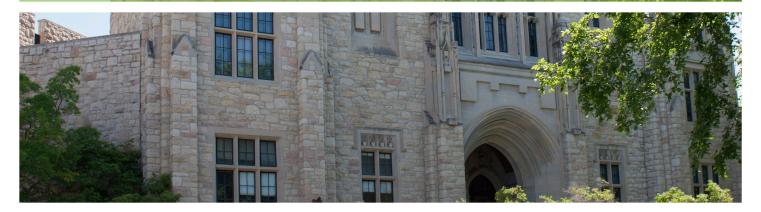


Department of Chemistry Newsletter





Dr. David Palmer Department Head

Hello students, alumni, colleagues, and friends! It's my pleasure to greet you all again this year, and introduce this information-packed newsletter. I resumed my duties as Head in July 2017 after a 6-month break, and was greeted with a 15% departmental budget cut for the year, followed by an additional 10% cut for 2018-19. While this is going to make maintaining our programs much more challenging, we have not slowed down in our mission to be the best that the U of S has to offer. Our department remains a hub of campus activity and a hive of teaching and research. We have graded over 4000 exams this year, instructed more than 10,000 hours of laboratories, and worked with over 100 graduate students, postdoctoral fellows, research associates, technicians, and undergraduate research students.

While we teach a lot of students from

across campus, we have a group of chemistry majors of which we are very proud. Watching them learn to carry out experiments in the senior research labs is one of the most rewarding parts of the job. I had conversations with some at convocation this year, in which I learned about their next steps to medical and dental school, graduate school, and jobs in chemistry. We take so much pride in our students and the success that their hearts and minds and efforts bring them.

We have also encountered increasing numbers of students who are unprepared for university chemistry, and we have created a new course (CHEM 100) to try to meet their needs. We hope that this, other bridging programs, and our outreach activities with high schools and other groups can bring success in chemistry to more students.

Every year brings changes, from new and graduating students to new and retiring professors, but this year was a big one for turnover. We saw four retirements:ProfessorMarekMajewski, Dr. Keith Brown, Garth Parry, and our long-time office stalwart, Ronda Duke. In addition, our graduate assistant

Leah Hildebrandt has decided to pursue her bachelor's degree full time, so she too is leaving us. All of these people will be greatly missed by the department. On the other side of the coin, a new faculty member has been hired, and I'm thrilled to welcome Dr. Tara Kahan to the department; you can read more about her and her research in the following pages. This addition is particularly timely given the activity of our new Women in Chemistry initiative, also described in this newsletter.

In closing, remember that the Department wants to hear from you! We work to discover new chemistry and teach our subject to generations of students, and our greatest achievement is your success. Please be in touch, whether by e-mail, Facebook, Twitter, or best of all, a visit to campus.

I will take this opportunity to thank once again all the donors who have helped the department to give the best experience we can to all our students. And to all the U of S Chemistry community, please accept my best wishes for the year ahead.



Retirements R 4. EN

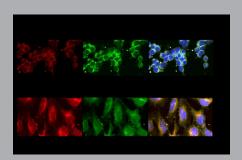


Faculty News

Chris Phenix is leading a multidisciplinary team to develop imaging probes for glucocerebrosidase (GCase), an enzyme which has been indentified as a top priority diagnostic biomarker and therapeutic target of Parkinson's disease. The multidisciplinary team includes professors Darrell Mousseau (Pathology, U of S), Rebecca Davis (Chemistry, U of M), David Palmer (Chemistry, U of S) and Justin Hicks (Lawson Research Institute). Early work has led to the development of novel conduritol aziridines, which are potent, selective and irreversible inhibitors of GCase discovered by the Phenix group.



Photo: Debra Marshal



Current work is focused on evaluating a new fluorescent probe for GCase as well as synthesizing radioactive derivatives that are likely to enter the brain. If successful, the team hopes to study disease-promoting processes related to GCase as well as to help develop new drugs to treat Parkinson's in early stages. For this project, Phenix has received funding from GlycoNet and SHRF, along with in-kind support from Lysosomal Therapeutics and the Sylvia Fedoruk Centre (Saskatchewan Centre for Cyclotron Sciences).



Andrew Grosvenor was awarded the U of S New Researcher Award at the Fall 2017 Convocation. Research conducted by the Grosvenor Group is focused on improving the viability of nuclear energy. The Grosvenor Group studies multiple aspects of the fuel cycle, including: (1) studying U mine/mill wastes in collaboration with Orano Canada (formally AREVA Resources Canada); (2) studying inert matrix oxide (nuclear) fuels in collaboration with Canadian Nuclear Laboratories (CNL); and (3) the development of materials for the safe sequestration of nuclear waste. Students and researchers involved in this research program synthesize materials using a variety of solid state methods and investigate natural and synthetic samples using a large number of advanced lab- and synchrotron radiation-based characterization techniques (e.g., X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), X-ray microprobe, X-ray absorption near edge spectroscopy (XANES), and Extended X-ray absorption fine structure (EXAFS)). The synchrotron radiation experiments are primarily performed using the Canadian Light Source (CLS).

New Faculty



We are excited to announce that **Tara Kahan** will be joining our department August 1, 2018, as Associate Professor and nominee for Canada Research Chair in Analytical and Environmental Chemistry. Dr. Kahan obtained her BSc at the University of Regina in 2004 and her PhD

at the University of Toronto in 2010. She joined Syracuse University in 2012.

Dr. Kahan is an emerging expert in the field of atmospheric and environmental chemistry, focusing on chemistry in aqueous environments, chemistry at ice surfaces, and the chemistry of indoor atmosphere. This includes the study of organic pollutants and their reactions in surface waters, droplets and aerosols, as well as on ice surfaces.

Her work has been funded by the Sloan Foundation and the National Science Foundation, and she has received the Meredith Teaching Award honouring oustanding teaching by a young faculty member at Syracuse University.

Faculty Promotions

The University's Board of Governors approved promotions to Full Professor for **Michel Gravel** and **Andrew Grosvenor**, effective July 1, 2018.





Faculty Milestones



As of 2018, **Soledade Pedras** has been with our department for 25 years. She received a U of S Long-Service Award on May 29.

Richard Bowles and **Jens Mueller** have been faculty members in our department for 15 years.







Faculty News

David Palmer was appointed to a three-year term on the NSERC Discovery Grant Evaluation Group for Chemistry.

Faculty Retirement



After 33 years with the Department of Chemistry, **Marek Majewski** has retired, as of June 30, 2018.

Dr. Majewski studied at Warsaw Technical University, and completed a PhD at University of Waterloo with Victor Snieckus, followed by postdoctoral work at the University of Alberta and the National Research Council.

He joined our department as an Assistant Professor in 1985, received tenure as an Associate Professor in 1990, and was promoted to Full Professor in 1995. He was Director of the Saskatchewan Structural Sciences Centre from 2004-05, and held the position of Department Head from 2005 to 2011.

Dr. Majewski taught organic chemistry throughout his career and supervised eleven MSc and seven PhD theses. He co-authored six book chapters and 56 peer-reviewed publications, focusing especially on stereoselective reactions of enolates. He will be fondly remembered for all his contributions to the department!

Staff Retirement

Garth Parry retired from his position of Electronics Technician as of January 26, 2018. Prior to joining the Department of Chemistry in 1999, Garth worked in the College of Agriculture. We will miss Garth's steady presence in the electronics shop and his ability to fix seemingly anything, and we wish him a restful and relaxing retirement.



Staff Retirements

Ronda Duke began her career at the U of S in the Department of Chemistry in 1979 as a half-time clerk in Stores. Ronda supported many areas of the department, from the main office, assisting with first year labs, to a full-time role supporting faculty and graduate student programs.





She became the Department Head's Secretary in 1999, a position she held until her retirement on April 30, 2018. Ronda's patience, friendly smile, and vast knowledge of the department will be greatly missed.

Keith Brown retired from the department on March 31, 2018. He held the position of Research Officer with the Saskatchewan Structural Sciences Centre, and was also a Chemistry 112 instructor. Retirement will no doubt provide Keith more time for jam sessions with his band.



2018 Taube Medalist - Dr. Quang Huy To



The 2018 Taube Medal was awarded to Quang Huy To who has recently completed his Ph.D. degree under the supervision of Dr. Soledade Pedras. Huy's work on the discovery of unique plant defenses (the "nasturlexin family") and their biosynthetic pathways are landmark achievements. Huy was successful, first, in determining the chemical structures of several new natural products (that are always produced in trace amounts), second, in chemically synthesizing these compounds, and third in demonstrating their antifungal activities against important pathogens of canola and related crops. The discovery of the cruciferous phytoalexins nasturlexins A and B together with cyclonasturlexin and brassinin in watercress plants, revealed the co-occurrence of two parallel defense pathways, the tryptophan pathway and the phenylalanine pathway.

Outstandingly, Huy's work was also rewarded with some sort of serendipity, as he discovered a family of signalling compounds that are involved in cell to cell communication inside the plant. This work is important as it established the ecological roles of new natural products useful to protect crops from microbial diseases.

The final stage of Huy's doctoral work involved the discovery of pathways by which these natural defenses are constructed, that is the discovery of the precursors and specific transformations used by plants to build these natural defenses. Huy worked on the biosynthetic pathways of

nasturlexins in cress plants using isotopically labeled compounds and discovered that, except for the carbon atom of the thiomethyl groups of nasturlexins, homophenylalanine is the origin of all carbon and nitrogen atoms. Based on this work, a detailed map of the biosynthetic intermediates of nasturlexins in upland cress, winter cress and watercress was established. A detailed chemical understanding of biosynthetic pathways of plant defenses, such as the nasturlexins, facilitates their metabolic engineering in other plant species. An application beyond these findings could lead to "designer crops" containing a wider range of chemical defenses that could make such crops more resistant to pests and diseases, a greatly advantageous trait to prevent the use of fungicides.

2017-18 Award Recipients

Sajna Simon (PhD student, Burgess Group) - won 2nd place in the U of S Three-Minute Thesis competition

Naheda Sahtout (PhD student, Sanders Group) - as part of the U of S Canada 150 Project, was honoured as a remarkable member of the University community and recognized for her extensive volunteer work with minority groups and dedication to supporting newcomers to Canada.

Hridaynath Bhattacharjee (PhD Student, Mueller Group) photo won 2nd place in the @usaskArtSci 1Day contest

William Barrett (MSc Student, Scott Group) - won 1st place poster prize at the 25th Canadian Symposium on Catalysis

Chase Radford (PhD student, Kelly Group) - won a CIC Materials Division Poster award at the 2018 Canadian Chemistry Conference and Exhibition

 $\label{lem:analytical} \textbf{Nathan Regnier} \ (BSc'18) - awarded \ Most Outstanding \ Graduate in Chemistry, Spring Convocation$

Elaheh Khozeimeh Sarbisheh (PhD '17) - received a SHRF 2017-18 Postdoctoral Research Fellowship

Kaiyang Tu (PhD Student, Burgess Group) - won 1st place poster prize of the surface science division at CSC 2018

Thee Prasertanan (PhD Student, Palmer/Sanders Group) - won a best poster presentation prize at the 2018 Protein Structure, Function and Malfunction meeting.



Nathan Regnier (BSc'18) received the \$6000 Robert A. Fuller Memorial Scholarship, 2017-18



Recipients of the 2017-18 \$6000 Harold Ross Saddington Memorial Scholarship were (L to R): **Jenny Panchuk, Karn Parmar, Brandon Dessert,** and **Bryden Hughton** (pictured with department head David Palmer)

Chemistry Students' Society (CS2) Update

The Chemistry Students' Society enjoyed another busy year filled with plenty of social and academic events organized by the executive members. The Undergraduate Research Night saw success again, with the department gaining a few undergraduate summer researchers from the event. Our members enjoyed the annual Trivia Night and Year End Bowling Party, along with the awesome prizes that were won.

2017/18 CS2 Executive
President: Bryden Hughton
VP Internal: Mars Zhao
VP Financial: Shivani Tauh
VP External: Jarvis Stobbs
VP Academic: Nathan Regnier
VP Social: Morgan Moss
VP Admin: Kathleen Coyne

Congratulations to the recipient of the student-elected Outstanding Teacher Award, Dr. M. Soledade C. Pedras! Her enthusiasm and efforts in teaching were appreciated by all her students.

The current executive wishes all the best to the CS2 members who will be convocating in June. Have a wonderful summer, and see you all in September!

Chemistry Course Council (CCC) Update

2017/18 CCC Executive
President & Union Meeting
Representative: Tyler Morhart
Treasurer: Rick Pettipas
Secretary & Research, Scholarly, and
Artistic Works Committee:
Natasha Vetter
Public Relations & Department
Meeting Representative: Kaiyang Tu
GSA Representative: Douglas Fansher
Safety Committee Meeting
Representative: Arthur Situm
CS2 Representative: Brandon Chivers
Members at Large: Naheda Sahtout,

Kelly Summers, William Barrett

Thanks to everyone who participated over the last year in our CCC events. As always, we had a wide range of events. Special thanks to our professional development seminar speakers, Heather McWhinney and Rebekah Bennetch.

Holiday events were very successful this year. Interlaboratory rivalries were high during the Annual Pumpkin Carving Competition. Although the 2017 Holiday Party was well-attended and greatly enjoyed, spirits were damped after the Holiday Door Decorating Contest was deemed a fire hazard and thus cancelled. Nevertheless, the CCC soldiered on and put on two days of Career Talks featuring

speakers Drs. Roger Prince and Dwayne Miller. The CCC salutes Naheda Sahtout who almost single-handedly organized the event. She was also recently elected to the office of GSA President. Congratulations Naheda! We look forward to your wise and benevolent rule. Finally, the CCC wishes everyone a productive summer and invites you all to do glorious photonic battle at our summer laser tag event.



Naheda Sahtout (PhD Student, Sanders Group) has been appointed President of the Graduate Students' Association for the 2018-19 academic year.

Recent Graduates

Fall 2017

Bachelor of Science 3 Year

Ugbana Mesharck

Bachelor of Science Honours

Kaylee Thomson

Master of Science

Jose Esteban Flores Ebenezer Gwirah Dexu Kong Elham Paknahad

Doctor of Philosophy

Pouyan Haghshenas Yali Yao

Spring 2018

Bachelor of Science 4 Year

Riak Aruei Mingze Gu Atikin Hehn Bryden Hughton Nathan Regnier

Bachelor of Science Honours

Landon Balkwill Sydnie Gengler Syed Naqvi Jenny Panchuk

Master of Science

Christa Blaquiere Zhongquan Chen Michael Danquah

Doctor of Philosophy

Phan Thuy My Cao
Kianoosh Poorkazem Afarmejani
Mohamed Ruwaid Rafiuddin
Nicholas Randell
Hiwa Salimi
Quang Huy To
Inimfon Udoetok



Top Row, L to R: I. Pickering, K. Summers, E. Khozeimeh Sarbisheh, B. Hughton, S. Gengler, J. Panchuk. Bottom Row, L to R: P. Aigbogun, M. Dominguez Garcia, S. Tauh, A. Al-Heetimi, W. Shannon, B. Lukan

Women in Chemistry

The Women in Chemistry group at the University of Saskatchewan (WIC-USask) was initiated last year with the goal of advocacy and support for minority groups. WIC-USask acts as a member resource group at the student level to provide a channel for member voices to be heard by policy makers at the University.

With support from the Chemistry Department, the College of Arts and Science, and the U of S President's office, WIC-USask was able to organize several events during the past year, including a panel discussion, a workshop on how to access different resources available

to students at the University in case of harassment or other difficulties, and a movie night to motivate students to follow their goals and never give up.

We had an invited speaker from Cape Breton University, Dr. Stephanie MacQuarrie, who is an active member of Women in Science and Engineering (WISE) as well as the Science, Technology, Engineering, and Math (STEM) group. In addition, we had a meeting and dinner with the Spinks Lecture invited speaker, Prof. Christina White from the University of Illinois at Urbana-Champaign, in order to familiarize WIC-USask members with how to break boundaries and be the top person in their field.

We were able to connect with not only students from the Chemistry Department, but also with students from the Biochemistry, Biology, Geology, and Physics departments as well as the College of Engineering. WIC-USask, WICTO (Women in Chemistry at the University of Toronto), and UAlberta WIC are the only WIC groups in Canada, and we have formed a Canadian Women in Chemistry (CWIC) group in order to stay connected and act as an Equity, Diversity, and Inclusion (EDI) framework. We will continue to organize more events and bring more students under this umbrella. *C-USask, Elaheh Khozeimeh Sarbisheh*

Emerging Leaders for Solar Energy USask



L to R: William Elcock, Rick Pettipas, Karnjit Parmar, Anindya Ganguly, and Arpita Deb

Also formed this year is an outreach group that aims to bridge the gap between people and solar cell technology. The key to getting the most out of any technology is understanding how it works. The group's goal is to pave the way toward a sustainable future by serving as a public resource where people can feel comfortable asking questions about solar panel technology. In the process, members within the group gain valuable experience giving presentations, have access to all past presentations that have been given, and can learn about new types of solar panels.

Alumni Updates

Demyan Prokopchuk (BSc '09) has obtained a faculty position at Rutgers University.

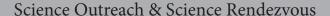
Marek Majewski (BSc '07) has obtained a faculty position at Concordia University.

Michael Gaultois (MSc '12 Grosvenor Group) is now employed as a Research Fellow at Leverhulme Centre for Functional Material Design at University of Liverpool.

Pouyan Haghshenas (PhD '17, Gravel Group) is now employed as a Scientist at Paraza Pharma in Saint-Laurent, Quebec.

Karen Thai (PhD '12, Gravel Group) is now employed as a Scientific Evaluator for Health Canada in Ottawa.

Mita Dasog (BSc '09) has been named one of the Top 150 Canadian Women in STEM fields, 2017, by hEr Volution.





All too often, elementary and high schools simply don't have the facilities or resources to conduct the kinds of activities that we are able to do in a lab on campus, so outreach activities in our department are alive and well thanks to the volunteer activities of many faculty, staff and graduate students in the department. These activities foster connections with the surrounding community, promote engagement with teachers, can kick-start an interest in science at a very young age, and can help to improve appreciation and understanding of chemistry in the general public.

For several years now, the department has partnered with the College's Science Outreach office to provide field trips for grade 4-6 students in the Nutrien

Kamskénow program. This program provides weekly in-class hands-on STEM activities to Saskatoon's community schools with the long-term aim of increasing the participation of Indigenous people in the sciences. The culmination of the 13-week session is a field trip to campus in December, where students spend time in a student chemistry lab exploring some quirky matter such as hydrophobic sand and instant snow.

The spring brings its own whirlwind of students to campus for the Museum of Natural Sciences Outreach program. Saskatoon elementary and high schools can choose from a variety of free 2-hour sessions: everything from Bubble Solids to Computational Game Design. In our department, we offer the popular Cool Chemistry session for elementary students once a week in May and June. Students explore chemical reactions, make potions, and examine dry ice and liquid nitrogen. The students are full of questions and ideas, and enjoy the hands-on nature of the activities.

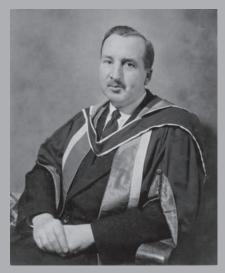
Our graduate students also participate in the popular Science Rendezvous held in May annually. The event includes activities from several departments on campus and our graduate students helped to organize nine separate demonstrations and hands-on activities this year for hundreds of families including examining fuel cells and hydrogen-filled soap bubbles, making liquid nitrogen ice cream, and presenting a Chemistry show filled with coloured flames and explosions.

For the past several years, our department has also been host to activities designed to increase interest in science and chemistry for young women. We have led activities for Discover STEM and Sci-fi Girl Power for girls in grades 5-8 through the Sci-fi Camp program and have hosted some Girl Guide units in activities involving chemistry and physics. The girls get a chance to investigate materials that glow in the dark, determine pH of common substances using pH electrodes and discover how to make a simplified hot or cold pack. They are excited to work with the various equipment in the labs, and often want to take photos to share with their parents and siblings.



The department also occasionally hosts ad hoc visits and tours for elementary and high school classes. In one case, a previous alumna, Krysta (Dmytryshyn) Wenaas, brought her Rosetown Chem 30 class to her alma mater to tour the CLS and do some hand-on activities in the department. We also recently partnered with the department of computer science and the Let's Talk Science group on campus to offer a STEM day for grades 5-8 gifted education students from Greystone Heights. These students spent the day exploring Conway's Game of Life, discovering Fibonacci numbers, maximizing container volumes, and creating sun-developed cyanotype prints.

2018 J.W.T. Spinks Lecture



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

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

The 2017-2018 Spinks Lecturer was **Professor M. Christina White** from the University of Illinois at Urbana-Champaign. Prof. White presented two lectures on November 2-3 on the topic of functionalization of C-H bonds using synthetic methods.

In the first lecture, a general approach for the site-selective oxidation of C(sp³)-H bonds using iron complexes was presented. This approach allows the functionalization of complex molecules featuring multiple possible oxidation sites in a predictable manner, even in the absence of directing groups.

In the second lecture, the use of palladium complexes to perform C-H bond oxidations was highlighted in the context of natural product synthesis. This method was notably applied to the synthesis of the erythronolide family of antibiotics. In addition to these lectures, Professor White engaged in lively discussion with members of the department, including with the recently created Women in Chemistry



group. The department's faculty were delighted by the number and quality of questions from students at the end of each lecture.



Professor M. Christina White with Department Head David Palmer

The Samuel and Ethel Brown Memorial Fund for Chemistry

Weldon G. Brown was born in Saskatoon in 1908 and completed both his bachelor's and master's degrees in chemistry at the U of S by age twenty. After a PhD at the University of California and postdoctoral experience in Europe and America, Dr. Brown enjoyed a long career in the Department of Chemistry at the University of Chicago, where he became known for the invention of paper chromatography and pioneering work on lithium aluminum hydride reductions. Dr. Brown, as a distinguished alumnus from our institution, was presented with a Doctor of Laws degree by Dr. T. Thorvaldson at the U of S Golden Jubilee Convocation ceremony in 1959.

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

The Samuel and Ethel Brown Memorial Fund provided \$10,260 in financial support in 2017-18 to support 28 graduate students and one post-doctoral fellow to travel to specialized conferences to report on their research. Conferences attended included the Liquids 2017 10th Liquid Matter Conference in Ljubljana, Slovenia; the 12th International Conference of Heteratom Chemistry in Vancouver; the LOGIC Retreat 2017 in Toronto; and other conferences and symposiums in Banff, Montreal, and Edmonton.

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

We would love to hear your feedback about our newsletter.

Please email chem.dept@usask.ca.

The Wilson and Florence Quail Fund in Chemistry

Dr. Wilson Quail was a faculty member in the Department of Chemistry for 39 years before retiring in 2003. He enjoyed this long career as an inorganic chemist and crystallographer, studying everything from metal fluorides to proteins. He continued to work as an emeritus professor in the Saskatchewan Structural Sciences Centre for over a decade, collaborating with researchers in the department. He and his wife Florence sent all their children to the U of S, cementing a strong relationship between the university and the Quail



family. Last year, Wilson and Florence agreed to a generous gift to the department, with the goal of helping new faculty with their research. The Wilson and Florence Quail Fund can provide up to \$40,000 per year, and can be awarded to faculty within three years of appointment, or within ten years of their PhD. For 2017-18 four faculty members were eligible and submitted requests for funding. The funding committee agreed to award \$10,000 for research equipment purchases to **Professors Andrew Grosvenor, Tim Kelly, Chris Phenix, and Eric Price.** The department asks everyone to join us in thanking the Quails for their generosity and support of Chemistry. For information on how you can support research, teaching, and student experience in the Department of Chemistry, please contact the department head.

Save the Date! 2018-19 J.W.T. Spinks Lecture Series

Join us on April 25 and 26, 2019, when the next J.W.T. Spinks Lecture Series will be given by **Dr. Chris Chang** from the University of California, Berkeley.



Staying Connected



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

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