at Queen's. The first \$25,000

of support that is donated by alumni and friends will be matched dollar for dollar. Please consider visiting the Give to Queen's page to donate.





Saying Goodbye, Dr. Erwin Buncel

Dr. Erwin Buncel passed away on December 19, 2018.

For over 50 years Erwin was one of the pillars of our department. He joined the chemistry department in 1962, and was research-active well beyond his retirement in 1997.

He co-supervised students as recently as 2015. Erwin also published over 400 papers, over 20 book chapters and review articles, three books and over a dozen edited monographs. He was a fellow of the Royal Society of Canada and has received many awards for his work in physical-organic, bioorganic and bioinorganic chemistry. In 1998 a special issue of the *Canadian Journal of Chemistry* was published in his honour.

Erwin had a strong loyalty to our department and cared deeply about our students. In 2008, Erwin, his wife Penny and daughters Irene and Jacqui established the Dr. Erwin Buncel Scholarship to support students who enter the 3rd year of a chemistry program.

Erwin was born in Presov, eastern Czechoslovakia (now Slovakia), in 1931; he and his family suffered greatly during the atrocities of the Second World War. The Buncel scholarship was established in memory of his parents, Ignacz and Irena, and his sister Marta, who were persecuted and

died during the war.

Dr. Buncel only received a continuous and high-quality education after moving to England in 1946, where he attended William Ellis Grammar School in London, obtained a B.Sc. degree and eventually a Ph.D. at University College London on organosilicon chemistry in 1957. He then performed postdoctoral research at the University of North Carolina with Joe Bunnett, and at McMaster with Arthur Bourns. After a brief stint as an industrial chemist at the American Cyanamid Central Research Labs in Stamford, CT, he returned to Canada to join our department at Queen's in 1962. He quickly rose through the ranks and was a full professor by 1970.

Erwin's many humanitarian contributions must be mentioned; he was the director of a CIDA-funded project for the establishment of the Centre for Agrochemical Technology in Nigeria, and he served as the Canadian representative on the IUPAC initiative Chemical Research Applied to World Needs (CHEMRAWN). In his humble and gentle way Erwin was making our world a better place.

He will be missed by all of us.

The Legacy of Alfred Bader

By Victor Snieckus & Andrew Evans



Alfred Bader left Queen's an unmatched legacy. With devotion and love, he championed his lifelong pursuits of chemistry and art by donations, program initiations, and assistance in immeasurable ways. The regular dedicated visits of Alfred and

Isabel were much anticipated events and undoubtedly leave cherished memories for Queen's principals, deans, curators of the Agnes and numerous faculty and students. Perhaps the most vibrant reminiscences will forever stay with the students, some of whom were awarded Bader Fellowships (Art, Chemistry, Humanities, Jewish History) and others, together with faculty, who had magnificent study periods at another Bader donation, the Herstmonceux Castle in England. Alfred's recognition of high scholarship and economic disadvantage was also clearly displayed by Bader awards in Chemical Societies of Canada, Czech Republic, England, and USA.

Alfred was a true scholar of art. The Queen's community will miss visits, his joyful lectures to usually overflowing audiences, delivered by two projectors operated by his dear wife Isabel, whom Dr. Bader credits with giving vision to his work and projects, and his involvement with students by way of scholarships and simply by asking to mingle with them. Those who met Alfred casually during these visits will not forget the warm, friendly encounters. To reflect on Alfred is to recognize his compassion and humanity; his *Adventures of a Chemist Collector* (and a second volume) allows further appreciation. In addition to the two chairs in Baroque Art (Northern and Southern), the chemistry department is the fortunate recipient of the Bader Chair in Organic Chemistry for which I was honored as the inaugural recipient (1998-2009) and which P. Andrew Evans holds with distinction since 2012. In my

years, many memories vividly appear: in introducing Alfred at my former U. Waterloo, a student and I prepared 35mm slides of his *Aldrichimica Acta* art covers, with one insertion: an individual's face was replaced by that of Alfred (no photoshop). Alfred gave a boisterous laugh and asked for a copy of the slide; in chats with fellow chemists, I learned that Alfred would appear in a laboratory of famous organic chemists, unannounced and unknown to that chemist, and ask students what chemicals they could use to make their research projects advance; in very late hour calls, not uncommon and not necessarily from Milwaukee, Alfred would ask if chemist X "is a good scientist and worthy of support"; during one of my group's yearly luncheon meetings with Alfred and Isabel, answering questions of students relating his entrepreneurship abilities, he would exclaim: "That was a very good sandwich."

Twenty years ago, Alfred Bader gave me a second life in research activities which continues undiminished in the Bader Chair Emeritus position. With Alfred's insight and agreement, P. Andrew Evans will carry Alfred's dictum of legacy for excellence in continuum.

On the day of his passing, I wrote "Chemists worldwide, even those who met Alfred briefly, are bowing their heads and giving thought to the tremendous effect he has made in their work, their lives, and chemistry overall." (*Chem Eng. News*, Jan. 2019 <https://cen.acs.org/people/obituaries/Alfred-Bader-dies-age-94/96/web/2018/12>).

The above article originally appeared in the January 2019 edition of "Canada Chemical News"

Most chemists today could scarcely imagine a world where they could not simply turn to a catalogue to find the specialized chemicals they need for their work. Alfred Bader envisioned just such a world while working as a research chemist with a paint company in the early 1950s. Working with a partner in a garage, he began purchasing novel chemicals from academic laboratories and packaging them for mail order customers. Their firm, Aldrich Chemical Company,

continued

was instrumental in setting new standards for the speed and versatility of research, a reputation that the company has maintained to this day. For Alfred Bader, who arrived in Canada as a German-speaking teenage refugee in 1940, his dramatic entrepreneurial success became a further opportunity to repay those who had helped him along the way with an outstanding array of cultural, educational, and financial gifts. Nowhere was his gratitude felt more profoundly than Queen's University in Kingston, Ontario, the institution that offered him the opportunity to obtain an undergraduate education. Although his business took him all over the world, he regularly returned to Queen's, a campus and community he loved.

Alfred Bader died on December 23, 2018, at the age of 94. The loss was especially significant for the Queen's community, where he and his wife, Isabel, made numerous contributions in the form of a centre for performing arts, a priceless collection of historical European art, which includes three Rembrandts (note by the editor: a fourth Rembrandt was unveiled by Queen's in May 2019). The donations even include a castle in England, which now serves as an international study center for students, endowed research chairs in art history and chemistry in addition to countless bursaries, scholarships, and fellowships.

P. Andrew Evans, the current holder of the Alfred R. Bader Chair in Organic Chemistry at Queen's, a post that enabled him to interact with its founder, notes, "Alfred saw that providing these gifts was a way to provide students a world-class education in a similar manner to the way he had benefitted at Queen's."

Evans first met Alfred and Isabel Bader on one of their many trips to research laboratories around the globe. Evans was a first-year graduate student at the University of Cambridge and remembers being totally shocked to find the owner of Aldrich walking through the laboratories asking graduate students for input into potential new products and improving what was already being offered. Evans also reflects on the impact that Alfred's vision had on research output around the world. He notes that "a Nobel prize in chemistry is awarded for important discoveries or improvements that have a profound impact on the way that the science is then conducted. One could

make a direct analogy with what Alfred Bader achieved with Aldrich, since prior to its establishment there was limited access to chemical intermediates and reagents, which was at that time the rate-determining step in research. He was able to take new discoveries and offer them to laboratories at different institutions and companies and thereby accelerate new discoveries."

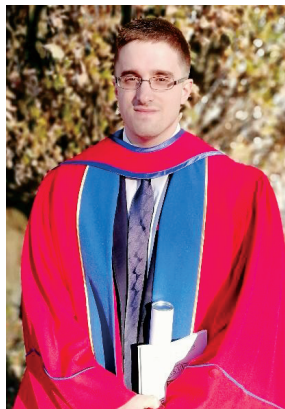
Evans goes on to say, "Like all great discoveries it is easy to see the impact after the fact, but we have to remember it was Alfred's vision that changed the face of research around the world ... pretty amazing stuff."

Evans also thinks that it is fitting that Alfred's life is being celebrated in so many ways around campus. "There are certain people who come our way that make a huge difference," he says. "He was such a person and a Queen's graduate, which makes us all very proud to be associated with the institution and the Bader family. I think the life-lesson here is that there is no easy path in life but drive and determination are critical elements to achieving success. Alfred had a pretty tough start in life, but he took his opportunity and made a difference. After all, this is why we are here — to inspire students to future success."

Chemistry Graduate Students Win National and International Awards and Recognition

By Dr. Suning Wang

Many graduate students in our department were successful in winning national and international recognition and awards in the past year. Here are three inspiring stories of our graduate students.



Soren K. Mellerup (PhD, 2018), winner of Banting and Alexander von Humboldt Postdoctoral Fellowships, and the 2019 Doctoral Award of Canadian Council of University Chemistry Chairs (CCUCC).

The past year has been very exciting for Soren K. Mellerup, a recent PhD graduate from the Department of Chemistry. In May 2018, he received the highly prestigious Banting and Alexander von Humboldt Postdoctoral Fellowships in recognition of his talents in chemical research. In addition, Soren was recently selected for the 2019 CCUCC Doctoral Award. This award, which is given to one recent PhD graduate by the Canadian Society for Chemistry (CSC) per year, in recognition of the winner's outstanding achievement and demonstrated potential in research. Soren's PhD thesis, entitled "Chiral N,C-Chelate Organoboron Compounds: Photoreactivity and Optoelectronic Applications" focuses on the interactions of light with organoboron molecules and the utilization of photochemistry for achieving new smart molecules/materials or rare chemical species. From his PhD work, Soren published 10 first-authored or equal-contribution first-authored original research articles and two dozens of other research papers. As part of the CCUCC award, Soren presented his PhD

research at the 102nd Canadian Chemistry Conference and Exhibition (CCCE 2019) in Québec City.

Originally from Thunder Bay, Ontario, Soren obtained his HBSc from Lakehead University, where he conducted undergraduate research as an NSERC USRA on aqueous, hypercoordinated silicon-saccharide speciation with Dr. Stephen Kinrade and Dr. Robert Mawhinney. He then pursued graduate studies in the group of Dr. Suning Wang at Queen's University as a Vanier Canada Graduate Scholar. During this time, he received many awards, including several "top talks" at both provincial and national conferences. Soren also held international fellowships in Japan (NSERC Michael Smith Foreign Study Supplement), China (Queen's Graduate Dean's Travel Grant for Doctoral Field Research), and Germany (DAAD Travel Grant), collaborating with Professor Shigehiro Yamaguchi at Nagoya University, Professor Tai Peng at the Beijing Institute of Technology, and Professor Matthias Wagner at Goethe-Universität Frankfurt on various aspects of boron chemistry. He is currently conducting postdoctoral research in the working group of Dr. Holger Braunschweig at the Julius-Maximilians-Universität Würzburg and Institute for Sustainable Chemistry & Catalysis with Boron (ICB), where he is exploring the possibility of using low-valent main-group compounds as precursors to bulk functional materials.



Alex Veinot (PhD candidate), winner of 2019 Vanier Canada Graduate Scholarship. Alex was pleasantly surprised with disbelief when he got the news on April 1st,

continued

2019 that he was a recipient of one of the 2018-2019 Vanier Canada Graduate Scholarship (CGS) awards. He immediately phoned his mother to tell her the amazing news and wished her a happy birthday (coincidentally!). Alex is conducting PhD research under the supervision of Dr. Cathleen Crudden. His research involves using N-heterocyclic carbenes (NHCs) to assist in the production of superior copper surfaces for microelectronic applications and collaborative research efforts with Dr. J. Hugh Horton (Queen's University), Dr. Chris Baddeley (University of St. Andrews) and Dr. Seán Barry (Carleton University). He will present his PhD work at the 102nd CCCE 2019 in Québec City.

Alex is originally from Nova Scotia. He completed his BSc with Honours at Acadia University as an NSERC USRA student under the supervision of Dr. Bobby Ellis. His undergraduate research involved developing new low-coordinate phosphorus molecules that can react with small molecules such as H₂. His interest in phosphorus led him to pursue an MSc at Saint Mary's University under the supervision of Dr. Jason Masuda, where he studied phosphorus chemistry and developed new interests in ligand design (specifically cyclopentadienyl ligands) as well as N-heterocyclic carbenes (NHCs). Under Dr. Masuda's supervision, he published 10 co-authored research papers. In 2017, Alex joined Dr. Crudden's group as PhD student.

Alex is an Indigenous student. He has taken many initiatives towards supporting Indigenous academics. In 2018, his academic success as an Indigenous student was featured in the Queen's Gazette article "Supporting Indigenous academics and Indigenous research". He also promoted Indigenous academics by presenting a talk entitled "Promoting Indigenous Academics: Challenges and Opportunities" at the 102nd Canadian Chemistry Conference and Exhibition (CCCE 2019) in Québec City.



Above: Morgan Lehtinen with Luc Robitaille VP Responsible Care at CIAC and QCIC member

Morgan Lehtinen (PhD candidate), winner of Best Presentation Prize at 2018 ACS National Meeting.

Morgan's PhD research focuses on the development of practical methodologies for the use of Janus filters in the separation of surfactant-stabilized oil-in-water emulsions for applications in oil recovery and wastewater treatment under the supervision of Dr. Guojun Liu. She gave an oral presentation of her PhD work on the use of Janus "smart" filters in oil-water separation in the symposium of Colloidal & Interfacial Science in Separation Processes at the 256th American Chemical Society National Meeting, held August 19-23, 2018 in Boston, MA. She was awarded the "Best Presentation/ Paper" in the division of Colloid and Surface Chemistry, presented by Industrial & Engineering Chemistry Research (ACS Publications). She was thrilled by the recognition of her PhD work by an international conference.

Science Rendezvous!

The Kingston's Leon's centre was home to Science Rendezvous. This year was another resounding success, from the opening ceremonies with Mayor Bryan Paterson and Town Crier Chris Whyman, to closing; especially one of the biggest attractions, the Chemistry Magic Show! This year's promotion by Rick Mercer and a guest appearance on the CKWS morning show with Bill Welychka, helped bring in more than 4000 children, parents and spectators to the event.

Science Rendezvous is primarily a celebration of STEM (science, technology, engineering and math) subjects. A special thanks must go out to the hundreds of volunteers, many of which are graduate students in the chemistry department, for their time and enthusiasm that made this day a success. The entire day

is geared towards children and promoting interest in science. This year had robotics demos, Baja off-road vehicle demos, lasers, hands-on tables with demos for kids a guest appearance by the YouTube famous duo Asap Science, police demonstrations, the Art of Science exhibit, the ever-popular Chemistry Magic Show, and much, much more. Of course, the "magic" show is not magic at all, it is much more exciting than that, it is all Science!



*Left & Above:
Photos from previous Science Rendezvous! event*



Retirement of Natalie Cann

By Peter Lookk

It may be surprising that Natalie Cann, former department head and molecular dynamics wiz, is entering early retirement at age 50. Then, again, when is there a better time to retire? Brian and Natalie have recently acquired a large property 45 minutes north of Kingston, on which they planted a small orchard, plan to grow vegetables and berries and generally enjoy life.

Growing up on the East Coast Natalie obtained her B.Sc. in 1989 from the University of New Brunswick in Fredericton and a PhD. in 1993 from Dalhousie University, where she was also an NSERC and Killam Fellow. After a postdoc at the other coast at University of British Columbia, she finally settled in the middle when she was hired as an assistant professor and Queen's National Scholar in 1997. Natalie quickly rose through the ranks and became an associate professor in 2004 and a full professor in 2014. Her research on molecular dynamics simulations of large ensembles of molecules focused on chiral recognition, chirality transfer and, more generally, on connecting microscopic molecular properties with macroscopic bulk properties. Natalie was equally concerned with the development

of better algorithms as well as with the optimal use of computing hardware, such as graphical processing units.

She was elected department head in 2012 and immediately brought the finances and administrative structure into order. Given that she was the 4th head in the same number of years, it was important to provide consistency and accountability to the departmental governance. Much of her work was nearly invisible to the outsider and I only appreciated the truly enormous impact of her restructuring when I became head myself and realized that Natalie had quietly and firmly set our department on a course for success. Her systematic, balanced and well-informed leadership style, didn't please all of us all the time but was incredibly effective.

After resigning the headship, Natalie remained my advisor for the months to follow – in fact I still consult with her, as much as I can. Given that Natalie and Brian remain in Kingston and therefore close to Queen's, I hope I can count on her wisdom and experience during the remaining years of my term as head.

Undergraduate Life

By Jansen Lau (Chemistry DSC president)

Greetings from the chemistry Departmental Student Council (DSC)! As the DSC president this year, I've had the pleasure of working with my team of 18 people in planning academic and social events for chemistry undergraduate students! The chemistry DSC is a council of undergraduate students ranging from first to fourth year and our goal this year was to have more outreach with regards to research opportunities within and outside the department. These opportunities included the undergraduate research positions under the federal NSERC grant which were promoted through more outreach by the DSC's year representative and a larger social media presence. The DSC would like to thank the department for all their assistance with planning our events this year!

In January and February, our fundraising events took place with our clothing sales and sticker sales. They were very popular and helped us raise a lot of money towards Formal which took place in early March at The Harbour Restaurant. Our 'Pool with Profs' event at The Grizzly Grill was also a great success and it was fantastic seeing students and professors all taking a break from their stressful semester.

The academic highlights of this year included our new event, 'Thesis Talk', which was a

thorough discussion of the honours thesis project involving current 3rd and 4th year chemistry students, and the course coordinator. There was also 'Major's Night' in late February where the DSC was able to speak to first year students about pursuing a degree in chemistry. Moreover, this year, the DSC 2nd year representatives started a new initiative where they interview various professors in the department about their field of research and asked them about tips for current undergraduate chemistry students. All these interviews were compiled in monthly 'Prof of the Month' newsletters which were emailed to students and posted on the DSC's social media pages. Finally, the fall and winter open house in November and March, respectively, gave DSC members and professors a chance to speak to high school students about a future in chemistry.

Like 'Queen's Chemistry DSC' on Facebook at <https://www.facebook.com/QueensChemistryDSC/> to stay updated on the DSC's initiatives and events in the upcoming academic year!





Graduate Society

By Jaddie Ho

Warm wishes from the Queen's Graduate Chemistry Society! As another academic year comes to a close, I have the opportunity to reflect on graduate student life in the chemistry department. The QGCS is an elected body of ten outgoing graduate students who have dedicated their time to advocate for their peers at the departmental and university level, striving to improve graduate student quality of life and have a bit of fun along the way! As the president of the QGCS, I have had the pleasure of working with a talented and outgoing executive that has worked together in order to make the department a warm and welcoming place for new and existing graduate students. Their efforts do not go unnoticed within the department, so allow me to introduce this year's QGCS executive: Suhaylah Sequeira, VP Internal Affairs; Morgan Lehtinen, VP External Affairs; Bailey Smith, VP Finance; Ridge Michael Ylagan, 5th Floor Representative; Lorena Ucciferri, 4th Floor Representative; Kasia Donovan, 3rd Floor Representative; Hannah Ramsay, Outreach Coordinator; Ola Pasternak, Union

representative; and Dragos Chiriac, Secretary.

This September we celebrated the 11th annual QGCS Graduate Research Symposium. Occurring during orientation week, the Symposium has evolved to highlight graduate research in chemistry at Queen's, as well as neighbouring institutions such as the Royal Military College of Canada and Trent University. The Symposium also serves as an informal setting to integrate new graduate students into the department and spark new discussions, innovations and collaborations within the graduate student community. This is an excellent venue for graduate students to present their research to peers, practice public speaking and share our passion for research.

Every year, graduate students choose a distinguished Canadian researcher to give the plenary lecture at the Symposium. This year, we had the pleasure of hosting Dr. Molly Shoichet from the University of Toronto. Dr. Shoichet is a charismatic, renowned and prolific researcher in her field and gave a

very well received talk. During her visit to our department, Dr. Shoichet was able to interact with students and faculty, attend and judge oral presentations, and participate in the poster session. We would like to sincerely thank Dr. Shoichet for taking the time to attend and present at our symposium!

As the QGCS Graduate Research Symposium has grown, there has been increased involvement and participation from the Queen's Chemistry Innovation Council. The QCIC is an outstanding group of Queen's chemistry and engineering alumni who continue to take an active role in the betterment of our department. Over the past few years, QCIC members have been invited to attend the symposium to interact with graduate students and remain involved and up to date on the research occurring in the local community. The involvement of QCIC members has proven to be invaluable for graduate students; being successful in their respective fields and careers, QCIC members have shed light on the diverse opportunities a chemistry degree grants, providing insight and advice on career paths.

The QGCS has continued to ensure graduate students are involved in the diplomacies within the chemistry department. As outlined in the departmental strategic plan, interviews to hire three new tenure track professors were conducted in the fall. In addition to having a graduate student representative on the hiring committee, graduate students were given the opportunity to attend candidate seminars and mock undergraduate lectures, as well as to provide written feedback to be taken into consideration throughout hiring. Having a strong student voice was very important and we thank the department for allowing the students to be involved. To those graduate students that attended all the interview sessions for each candidate, thank you for your time and commitment to the cause.

The graduate student experience in the Department of Chemistry is not just about serious event such as the Symposium or hiring! In continuing to foster a close and friendly community within the department, the QGCS still provides free coffee on Wednesday mornings. This weekly tradition has provided a venue for students to relax and socialize with their peers, as well as encourage discussion and collaboration amongst researchers. Summer BBQs have

continued enthusiastically, as our executive braved the scorching heat and sun to provide freshly cooked BBQ foods, frozen desserts and cool drinks to all students and staff over the summer. Additionally, the QGCS has organized other social events such as an adventure by ferry to Wolfe Island to challenge the corn maze! All survivors were rewarded with warm apple crisp, hot cocoa and roasted marshmallows by a campfire. We have also continued the tradition of hosting a winter formal at the Grizzly Grill for a night of delicious food, drinks and pool. Events such as these have fostered a community within the department, creating new memories for friends and colleagues to remember their time in chemistry at Queen's.

It has been a wonderful year serving as QGCS president. The opportunity to help organize and participate in the many events hosted by this executive has made the hard work truly worth it! As I approach graduating, I will look back on this year as being an exceptionally memorable one. Once again, I would like to thank this year's executive for their time, dedication and enthusiasm. It does not go unnoticed and the year's success is owed largely to you. To the incoming QGCS executive, I wish you the best of luck in all your endeavours and lots of success with new initiatives and events!



The 2019/2020 elected executives of Queen's Graduate Chemistry Society are: Morgan Lehtinen, President; Igor Cunha, VP Internal Affairs; Jevon March, VP President External; Tina Tabrizizadeh, VP Finance; Calvin Palmer, 3rd Floor Rep; Hailey Tomm, 4th Floor Rep; Bailey Smith, 5th Floor Rep; Matthew Sanger, Union Rep; Hannah Ramsay, Outreach Coordinator.

2018-2019 Departmental Highlights

June 2018

- Diane Beauchemin receives the 2018 Gerhard Herzberg award- she is the first woman to receive this award and, as stated in 2018 QChem Chronicles, she was also the first woman to receive the 2017 Maxxam Award by the CSC.

July 2018

- Dr. Snieckus and three Baltic expatriates organize an International Conference



Photo Above: Participants at the BOS 2018 conference in Tallinn, Estonia, organized by Victor Snieckus and three other Baltic expatriates. 22 countries were represented at BOS 2018 of over 250 attendees and included an address at the Opening Ceremonies by the President of Estonia, Kirsti Karjulaid.

September 2018

- Congratulations to Dr. Cathleen Crudden on winning the 2019 Arthur C. Cope

Scholar Award! This national ACS award is given “to recognize and encourage excellence in organic chemistry.” The recognition of Cathy’s contributions is especially remarkable because non-Americans typically don’t receive this award. Another recent exception was Andrew Evans winning this award in 2017 as one of the first Canadians in the 32-year history of the award. Also, in 2001 Victor Snieckus was the second Canadian Arthur C. Cope Scholar (after Keith Ingold, 1992).

- Many members of our Queen’s Chemistry Innovation Chemistry came to Queen’s on Sept 5th-6th to participate in career coaching for senior students, and hold a day-long meeting with departmental representatives on the state and future of the chemistry department. The QCIC was founded in 2001 as an advisory board to our chemistry department. Consisting mostly of alumni who have, since their graduation, progressed into positions of influence, the QCIC has been supporting our department in countless ways – some deliver courses, others coach graduate students, or make substantial donations. In the most recent meeting, the QCIC decided that they would provide an information session on intellectual property and patenting to graduate students and faculty. Also the possibility of industrial internships for graduate students was discussed. The social program such as the

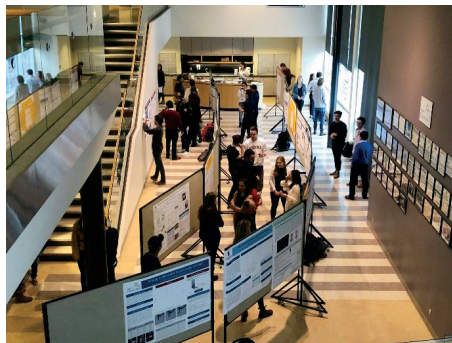
Teaching Assistant awards presentation, the reception and dinner gives students, faculty and QCIC members an informal way to build relationships. This year, the dinner was held in the phenomenal Isabel Bader Centre for Performing Arts. The after-dinner speech by Josephine Tsang (Ph.D. 2016) was introduced by a fanfare of 4 trombones and was the highlight of a classy and fun evening.



Photo Above:
Josephine Tsang (QCIC member), Barbara Crow (Dean of Arts & Science), Gordon Smith (Vice-Dean Arts & Science)

November 2018

- This year's Chemistry's 4th year thesis poster presentations, held on November 29th were a huge success!



- Dr. Suning Wang wins the first Canadian Association for Graduate Studies Award for outstanding graduate mentorship. The award is sponsored by the the Canadian Association of Graduate Studies.

October 2018

- On Saturday October 20th, 2018, the doors of Chernoff Hall were open to welcome back alumni. We were honoured to have students, staff, families, and alumni all in attendance to celebrate this year's Queen's Homecoming. The day was filled with food, fun conversations, and tours of Chernoff Hall!



February 2019

- The Mulligan and Petitjean groups secure one of the four 2019 provincial Cancer Therapeutics Innovation Pipeline grants from the Ontario Institute for Cancer Research to collaboratively work on the regulation of the RET protein.



March 2019

- Congratulations to Dr. Crudden who is awarded the 2019 Montréal Medal. This award is presented to an individual for their leadership and outstanding contribution to the profession of

continued



Photo Above: Dr. Philip Jessop

chemistry or chemical engineering in Canada.

- Congratulations to Dr. Diane Beauchemin, the recipient of the Clara Benson Award. This award is presented to a woman for her contribution to chemistry and the 2019 CIC Montreal Medal, awarded to a Canadian resident who has shown significant leadership.
- Dr. Ian Harrison presented the Harrison MacRae Lecture on March 29th



Photo Above: Dr. Diane Beauchemin, the recipient of the Clara Benson Award

April 2019

- Dr. Philip Jessop was on *The Morning Show* on CKWS discussing his inventive work on carbonated water as it applies to solving environmental problems.

Dr. Jessop also spoke at the University Relations and The Arthur B. McDonald Canadian Astroparticle Physics Research Institute's *IGNite: Research Stories to Inspire Generations* series on March 28; this quarterly event focuses on showcasing the breadth of research happening across Queen's University in a series of short talks. The talk gave Dr. Jessop an opportunity to elaborate to the public on his innovative research. Quoted from the talk and featured in the *Gazette*: "Society allows me to do research and it is only fair that in return I let society know what I'm doing," he says. "I find that many people like to hear about new ways to reduce environmental harm." One of his graduate students, Sarah Ellis, also had the opportunity to present her research. Afterwards, guests were able to see live demonstrations at the reception.

- Congratulations to Kevin Stamplecoskie on the renewal of tenure track assistant professor faculty position.
- Congratulations to Nick Mosey on his promotion to full professor



Two photos above: The Harrison-MacRae Family Lecture Series was established through the generosity of Queen's alumni, the late John H. Harrison and Elizabeth Harrison. This year we were excited to invite their son, Dr. Ian Harrison, to speak about *Alkane Reaction Dynamics at Metal Surfaces*. We were especially honoured to have his mother in the audience!

May 2019

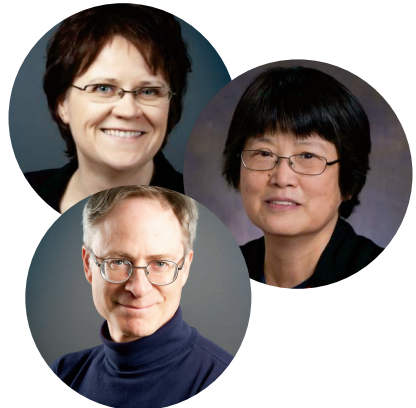
- Congratulations to Dr. Philip Jessop, on being one of the four leading researchers from Queen's University who have been awarded the NSERC Brockhouse Canada Prize for their work in building a sustainable future.



- Congratulations to Dr. Richard Oleschuk, on being awarded an NSERC Strategic Grant of \$734,600 for a project entitled "Advanced Sample Introduction for Mass Spectrometry".



- Congratulations to Suning Wang (*below, right*) and Cathy Crudden (*below, left*) for being awarded the highest research-related honour at Queen's, by being named a Distinguished University Professor for 2018-19.



Above:

Kevin Stamplecoskie (top), Nick Mosey (bottom)

- The 4th year project presentations, the Walter McFarlane Smith Prize awarded to Daniel Barter and Lucas Kapeniak, M. Sullivan & Son Ltd. Scholarship awarded to Emily Mundy are held on April 4. The judges for the competition were Kevin Stamplecoskie and Ralph Whitney.
- The following students win national NSERC awards for 2019-2020: Sarah Ellis (PGSD Jessop group), Hannah Ramsay (CGSM Stamplecoskie group), Jevon Marsh (CGSM Petitjean group).
- Ontario Graduate Scholarship recipients for 2019-2020 are: Seyedehgoonay Yousefalizadeh (Stamplecoskie), Angus Sullivan (Crudden), Polina Novoseltseva (Suning Wang), Nayeon Kim (Ross), Emily Groper (Loock/Oleschuk), and Tim Salomons (Oleschuk).
- Congratulations to Tucker Carrington (*pictured on right, very bottom*) for winning the 2019 Prize for Excellence in Research! He is one of five recipients of the award at Queen's University this year and the latest in a long list of outstanding researchers from our department. The prize was presented at the Spring Convocation this year and a public lecture will follow within the next six months.
- Congratulations to Dr. Gregory and Lisa Jerkiewicz on the birth of their son, Samuel, born on April 14th.

TA Teaching Awards



Promoting Excellence in Teaching Assistants in Chemistry

TA Award recipients (above, left to right): Betty Lin, William Patrick Doolan Prize in Chemistry; Derek Esau, Friends of Chemistry TA Award; Morgan Lehtinen, Friends of Chemistry TA Award; Eduardo De Barros Ferreira, Friends of Chemistry TA Award; Julie Deichert, Fisher Scientific Award



Congratulations to the Class of 2019!

We are pleased to announce that the following speakers have been confirmed for our 2019-2020 Seminar Series. For more information and dates, please visit our website at:

<http://www.chem.queensu.ca/departamental-seminar-series>

Prof. Abigail Doyle, Princeton University

Prof. Melanie Sanford, University of Michigan

Prof. Paul Ayers, McMaster University

Prof. Shigehiro Yamaguchi, Nagoya University

Luc Robitaille, Chemistry Industry Association of Canada

Prof. Marian Chatenet, L'Universite Grenoble Alpes

Prof. Laura Kiessling, Massachusetts Institute of Technology

Prof. Jillian Buriak, University of Alberta

Prof. Audrey Moores, McGill University

Prof. Ulrich Schollwöck, Ludwig-Maximilians-Universität München

Prof. Peter Schreiner, Universität Giessen

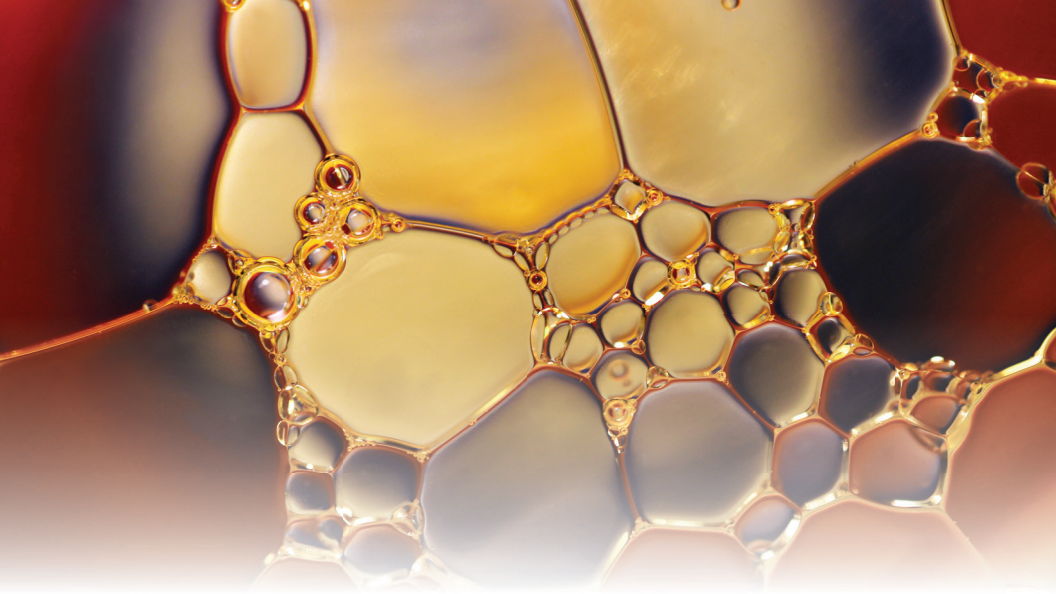
Prof. Shigehiro Yamaguchi, Nagoya University

**Come join us during
Homecoming
on Saturday, October 19th, 2019**



**from 10:30 am to 12 pm
for departmental tours hosted
by the Chemistry
graduate students and faculty**





Photograph above by Derek Esau

