Q-CHeM CHRONICLES

Queen's UNIVERSITY

ANNUAL
AUGUST 2017

Professor Stan Brown Receives Queen's Award for Excellence in Graduate Student Supervision

By Mark Raycroft

Congratulations to Prof. Stan Brown for winning Queen's 2016 Award for Excellence in Graduate Student Supervision!

Prof. Brown completed his PhD in 1972 under the supervision of Prof. T. G. Traylor at the University of California, San Diego, focusing on the stabilization of carbonium ions by strained σ-bonds. After completing an NSERC postdoctoral fellowship with Prof. Ronald Breslow at Columbia University in the field of model enzyme systems, Prof. Brown joined the faculty at the University of Alberta in 1974. He was recruited to Queen's University in 1995 where he acted as Head of the Department of Chemistry until 2001. The department was transformed under his leadership, including the construction of Chernoff Hall and recruitment of many of the top-notch faculty and staff that make up the Department of Chemistry today. Prof. Brown transitioned to the status of Emeritus Professor in 2014 and continues to maintain a research program in the department.

The Award for Excellence in Graduate Student Supervision is a distinction granted by the School of Graduate Studies that recognizes outstanding supervisors who are dedicated to and demonstrate excellence in advising, monitoring, and mentoring of graduate students. Prof. Brown's nomination was enthusiastically supported by the Department of Chemistry and nine previous graduate students whose training with Prof. Brown spans as far back as 1988. The letters of support unanimously spoke to Prof. Brown's attentiveness to his students' needs and his provision of opportunities for growth in research, teaching, and scientific communication. Prof. Brown's philosophies as a supervisor have fostered the development of strong and independent graduate students who have gone on to lead impressive careers in academia, industry, government, and other vocations. Prof. Brown received the award during a convocation ceremony at Grant Hall on November 16th, 2016 with several of his past and present graduate students in attendance. Throughout the years, Prof. Brown would frequently reassure his students with the encouragement, "You will do famously!" This is an opportune moment for all of them to take pleasure in the recognition that Prof. Brown himself has done just that. Congratulations!

(Photo by Lars Hagberg)

Prof. Stan Brown receives Queen's Award for Excellence in Graduate Student Supervision

Message from the Head

Greetings, Alumni and Friends,
We try to keep things interesting for you and change Department Heads every other year – as the 2016-2017 Interim Head it is now my turn at the helm of the chemistry department. While most of my colleagues would agree that I haven't really distinguished myself as a university administrator in the past, I actually have had a few years of experience on the board of the Canadian Society for Chemistry, as a Queen's Senator (not a hockey team, but Queen's University's main governing body), and as an organizer of conferences and similar events. Also, I did my German National Service as a nurse in a rehab clinic. One might argue that I then obtained some job skills which are surprisingly transferrable to my current job!

Frankly, being a Department Head is fun and not as hard as one might think. I am the coach (and cheerleader…) of a highly successful team, and who would not want to be on the winning side? Just how well we did this year, you can see for yourself by reading the highlights.

Alumni and Friends of our department, such as you, play a large role in our success! A major donation by our Queen's Chemistry Innovation Council members allowed us to purchase new computers and monitors for our undergraduate teaching labs. It pains me to admit it, but the old PCs were updated in 2005 from Windows 98 to Windows XP and could then no longer be updated, because their computing power was too low to run any of the newer operating systems – very sad… Clearly, replacing these computers was badly overdue and our students and instructors were very grateful for the donation by the Robins family.

Also, as you can see we secured several major grants that permitted us to renew our departmental research equipment, such as the NMR facility, X-Ray diffraction and surface characterization lab. Many research groups were also successful in securing funding for either individual research projects or national and international collaborations.

Aside from research grants several of our colleagues received recognition for their work through awards. Andy Evans received the ACS Cole Scholarship, Cathy Crudden was awarded the RU Lemieux Award of the CSC and became a Canada Research Chair, Diane Beauchemin won the Maxxam Award of the CSC, Stan Brown won the Queen's Award for Excellence in Graduate Student Supervision, Richard Oleschuk was named "Faculty of the Year" by the undergraduate student society, Tucker Carrington obtained a Humboldt fellowship, and Philip Jessop has been asked to join a panel by the Council of Canadian Academics to assess the current state of science and technology in Canada.

This year saw the 60th anniversary of Queen's Chemistry's first Ph.D. defense. The indestructible Dr. Harry McAdie (Ph.D. 1956) visited our department during Homecoming, and addressed our current graduate students when handing out the Teaching Award that bears his name. Students were impressed when hearing about his "life in chemistry" and about his research in our department at the time of Elvis Presley and Harry Belafonte. Dr. McAdie was one of many visitors during Homecoming – a successful event that also featured tours of the department, a BBQ by the students and the launch of the new "Baird Lectureship". This lectureship honours Mike Baird who has retired after being a professor for 50 years in our department. Many of the thousands of students who have been taught by Mike over the years remember him as a passionate lecturer and a compassionate mentor. The fund supporting this lectureship was initiated by two of Mike's first students, Will Rogers, B.Sc (1977), Ph.D. (1980) and Helen Ferkul, B.Sc.(1980), MSC. (1982). The inaugural Baird Lecturer will be Richard Schrock (Nobel Prize 2005) who will visit us in the Fall of 2017.

Very recently the inaugural speaker in the Walter Szarek Lectureship has also committed! Very fittingly Prof. Fraser Stoddart (Nobel Prize 2016) will be visiting us in the coming year to help us celebrate Walter's many contributions to carbohydrate chemistry and drug development. The relationship between Drs. Stoddart and Szarek goes back to the late 1960's when Dr. Stoddart was a NRC Postdoctoral Fellow in the Queen's chemistry department. During this time he was in the group of Prof. J.K. Jones, but was effectively supervised by Walter Szarek, who had been hired only a year earlier. It was Walter who directed Stoddart's research interests from carbohydrate chemistry (Jones' work) to the, then new, area of macrocycle synthesis and chemistry, for which he received the Nobel Prize.

We hope you enjoy this update and sincerely hope that we will see you soon – maybe at Homecoming or maybe when visiting Kingston. Please make sure that you drop me a line when you are in town and we can catch up.

Peter Loock

Message from the Manager

Greetings Q-CHeM Chronicles Readers! This year has been an extremely busy and exciting year for our department with several positive advances and activities. Some notable highlights over the past year include:

- **New Equipment Arrivals:** A new X-ray photoelectron spectrometer (XPS) arrived into our building late last year. This was just the start to many large instruments moving into our teaching and research instrumentation facilities. The X-Ray diffractometer (XRD) followed next; and Dr. Gabriele Schatte has worked tirelessly to get these two instruments up and running for the department. We are awaiting the arrival of our new NMR probe which is in the shipping queue, and the transmission electron microscope (TEM) shortly thereafter. The instrumentation renewal has been instrumental in creating and maintaining nationally recognized state-of-the art teaching and research facilities. While bringing some of this equipment physically into the building has been challenging (and requires extensive coordination!); it's incredible to see everyone pull together to ensure that our equipment is up and running smoothly with minimal disruption. See accompanying pictures, to the right, to see some of our adventures.

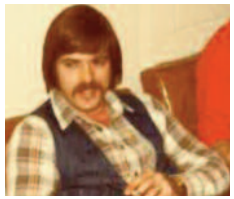
- **Heat Recovery Installation:** There is a massive update to our air handling system planned for Chernoff Hall in August 2017. As part of Queen's large energy conservation and sustainability project (Energy Matters; www.queensu.ca/gazette/stories/investment-sustainability). It has been reported that the new system installation is the largest project of Queen's Energy Matters initiatives with substantial energy savings and a focus on long-term sustainability.

- **Improvements to Science Stores:** Science Stores is working with Strategic Procurement Services to adopt a new e-Procurement system, called aQuire – named by Chemistry's Undergraduate Assistant, Meredith Richards (New procurement system aQuire name; www.queensu.ca/gazette/stories/new-procurement-system-acquires-name). Five other universities have successfully adopted this system, and I'm confident that aQuire will not only aid in infusing efficiencies to our store but will also offer faculty and staff an integrated marketplace for all procurement activities… Onerous paper-pushing will soon be out the door!

- **Staffing Changes**

  Robin Roberts retires in Summer 2017. Robin Roberts, our Lead Hand/NMR Specialist is moving onto retirement effective June 30th. Robin joined the department in 1980.

  Over the years, he continuously worked to keep our instrumentation running smoothly.



Before

After

His dedication to fixing all equipment (both large and small) and his support with the NMR and Surface Analysis instrumentation, among our other teaching and research facilities has been fundamental. His wealth of knowledge will be missed.

Cole Reed

- I am pleased to report that Cole Reed (right) joined our team as Chemical Technologist last year at the onset of the 2016/17 academic year. Cole makes sure that the undergraduate labs run smoothly and that students have a great lab experience.

- Additionally, we are currently underway with recruiting a Surface Analysis Instrumentation Manager who will help support the new TEM, our existing SEM, and the Surface Analysis facility, in addition to expanding research support capabilities within our instrumentation facilities. (There have been enough recruitment activities within our department that I will soon be able to add HR and Recruitment Specialist to my CV.)

These are just a few highlights on the operational side. I would also like to take this opportunity to acknowledge the incredible staff that I have the pleasure of working with each and every day. Everyone's hard work and continuous effort is a huge contribution to our ongoing success! I look forward to the continued opportunities and challenges ahead. Many thanks!

2016-2017 Departmental Highlights

JUNE 2016

- PhD student Jesse Vanderveen (Jessop group) receives the Kenneth G. Hancock Memorial Award from the American Chemical Society. The award provides recognition for outstanding student contributions to furthering the goals of green chemistry through research or studies. Two awards are given per year, typically one for an undergraduate student and one for a graduate student anywhere in the world. Jesse's work has been about the physical chemistry and applications of switchable-hydrophilicity solvents.
- Eduardo de Ferreira of the Jerkiewicz group is the winner of the Ontario Trillium Scholarship for 2016-2017. This prestigious award through the Ontario government is valued at $40,000 per year and is based on academic excellence.

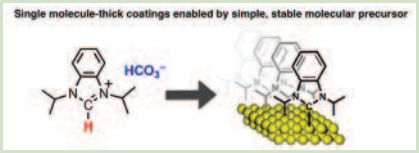
JULY 2016

- The first joint symposium on "*Elements Functions for Transformative Catalysis and Materials*" with chemists from Nagoya University, Kyoto University, Münster University, Technische Universität Berlin, and Queen's University takes place on June 29th, 2016 in Chernoff Hall.
  This Canada-Japan-Germany joint symposium was supported by a grant from the Queen's Research Opportunities Funds (QROF, international) and hosted by Professor Suning Wang and Professor Cathleen Crudden in the Department of Chemistry.
  19 oral presentations on the latest discoveries and advancement of catalysis and materials chemistry based on main group elements were delivered at the symposium by 7 research teams from Japan, 3 teams from Germany, and 4 teams from Queen's. This joint symposium is part of the activity of the research network established between participating universities that facilitates joint research activity and student exchanges to each other's laboratories to gain valuable international experience.

- The Department of Chemistry hosts the Boron in the Americas (BORAM XV) conference June 25th to June 28th at Chernoff Hall and the Chernoff Auditorium.

The 2016 BORAM is the first one held in Canada with Professor Suning Wang as the organizer, Professor Cathleen Crudden and Professor Victor Snieckus as co-organizers. The meeting was attended by more than 150 participants from different regions of the world including Canada, USA, Germany, UK, France, Japan, China, India, Korea and Mexico, and nearly two thirds of them were students and postdoctoral fellows, making it the biggest BORAM meeting ever! 57 oral and 55 poster presentations were given at the meeting, focusing on the relationship of structures/bonding and reactivity of boron compounds, new synthetic methodologies based on organoboron compounds, and the applications of boron-containing molecules or polymers in catalysis, new advanced materials such as boron-doped graphenes, organic light emitting diodes, organic solar cells, bio-imaging, sensors, medicines and other topics.

- The Crudden and Horton groups publish a paper in Nature Communications describing a new bench stable organic compound that can be used to prepare NHC films on gold.



AUGUST 2016

- Cole Reed joins our team as a Chemical Technologist.

SEPTEMBER 2016

- Dr. P. Andrew Evans, Bader Chair in Organic Chemistry and a Tier 1 CRC is selected for a 2017 Arthur C. Cope Mid Career Scholar Award for his seminal contributions to the development and mechanistic understanding of metal-catalyzed organic reactions and their implementation as key steps in the expeditious total synthesis of a complex bioactive natural products.

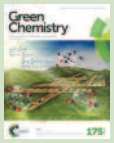
- Congratulations to Meredith Richards who is presented with an IPad Mini from Andy Green the Director of Strategic Procurement Services. The name for the new procurement system is acQuire submitted by Meredith.

OCTOBER 2016

Before

After

- One of the 2016 Nobel Laureates, Dr. Stoddart, was in our Department at Queen's University from 1967-1970 while he was an NRC Postdoctoral Fellow from 1967-1970. During this time he was in the group of Prof. J.K. Jones, but was effectively supervised by Walter Szarek. Walter Szarek who directed Stoddart's research interests from carbohydrate chemistry (Jones' work) to the, then new, area of macrocycle synthesis and chemistry. As Walter said: "… and the rest is history…" [The photo shows Szarek and Stoddart in 1979]. Both, Bernard Feringa and Sir Fraser Stoddart visited our department, recently. Feringa delivered the 2010 McRae lecture and Stoddart gave the 2012 Jones lecture.



- Innovation, Science and Economic Development Canada and the Council of Canadian Academies name a panel, including Dr. Philip Jessop, to assess the current state of science and technology and industrial R&D in Canada. The panel will prepare a report, over the next year, documenting Canada's science & tech and R&D strengths, weaknesses, and trends. The Royal Society of Chemistry announces that the new Chair of the Editorial Board for the journal Green Chemistry, starting in January, will be Philip Jessop.

2016-2017 Departmental Highlights

NOVEMBER 2016

- Peter Fahrenholtz, the Consul General of Germany, visits several labs in the Department of Chemistry on November 3rd. He learned about our research from students in the groups of Jessop, Jerkiewicz, Oleschuk and Loock.
- Congratulations to graduate students Zijie Wang and Shuaishuai Huang of the Liu group. Their recent paper in Angewandte Chemie International Edition has been highlighted by the ACS Chemical & Engineering News. This paper describes how to graft a single polymer in one reaction step onto fibres of cotton fabrics to yield a filter that not only breaks emulsions but also separates de-emulsified oil from water.

DECEMBER 2016

- The annual holiday lunch is held Wednesday Dec. 14th in the 4th Floor lounge.

FEBRUARY 2017

- In February's issue of Science Advances, Dr. Gregory Jerkiewicz and his French collaborators of the Université de Poitiers, Drs. Stève Baranton and Christophe Coutanceau, report on an exceptionally high H loading of octahedral Pd nanoparticles of 7.8 nm in size. Upon H absorption, the nanoparticles develop a core-shell-skin structure, the existence of which is observed for the first time. Read more in Science Advances.

MARCH 2017

- The Undergraduate DSC banquet is on March 20th. Richard Oleschuk receives the Faculty of the Year award and Travis Ferguson (Loock group) receives the TA of the Year award.
- Abouzar Toubaei receives the Christopher Knapper Teaching award for this academic year which was presented by the Alma Mater Society (AMS).

APRIL 2017

- The following students win national NSERC awards for 2017-2018: Amanda Corkum (CGSM Stamplecoskie group), Marco Gibaldi (CGSM Jerkiewicz group), Hannah Ramsay (CGSM Stamplecoskie group), Timothy Wright (PGSD Evans group).
- Ontario Graduate Scholarship recipients for 2017-2018 are: Lorena Ucciferri (Ross), Brandon Becher Nienhaus (Liu), Jasmine Buddingh (Liu), Joshua Clarke (Crudden), Mina Narouz (Crudden), and David Simon (Oleschuk/Zechel).

MAY 2017

- Professors Crudden, Loock, Wu, and Jessop's articles are included in a special issue of the best of Canadian chemistry, in honour of the Royal Society of Chemistry 100th Canadian Chemistry Conference and Exhibition.
- Philip Jessop receives the 2016 NSERC Strategic Partnership Grant of $552,740 for research using waster Co2 and waste heat to recover drinkable water from seawater and wastewater.

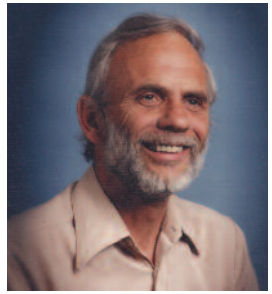
JUNE 2017

- Robin Roberts, Lead-Hand/NMR Specialist, announces his retirement as of June 30, 2017. Robin joined the Department of Chemistry in 1980 and has continuously worked to keep the department's instrumentation running smoothly. We thank Robin for his dedication to fixing all equipment (both large and small); supporting the NMR and Surface Analysis instrumentation, among our other teaching and research facilities have been instrumental to the ongoing success of our department.

Saying Goodbye

GORDON, Professor Robert (Bob) Dixon 1936 – 2017

By Dr. John Stone



Robert Dixon Gordon, Professor Emeritus of Chemistry, Queen's University

Professor Robert (Bob) Dixon Gordon passed away in his 81st year in St. Mary's Hospital, Kingston on February 20, 2017. Bob joined the chemistry department in 1966 and took early retirement in 1996 after 30 years of devoted service to the department and the university. He was born in Toronto in 1936 and attended McMaster University where he obtained a B.Sc. in Chemistry and Physics in 1959 and was awarded the Chancellor's Gold Medal at the completion of his undergraduate studies. An investigation using ultraviolet emission spectroscopy under the supervision of Professor G.W. King at McMaster determined the structure of the carbon monochloride molecule. This M.Sc. program heralded the commencement of a lifelong interest in the interpretation of electronic spectra for the structural and motional description of molecules. With a strong desire to sample life abroad in 1961 Bob travelled across the Atlantic with a National Research Council of Canada Special Scholarship for doctoral research with Professor D.P. Craig in the Chemistry Department of University College, London University. His Ph.D. thesis (1964) described the interpretation of the polarized, ultra-violet absorption spectrum of thin, oriented single crystals of phenanthrene at liquid helium temperatures.

As an adventure into something out of the ordinary before settling down, Bob obtained a position as a Lecturer at the University of Ibadan, Nigeria from 1964 to 1966. There he attempted, with little success he reported, to set up a crystallography laboratory. Frequent interruptions in power and water supplies were not conducive to such an endeavour. He was fortunate to leave Nigeria in 1966 for Canada just after the first and before the many subsequent military coups and also before the Biafra bloodbath.

Bob arrived at Queen's when the department was undergoing a rapid expansion in faculty under the guidance of the head, Dr. Bob McIntosh. He was one of five new recruits in 1966. Experiments were initiated on electronic transitions at low temperature in aromatic molecular crystals and in aromatics and carbonyls in the gas-phase. An early novel observation with CF_3NO that its torsional conformation changes from eclipsed in the ground state to staggered in the excited state was made with a simple 1.5 m spectrometer in the undergraduate laboratory. This was confirmed in other laboratories using supersonic-jet cooling and laser induced fluorescence. Bob's subsequent work involved investigations of hindered internal and other large amplitude molecular motions. Collaboration with researchers in the USA and UK having state of the art high-resolution spectrographs, lasers and jet-cooled molecules allowed a fruitful continuation of these studies throughout his career.

In the 12 years, between 1980 and 1996, he served as Chair of Undergraduate Studies in the department and for 8 of those years he was also Chair of the Arts and Science Board of Studies. Through teaching physical chemistry at both undergraduate and graduate levels and his counselling of students in his administrative roles Bob had a great influence on many students in the chemistry department.

After retiring in 1996, Bob was involved in a wide variety of volunteer activities in Kingston including Martha's Table, the Income Tax Clinic, the Marine

Museum and the Rideau Trail. In 2013 he received the City of Kingston Distinguished Citizen Award and in 2010 the Provincial Outstanding Volunteer Award. He was a keen choir singer, was a dedicated member of Chalmers United Church choir for over 40 years and sang in several other local choral groups.

MULLIGAN, Patrick Michael July 9, 1941 - March 28, 2017

By Len Rose

Most undergraduate students who have completed a lab course in our department will remember Pat Mulligan - the always-helpful, immensely knowledgeable and approachable Chemical Lab Technician who ensured that our undergraduate labs in Gordon Hall would always run so smoothly. Pat had a great sense of humour, love his job and students adored him in return. He was also very much interested in the welfare of fellow workers and, as an executive member in CUPE 254, worked on many committees over the 35 years that he was at Queen's.

While not helping students with their lab work Pat enjoyed the noon hour bridge games with lab techs and other chemistry staff. He seemed to know what contract would generate a little excitement for his pal Scotty. Pat was also a fierce opponent on the snooker tables in the John Deutsch Centre. If he didn't have a good shot available, he would certainly make sure his opponents had a real challenge for their next shot. In the summer Pat was game for a set of tennis doubles on the courts above the old Jock Harty arena. He also enjoyed playing badminton and continued playing long after retirement. Pat retired from the chemistry department in 2001 but is still remembered as a wonderful colleague. He passed peacefully on March 28th, 2017 leaving behind his wife Shirley and his children Kimberley and Ian.

Undergraduate Life

By: Kasia Donovan and Karim Gordon

With another successful year completed, the Chemistry Department Student Council (DSC) presidents, Kasia Donovan and Karim Gordon are excited to share what we have done and accomplished during the 2016/2017 academic year.

The Chemistry DSC is comprised of undergraduate students from all years of study. Our aim is to provide a social environment for all chemistry students, while acting as their student leaders and voice within the department. We meet weekly to discuss the on goings of the department, as well as to plan fun and exciting events for students, staff, and faculty. We strive to create a positive, comfortable and enjoyable learning environment between professors and students in the Department of Chemistry. Our primary aim is to build a safe community for students, where they are comfortable and engaged in the life of the department. We accomplish these goals by hosting educational and social events throughout the school year. Some of our events include: pool with profs, intramural sports team, pub crawls, night at Barcadia (Kingston's new arcade bar), department clothing sales, study and snack sessions and information sessions for 3rd and 4th year students regarding opportunities in the department. Our most famous event is the end of year departmental banquet. Our department banquet aims to provide a night at the end of the school year where students and professors can interact in a social, stress free and fun environment.

This year the end of year banquet was held at the Renaissance Event Venue and it was an incredible night of dining and dancing to celebrate the completion of another successful year. A game of "Table Trivia: How Well Do You Really Know Your Professors?" was a big hit among both the students and faculty members who attended. Departmental awards were given out to Professor and Teaching Assistant of the Year, which was voted on by Undergraduate students. This year, Dr. Richard Oleschuk won Professor of the Year and Travis Ferguson won TA of the Year.

As mentioned, the DSC held multiple academic events and information sessions to help the students with their current and future studies. The events offered included a first year information session for first year students considering chemistry as a major, a session for third year students regarding thesis projects in the department, and finally an introductory meeting regarding pursuing a Master's degree within the department of chemistry. The Chemistry DSC also volunteered with the annual "Majors Night" for first year students and the Open House events for high school students who are entering post- secondary education.

The Chemistry DSC completes other administrative duties in the department such as conducting USAT professor evaluations, reporting concerns to the Department Head and Undergraduate

Chair, meeting with the Arts and Science Undergraduate Society (ASUS) regarding the progress of our department, as well as participating in Faculty Board meetings, to vote on important decisions in the Faculty of Arts and Science. This year the department student council was also excited to meet with an external review board regarding the re accreditation of our program. We appreciated the opportunity to be given a voice in this process, as well as to inspire change in the department. This year we had the opportunity to work closely with the Queen's Chemistry Innovation Council (QCIC) and are working towards providing chemistry students with mentors who have graduated with a chemistry degree and are now working in industry.

Thank you so much for allowing us to be your Chemistry DSC presidents this year. This has truly been a rewarding experience for both of us, and a highlight of our time at Queen's. We would like to thank all members of the Chemistry DSC for their continuous help this year. Furthermore, it was an honour working along Department Head, Dr. Peter Loock as well as the Undergraduate Chair, Dr. Anne Petitjean to inspire positive change in the department. We hope the ideas we have presented continue to make a positive impact on the department for many years to come.

We are excited to become alumni of the Department of Chemistry, and to observe the positive growth and success that we are sure will take place for many years to come.

Graduate Student Life in the Department

by Zach Ariki

Greetings from the Queen's Graduate Chemistry Society! As Spring approaches, we look back on a busy and eventful year for the graduate students in the chemistry department. As the President of the society, I am honoured to share the memories of our social events, fundraising, and political endeavors but before that, I would like to introduce and graciously thank the rest of the QGCS Executive who were truly committed to making this past year memorable: Josh Clarke, Vice-President (Internal); Sarah Piotrkowski, Vice-President (External); Amy MacLean, Vice-President (Finance); Suhaylah Sequeira, Union Representative; Jaddie Ho, Sports & Recreation Representative; Lucas Choma, 3rd Floor Representative; Marshall Timmermans, 4th Floor Representative; Jenny McLeod, 5th Floor Representative; and Kelsey Viner, Secretary.

This year, the QGCS took on a more active political role in the department. Our first undertaking was geared towards the overall health and well-being of the graduate students. With the goal of having a third-party mediator intimately familiar with the inner-workings of the chemistry department, we elected two faculty ombudsmen. They are always available to talk, listen and act on behalf of the concerns of the graduate students who elected them. We would like to thank the faculty as a whole for their support and collaboration in implementing these newly-founded positions.

With an ear to the ground on student issues, we then sought to better familiarize ourselves with the administrative side of the department. We sent out a call to the student body for graduate student representation on nearly all departmental committees, and I'm pleased to say that we now have many members of the QGCS executive as well as several graduate students filling these roles. In this way, we hope to stay more connected to the department as well as better representing our graduate students' interests.

Our biggest undertaking this past year has been a new and exciting collaborative effort with the Queen's Chemistry Innovation Council (QCIC). Following the success of the 2016 Graduate Symposium and the QCIC meeting, we eagerly began discussing a joint event between the QCIC and the Graduate Symposium. Planned for September 2017, the symposium will feature a full day of research presentations and posters from undergraduate students, graduate students, and post-doctoral fellows, so that attendees can experience a true flavour of the research done right here at Queen's University. Also present will be many invited professional chemists from the Kingston, Ottawa, and Toronto areas. Our hope is to boost student networking and collaboration during and after their education. Additionally, many prominent members of the QCIC will be present and as always, there will be a joint event for QCIC members and students. The 10th annual symposium promises to be exciting and engaging. We can't wait to see how it unfolds!

Aside from the success of our political work this year, the QGCS's fundraising efforts were at an all-time high, with revenue generated from summer BBQ's, beaker mug sales, and coffee prepared

for departmental seminars to name just a few. Also, we raised charitable funds through Run For The Cure and donated over $100 to Martha's Table from funds raised through our Pie-Your-TA-Day event on March 14th.

Per-tradition, we like to give back to our graduate students as much as possible. The annual Winter Formal was held at Aqua Terra this past year featuring a holiday-style buffet with plenty of games, prizes, and good times all around. The QGCS can be seen out at market square skating every winter as well as on the water kayaking in the summer. From bowling, to bi-annual mixers, to karaoke, we like to provide our graduate students with many diverse social outlets. It is the bright minds and welcoming personalities of our graduate students that make all the QGCS's efforts worthwhile. I am honoured to have served you all and once again thank my executive for all their hard work and dedication. With that, I wish the best of luck to the incoming QGCS executive and look eagerly to what the next year holds.

Graduate Chemistry Society

The 2016/2017 elected executives of Queen's Graduate Chemistry Society are: Zach Ariki, President; Josh Clarke, VP Internal Affairs; Sarah Piotrkowski, VP President External; Amy MacLean, VP Finance; Jaddie Ho, Sports Representative; Lucas Choma, 3rd Floor Rep.; Marshall Timmermans, 4th Floor Rep.; Jenny McLeod, 5th Floor Rep; Kelsey Viner, Secretary.

Graduate Student Adventure

by Nausheen Sadiq

Bonjour! Ça va? Merci. Je m'appelle Claude. (My name is not Claude). That is about the extent of French I spoke when I started my three-month journey to France in the spring of 2016.

My experience in Graduate School at Queen's University began when my supervisor and I discussed my interest in travelling to France to work at one of the labs she collaborates with. Her condition was that I would stay for a PhD and mine was simply that I would get to go to France! Well time passed and in 2015 I was fortunate enough to receive three awards that helped fund my trip to France – the Dean's Travel Grant which was given by the School of Graduate Studies at Queen's, the FCRF L'Oreal Canada Award for Women in Science, and the Marie Mottashed Graduate Scholarship given on the basis of academic excellence to female graduate students enrolled in the physical sciences.

With the funds for my trip locked down, I began my adventure on March 1st 2016. This was the first time I had been to France and the first time I was entering a country where the official language was French. My first lab would be ANSES (French Agency for Food, Environmental and Occupational Health & Safety) in the suburbs of Paris. My five weeks at ANSES allowed me to work on the microwave extraction of arsenic, selenium and chromium in rice based foods. As we did not have this instrumentation in our lab at Queen's, it was cheaper to send me to France with my samples – and I had no problem with that! Here, I spent my time working hard, getting results, and presenting as often as possible to my ANSES supervisor. On weekends, I had the chance to travel to Geneva, Rome, the Vatican (where I heard the Pope speak on Easter Sunday) and Pompeii, followed by my final trip to Amsterdam where I learned that bicycles rule the city. From there I was off to Toulouse in the south of France – a small university town not so different from Kingston - where I would spend the next six weeks. The south of France was another incredible experience which allowed me to explore a new part of a country. Finally I headed to Pau, France where I would present my research in French! I will have you know that my French language skills had improved in regards to reading menus and ordering food; however my explanations of complex scientific concepts still required some work. I successfully presented a poster presentation on the speciation analysis of As, Cr and Se in baby rice cereal with a great deal of help from my supervisor in regards to translation (oh, and Google Translate). I was reunited with several members of the ANSES lab in Pau and it was the perfect end to my trip in France.

I returned to Canada realizing that I had become a cliché tourist – carrying bags of trinkets about which I previously wondered "who buys these?" Safe to say, I did. I bought it all. Three months, 9 countries and countless croissants later, I had successfully conquered France. Travelling to Europe was a life changing experience for me both personally and professionally. I was able to explore different cultures, languages and research, and I can't wait to go back to see and learn so much more.

Au revoir, Nausheen Sadiq, Ph.D.

Congratulations to Tucker Carrington

Tucker Carrington received a Humboldt Research Award in 2017. The Humboldt Research Award recognizes research contributions that have had a significant impact and researchers who are expected to continue producing cutting-edge achievements. The Humboldt Foundation grants up to 100 Humboldt Research Awards per year to scholars in any discipline worldwide. Award winners are expected to do research in Germany for at least several months. Dr. Carrington will visit Professor Uwe Manthe at the University of Bielefeld from September to November 2017.

In 2007 Tucker Carrington moved to Queen's, from the Université de Montréal, to accept a Canada Research Chair position. He develops new theoretical and computational methods for computing ro-vibrational spectra of small molecules. He has played a major role in establishing methods that today are workhorses of quantum dynamics. In a recent paper with a research associate, Xiaogang Wang, he reported the first ro-vibrational energy levels of CH_5^+ - a molecule that is not only a superacid but also the simplest carbonium ion. It can be thought of as a CH_3^+ carbenium ion linked with a hydrogen molecule. All five of the H atoms rapidly exchange positions, undergoing a sort of generalized pseudo-rotation. The five hydrogen atoms scramble around the central carbon atom and the molecule has therefore no "structure". CH_5^+ is thought to exist in interstellar clouds where stars and planets form. Molecules in space are often identified on the basis of their spectra.

CH_5^+ has been studied since the 1960s. In 1999, T. Oka and co-workers published the first ro-vibrational spectrum of CH_5^+. The spectrum has baffled scientists ever since. In 2005, Oka wrote in Chemistry and Engineering News: "In 1999 when I published our paper, I believed, it would take at least 20 years to completely understand the spectrum of CH_5^+. It is already six years since then, and there is still no solution in sight. I personally think that 20 years is a gross underestimate". Just one year ago, Oka wrote in Science: "I anticipate that this enfant terrible will be caught in interstellar space far ahead of its theoretical understanding, which will take at least a few more decades.".

In their recent paper, Wang and Carrington use the results of their calculations to re-assign transitions observed in a recent experiment in Cologne, Germany. The experimentalists assumed that they saw molecules of just one parity. The new assignment can only be correct, if molecules of both parities exist in the experiment. Although the new calculations do not yet enable scientists to "completely understand" the spectrum of CH_5^+, they are a large step in the right direction. The calculations are difficult because the usual approach to molecular vibrations is based on a harmonic oscillator model and this model is useless for CH_5^+, due to rapid shuffling of the hydrogens. The long-term goal is to do calculations that are extensive and detailed enough to make it possible to identify CH_5^+ in outer space.

Professor Manthe, whom Carrington will visit in Germany, has also studied CH5+. Together Carrington and Manthe will work on new methods for computing spectra and rate constants and perhaps they will be able to push even further the understanding of CH_5^+, so that experimentalists and astronomers won't have to wait for another two decades.

The Michael C. Baird Lecture Series

The department is pleased to announce a financial campaign to raise funds for the Michael C. Baird Lecture Series. The lecture series is an enterprise initiated by former Baird group members Will Rogers (B.Sc. '77, Ph.D. '80) and Helen Ferkul (B.Sc. '80, M.Sc. '81), who are most pleased to have the opportunity to honor their good friend and former mentor in 2017, the golden anniversary of Mike's arrival at Queen's. See below for information concerning the inaugural lecture in September, 2017.

Mike Baird was raised in Dundas, Ontario, and graduated from McMaster University in 1962 with an Honors B.Sc. in Chemistry. While at McMaster, Mike took time from his studies to win OUAA and CIS intercollegiate sprint championships and to serve as Senior Year President. Mike moved to the University of Toronto for his doctoral studies, completing his Ph.D. in only three years, and then spent two formative and extremely productive postdoctoral years with Sir Geoffrey Wilkinson (FRS, 1973 Nobel prize in Chemistry) at Imperial College, London. During his second year in London, Mike was offered and accepted a position as Assistant Professor at Queen's. He began his career in Kingston in September, 1967, and has enjoyed life here ever since except for a six-month sabbatical leave in 1975 in the laboratory of Otto Fischer (who shared the 1973 Nobel prize with Wilkinson) at the Technische Universität München.

Mike is an outstanding scientist of international stature who has received considerable recognition and acclaim for the breadth and the depth of his interdisciplinary interests. He has worked in a number of quite different areas of chemistry, including fundamental, synthetic and mechanistic organometallic chemistry, homogeneous and heterogeneous catalysis, new anti-tumor drugs (in collaboration with researchers in the Cancer Research Laboratories at Queen's), applications of computational methodologies to organometallic compounds and olefin polymerization catalyzed by organometallic compounds. He prepared many new chemical compounds in the course of his research, and aspects of his mechanistic research are widely recognized and have appeared in text books.

The tremendous novelty of his olefin polymerization work opened up a new field of research and Mike was credited (The Metallocene Monitor, October 1999) by The Catalyst Group, an important American consulting firm, as "above all others, the person who really stimulated interest in (the polymerization of) isobutylene" by organometallic catalysts. They also refer to his first paper in this area as "a key event in generating enthusiasm" for what is becoming a very important field. This research also led to a quite close and well-funded collaboration with Bayer Inc. (now Lanxess), Sarnia, Ontario, in research which may well result in a new commercial process for making tire rubber and other elastomers.

Mike "retired" in 2005 although he continued as an emeritus professor to teach gratis at the undergraduate and graduate levels and to carry out externally funded research. With over 275 peer-reviewed publications, ten patents and numerous invitations to contribute oral conference presentations, book chapters and review articles, he has received almost every significant national award for scholarship in his field including the Alcan Lecture Award, the Catalysis Award and the Catalysis Lectureship Award of the Chemical Institute of Canada. He was also elected to Fellowships of the Chemical Institute of Canada and of the Royal Society of Canada, and received the Queen's University Prize for Excellence in Research. In addition, Mike was elected to the McMaster University Sports Hall of Fame and received the 2015 McMaster University Distinguished Alumni Award.

More than simply an outstanding researcher, Mike is also a much respected teacher who has guided some 90 graduate student theses and 25 postdoctoral research projects. He has taught literally thousands of undergraduate students at all levels during his career at Queen's, with about 350 being introduced to research in his laboratory, and he has been awarded the Chemistry Department Student Council Prize for Excellence in Teaching five times. Mike also coached the Queen's track team for many years and was an inaugural inductee into the Queen's Athletics Coaches Hall of Fame.

Mike Baird is the epitome of that rare breed of professor who both excels in ground-breaking research and takes a serious interest in undergraduate teaching and mentoring. His devotion to both aspects of his profession has inspired generations of students.

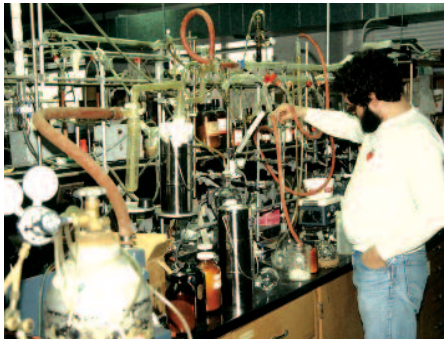
The Inaugural Michael C. Baird Lecture will be presented by Richard R. Schrock, Frederick G. Keyes Professor of Chemistry at the Massachusetts Institute of Technology and Chemistry Nobelist in 2005. Professor Schrock's lecture (title TBA) will be presented on Fri., Sept. 29, 2017.

Chemistry alumni/ae are invited to join us in celebration of 50 years of teaching and research by Mike at Queen's.

See the department's website for further details:

www.chem.queensu.ca

Typical Baird Group in about 2000



Luc Girard in the old Baird lab, Frost 405, in 1990

Congratulations Diane Beauchemin

Congratulations to Dr. Diane Beauchemin for receiving the 2017 Maxxam Award from the Canadian Society for Chemistry. The Maxxam Award, which consists of a framed scroll, is presented to a scientist residing in Canada who has made a distinguished contribution to the field of analytical chemistry while working in Canada. It will be presented during the 100th Canadian Chemistry Conference and Exhibition, which will be held in Toronto from May 28–June 1, 2017.

Dr. Beauchemin moved from the National Research Council of Canada to join Queen's University in 1988 as an Assistant Professor in the Department of Chemistry, where she was promoted to Associate Professor in 1993 and to Full Professor in 2001. Her work involves trace analysis of a large variety of samples – frequently using Inductively Coupled Plasma – Mass spectrometry as the technique of choice. Diane's work has been published in over 100 scientific articles and is widely recognized with several national awards.

Dr. Beauchemin is renowned for finding simple solutions to complex problems that are of relevance to industry and society. All her sabbatical leaves have been sponsored by industry and her students usually have an industrial position lined up by the end of their graduate studies. Several of the approaches that she proposed are now used worldwide. Her contributions include a method to locate under-terrain ore deposits in geochemical exploration, a pragmatic approach to risk assessment of food safety, and a forensic analysis method to identify the source of paint scrapings in hit-and-run cases. The latter resulted in collaboration with the Royal Canadian Mounted Police. Her improvement of the sample introduction system to increase sensitivity without jeopardizing plasma robustness resulted in a broadcasted interview at the 2011 Pittcon tradeshow followed by collaborations with SCP Science (for 6 months) and then Telegistics Inc. (for 2.5 years).

A recent innovation from the Beauchemin group is the development of a quick forensic analysis method to infer gender and ethnicity from head hair by coupling electrothermal vaporization to ICP optical emission spectrometry (OES) and using multivariate analysis to look at the multi-elemental data generated during the 85-second vaporization of a few milligrams of head hair. This was highlighted on the Chemistry World website of the Royal Society of Chemistry, and also resulted in local TV interviews, an interview on CBC Radio "Quirks and Quarks", which was broadcasted nationally and abroad, and an interview for Law Enforcement Technology magazine, a publication for upper management law enforcement readers in the US and Canada. She was also asked to record an "Academic Minute" on this new approach for WAMC Northeast Public Radio in Albany, NY, and write an editorial for Bioanalysis on this subject. While the approach cannot replace DNA analysis, it can provide valuable information to help investigators when DNA analysis is not possible. Indeed, DNA analysis requires the root whereas this new approach allows gender and ethnicity to be inferred from hair without root.

Her most recent innovation is a new flow injection method for the measurement of nanoparticles by ICPMS, where a discrete volume of very dilute suspension is injected so that each aerosol droplet produced during nebulization contains at the most one nanoparticle. The size of the resulting signal spike is proportional to the number of atoms, from which the size of particles (with known density, shape and composition) can be deduced. Her group has measured as small as 3-nm Pt particles.

The entire body of her scientific work was recognized by the Canadian Society for Chemistry when Dr. Beauchemin was awarded the 2017 Maxxam Award.

Ross/Stamplecoskie

Avena Ross

I joined the Department of Chemistry as a Queen's National Scholar in Chemical Biology and Medicinal Chemistry in January of 2015. Having previously completed my PhD in Organic Chemistry at the University of Alberta, I was thrilled to be returning to Canada and enjoyed a very warm welcome from my colleagues and the whole chemistry department (although some may have questioned my sanity, in choosing to move from San Diego, California to Ontario in the middle of the "polar vortex"!) Over the last two years I have thoroughly enjoyed teaching CHEM 212 "Principles of Organic Reactivity" and CHEM 323 "Biological Chemistry" and getting to know the undergraduate students in our department. I have also been busy setting up my research lab, with funding support from the Canada Foundation for Innovation (CFI) and Natural Sciences and Engineering Research Council of Canada (NSERC) in addition to Queen's. Our research is highly interdisciplinary, using techniques and concepts from organic and analytical chemistry alongside biochemistry, microbiology and molecular biology. In collaboration with the Zechel lab, we have acquired state of the art instrumentation that allows us to perform all of these experiments right here in Chernoff Hall. My group currently consists of 2 PhD, 2 MSc and 2 undergraduate students and we study organic molecules made by bacteria that live in the ocean. We are interested in discovering new molecules with useful biological properties that can be applied to treating human disease and we also seek to understand how the bacteria synthesize these molecules.

Kevin Stamplecoskie

I am writing this article as the newest faculty member in the Department of Chemistry at Queen's. It is a great privilege to be given this opportunity as an Assistant Professor, having revered Queen's University and the Department of Chemistry for many years. One of the most rewarding parts of my first year has been lecturing and mentoring undergraduate students. If these are the minds of the future, I believe we are in excellent hands.

My research program resides at the interface between photochemistry and materials research. We use light to make, and study, the fundamental properties of new and emerging materials, which has been a pleasure to share with some very gifted students.

I have also been pleasantly surprised to find that the many faculty members in the Department of Chemistry, with busy schedules and prolific international reputations, have found time to provide me with tremendous support. It is this support that has allowed me to successfully obtain my first NSERC Discovery Grant, as well as Canadian Foundation for Innovation (CFI) funding through the John R. Evans Leaders Fund (JELF). I was also able to initiate collaborations with several companies, one of which has led to an Ontario Centre for Excellence (OCE – VIP 1) grant, in collaboration with Luzchem Research Inc. In this project, we developed an instrument for evaluating photovoltaics (solar cells), with capabilities at the highest international standard (Class AAA AM 1.5G solar simulation). These grants, and the initiation fund from the department, have afforded me the start-up funds, and all of the tools necessary for the successful start of my research program.

I am profoundly grateful for the opportunities that I have been given; to follow my passions in both research, and teaching.

Zechel Lab Receives NSERC DAS Award

Dr. David Zechel and his students have long been in pursuit of some of nature's most unusual enzymatic reactions. After numerous exciting twists and turns in their research programs, the Zechel lab received a NSERC Directed Accelerator Supplement (DAS) on top of a renewed Discovery Grant in the spring of 2016. Only 6% of all NSERC Discovery Grant awardees received a DAS. "We're very grateful for the interest in our research," says Zechel. "This funding will allow us to push much harder in our studies."

The Zechel lab focuses on two seemingly unrelated research topics, the cleavage of carbon-phosphorus (CP) bonds and the synthesis of carbon-halogen bonds. "The motivation in both cases is the discovery of new enzyme mechanisms," says Zechel. "Both types of bonds are relatively unusual in Nature, and therefore signal the presence of cool enzymology."

CP-bonds are found in phosphonates. Although often thought of as synthetic compounds, a surprising number of these molecules occur naturally in the environment. "Microbes synthesize phosphonates for their bioactive properties as well as their inherent stability," says Zechel. "However, microbes are simultaneously starved for phosphate, and so have also created enzymes to cleave CP-bonds so that they can use phosphonates as a phosphate source". In this way phosphonate biochemistry represents a parallel stream within the global phosphorus cycle, where CP-bonds are formed or broken, depending on the needs of the organism.

The Zechel lab made key discoveries that led to the unravelling of CP-lyase. This enzyme pathway had attracted and bedevilled researchers for decades due

to its unusual radical mechanism for cleaving CP-bonds. "Most labs had given up by the time we got involved in 2004 because the enzymes were so difficult to handle," says Zechel. "But we were lucky in choosing a hydrolytic enzyme, PhnP, which was well behaved and relatively easy to study." PhnP turned out to be a key to the CP-lyase pathway, as it recycles one the products formed upon CP-bond cleavage. Following a series of publications by the Zechel lab, the lab of Frank Raushel from Texas A&M finally identified the enzyme, PhnJ, that performed the CP-bond cleavage step, describing this chemistry in two Nature publications. "We never managed to conquer PhnJ. It's a heinously difficult enzyme to work with," says Zechel. "Frank pulled off some of the most amazing enzymology I've ever seen, a complete tour-de-force! Nevertheless, even though we were beaten to the prize, it is good to know that PhnP was pointing us in the right direction."

The Zechel lab is presently investigating a new mechanism for cleaving CP-bonds. "What I love about this project is that it highlights the power of genomics to discover new chemistry," says Zechel. In 2009, the DeLong lab from the Massachusetts Institute of Technology (MIT) discovered the genes phnY and phnZ by screening microbial DNA collected off the coast of Hawaii. The Zechel lab produced the enzymes encoded by these genes and revealed that they cleaved CP-bonds using oxygen and iron. "It was a special moment," says Zechel, "to see this reaction occurring for the first time in an NMR tube." Zechel's students are looking for ways to engineer this pathway to degrade Round-Up, the most commonly used herbicide in the world.

Like phosphonates, organohalogens are also often viewed as synthetic creations. However, the same utility that carbon-halogens find in materials and pharmaceuticals (think Teflon or Flovent) is also appreciated by nature in the form of halogenated natural products. Some of these have important bioactivities, such as the antibiotic vancomycin. The Zechel lab is investigating the biosynthesis of a rare fluorine containing molecule called nucleocidin. "This will be a neat enzyme to play with, as the reaction involves replacing a C-H bond with a C-F bond on a carbohydrate," says Zechel. But the path to this 'fluorinase' enzyme has been a long one. The Zechel lab first had to correct a genetic defect in the producing bacterium to restore biosynthesis of nucleocidin. "This molecule was declared 'extinct' in the 1990s because of this problem," says Zechel. "Now that we have identified the biosynthetic genes for nucleocidin, we believe we have a good chance of finding the fluorinase."

Receiving the DAS award has also highlighted the importance of collaborations to Dr. Zechel. His publications often feature co-authorship by national and international researchers. "Our work is interdisciplinary and we simply can't be experts at everything," says Zechel. "This is where collaboration has been important for our success, as well as enhancing the training opportunities for my students. Fortunately, we have been effective in luring other labs into joining us on our crazy projects." This has also given Dr. Zechel's research greater international exposure, leading most recently to an invitation to write a review for Chemical Reviews as part of a special issue on unusual enzyme reactions. "All of my heroes are in this issue, including the editor!" says Zechel. "I was thrilled to have the opportunity to write about our research field and our role in shaping it."

HOMECOMING 2017

Please join us on
Saturday, October 14th

Starting at 10:30 to 12pm for department tours hosted by the Chemistry graduate students and faculty.

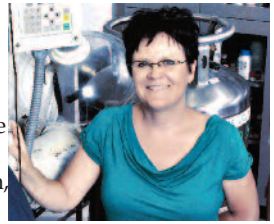
Recent Research in the Crudden Group

The past year has proven another busy one for Dr. Cathleen Crudden. While overseeing a research group at both Queen's and Nagoya University, she also toured Canada extensively, giving lectures in seven provinces over the course of two lengthy recruiting tours in the Fall and Winter. She was also invited to present at conferences in Canada, the United States, Japan, and Taiwan.

2016 saw the end of the six-year CREATE program in Novel Chiral Materials, which she directed. The program was very successful, and it was great to see the 28 graduates from the program doing so well. This year was also successful on the grantsmanship front, with Dr. Crudden being given the largest Discovery grant in Canada for her competition. This is also among the highest allotted to a researcher at Queen's. Part of these funds are helping to maintain a healthy research group currently consisting of four Post Doctoral Fellows, three PhD students, seven MSc students, as well as undergraduate and visiting researchers at the Queen's lab. The research has resulted in ten papers accepted for publication over the past year, two of which appeared in Nature Communications.

As Principal Investigator of the recently awarded $8.8 M Canada Foundation for Innovation award, Dr. Crudden has overseen the purchase of ten of 17 pieces of new equipment thus far. Instruments already installed include a new X-ray photoelectron spectrometer, a new single crystal diffractometer, and a MALDI-TOF mass spectrometer. This summer, we expect delivery of a new 700MHz NMR, which will have solid state capacity exceeding anything available nationally. In Fall 2017, we expect the installation of a state-of-the-art combined scanning tunnelling microscope/atomic force microscope, which is being custom built and is currently under construction in Germany!

Plans are underway to formalize an institute centred around the unique capacity we will have in catalysis and surface analysis once all of this instrumentation is operational. This new equipment will not only facilitate Dr. Crudden's research program, but also that of her nine internal collaborators and many researchers in the department.



Not only has she been busy with writing and publishing articles, but she has also had the opportunity to review many prospective papers in her new role as Associate Editor of ACS Catalysis. This has been a challenging but very rewarding task for her, and with the impact factor of the journal now rivalling that of some of the top general journals, she is enjoying dealing with high quality submissions.

Administrative duties have been reduced significantly since Dr. Crudden was awarded the Killam Fellowship by the Canada Council for the Arts in 2015. This two-year award also relieves awardees from all teaching duties during the award term, leaving them more time to focus on research.

We are excited to announce that Dr. Crudden has recently been made a Tier 1 Canada Research Chair in Metal Organic Chemistry, for a seven-year term. She joins fellow departmental Chairholders P. Andrew Evans, Philip Jessop, Guojun Liu, Jean-Michel Nunzi and Tucker Carrington. This is an exciting new step in her research program!

Dr. Crudden was also awarded the RU Lemieux award for her research in organic chemistry by the Canadian Society for Chemistry for 2017. She is the first female awardee for the 25 year history of the award. Previous winners include many current and former chemistry department faculty, namely Saul Wolfe, Victor Snieckus, Erwin Buncel, and Stan Brown. She will deliver the award lecture at the 100th Canadian Chemistry Conference & Exhibition in Toronto this Spring.

Dr. Crudden is an exciting researcher in our department, and we look forward to seeing what else 2017 has in store for her and her group!

Scholarships and Teaching Awards

The McAdie Chemistry Doctoral Student Award Recipient: Alex Cormier

David Thomas Award 2nd Year Synthetic Lab Recipient: Mona Ashrafkhorasani

4th Year projects winners Lea Gozdzialski (Stamplecoskie Group), Walter MacFarlane Smith Prize in Chemistry; and Rachel Ross (Evans Group), M. Sullivan and Son Limited Scholarship

The Chemistry '60's Scholarship Recipient: Brandon Becher Nienhaus

Friends of Chemistry TA Award Recipient: Sadaf Tahmasebi

William Patrick Doolan Award Recipient: Andrew Fraser

Fisher Scientific Teaching Award for Chemistry Tutorials Recipient: Gurpaul Kochhar

Congratulations to the Class of 2017!

We are pleased to announce that the following speakers have been confirmed for our 2017-2018 Seminar Series. For more information and dates, please visit our website at **http://www.chem.queensu.ca/departmental-seminar-series**

Prof. Nathan Magarvey, McMaster University

Prof. Zhichuan Jason Xu, Nanyang Technological University

Prof. Cosima Stubenrauch, Stuttgart University

Prof. Fraser Stoddart, Northwestern University

Prof. Richard Schrock, MIT

Prof. Jeffery Bode, ETH Zurich

Prof. Polly Arnold, University of Edinburgh

Prof. Gerhard Erker, Universität Münster

Prof. Chao-Jun Li, McGill University

Prof. Nathan Lewis, California Institute of Technology

Prof. Bayram Burcin, Miami University

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