

Newsletter

Summer 2022 Issue 8



DEPARTMENT OF CHEMISTRY

A Message From the Head



Matthew Paige

Dear colleagues and friends,

With another challenging but rewarding academic year complete, the Department has a lot to celebrate and to share with you. Despite the ebb and flow of the ongoing pandemic and its impact on our ability to run our programs, we have delivered our undergraduate program to thousands of students; written and defended top-quality graduate theses; conducted innovative research across a variety of chemistry disciplines; and contributed to impactful scientific outreach. The sudden “pivot” to remote teaching in the start of winter term made for a particularly difficult start to the new year, but our students, faculty and staff once again rose to the challenge. Budget cuts at the College and University level continue to rear their heads and impact our ability to achieve excellence in research, and our ongoing support from alumni and donors continue to be crucial to our

success, particularly in terms of financial support for our graduate students. Despite this all, we have not only survived but thrived. Signs of a return to pre-pandemic conditions are starting to appear, including the first in-person Canadian Chemistry Conference and Exhibition (aka. CSC meeting) in three years, held in Calgary this June.

Some of the remarkable accomplishments, all done under highly unusual circumstances, are outlined in the newsletter below. Particularly noteworthy are the admission of Prof. David Palmer as a Fellow of the Canadian Institute for Chemistry; and the first ever delivery of the new chemistry classes Chem 142 and 146 for the College of Engineering, all which are described in detail. In terms of plans and outlook for the upcoming academic year, we have a number of important initiatives to look forward to.

(continued on p.2)

BE WHAT THE WORLD NEEDS

CONTENTS

New Courses for Engineers	3
Taube Medal	4
Women in Chemistry	6
Research Spotlight	8

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Faculty & Department News



CIC Executive Director Josephine Tsang and David Palmer

David Palmer was named a 2022 Fellow of the Chemical Institute of Canada (FCIC). CIC Fellowship is a senior class of membership that recognizes the merits of CIC members who have made outstanding contributions across multiple areas. Dr. Palmer joined the Department of Chemistry in 1999, following a BSc and PhD at Queen's University and a PDF at the University of Illinois, Urbana-Champaign. His research in enzyme catalysis has led to discoveries in enzyme structure-function relationships, antibiotic biosynthesis, inhibitor design, and chemoenzymatic synthesis. He served as Department Head from 2010-2019; as Chair of the Biological and Medicinal Chemistry Division of the CSC in 2005-06, as a conference and symposium organizer; as a four-year member of the NSERC Discovery Grant Evaluation Group for Chemistry (two as co-chair); and as a faculty advisor to the LOGIC conference in 2019. Dr. Palmer is recognized as a dedicated teacher and proud mentor of present and future scientists, teachers, and leaders. Congratulations Dr. Palmer!



Chris Phenix received the 2022 Saskatchewan Health Research Foundation (SHRF) Early Career Impact Award. The award is presented to one researcher per year for their work since being granted a SHRF Establishment Grant five years earlier. Dr. Phenix and his group are working to develop radiotracers to detect Parkinson's disease.

Head's Message continued...

Our undergraduate program reform, which has been slowed by the pandemic, will shift into high gear. New teaching initiatives, including flipped classrooms and new electronic sensor platforms for undergraduate laboratories will "go live" and as always, exciting breakthroughs in research are unfolding daily.

I continue to be amazed at the resilience, work ethic, and high spirits of everyone in the department and thank you all once again for your perseverance. We hope you are all well and welcome all our alumni to keep in contact with us as the year progresses. Please stay connected and accept our best wishes for a healthy and successful year.



The University's Board of Governors approved tenure and promotion to Associate Professor for **Eric Price** and renewal of probation for **Amy Stevens**, effective July 1, 2022.

Congratulations to recipients of 2022 NSERC grants! Discovery Grants were awarded to **Tim Kelly** (\$310,000); **Chris Phenix** (\$180,000); **David Sanders** (\$170,000); and **Ingrid Pickering**, Associate Member (\$310,000). Research Tools and Instrument Grants were awarded to **Tara Kahan** (\$122,503) and **Tim Kelly** (\$149,042).

The first Intensive Workshop on Atmospheric and Environmental Chemistry (IWAEC) was held in July 2021. Co-developed by **Tara Kahan**, this online workshop provided over 50 graduate students from across the world with instruction on concepts important to atmospheric chemistry including photochemistry, atmospheric modelling, surface chemistry, and particle nucleation.

As of 2022, **Valerie MacKenzie** (Analytical and Physical Lab Manager) and **Matthew Paige** (Head and Professor) reached the milestone of 20 years in the department, and **Bonita Wong** (Finance and Operations Manager) reached 10 years in the department.



Valerie MacKenzie



Matthew Paige



Bonita Wong

Chemistry Outreach



What a great return to outreach activities in 2021-2022! We were able to host several hundreds of students in our Department of Chemistry labs again this year, and the sound of laughter and wonder once again filled our laboratories.

Spring 2022 allowed us to safely bring both elementary and high school students from various programs such as Nutrien Kamskénow, Museum of Natural Sciences Outreach program, Girl Guides, and school field trips. These students were able to enhance their science and chemistry learning from the classroom and try out hands-on chemistry experiences.

This was a joint effort by lab staff who all took part in setting up fun and interactive activities and demonstrations. For example, there were redox reactions and catalysts with elephant toothpaste, explorations of physical states of matter by crushing flowers dipped in liquid nitrogen and discussions of the importance of pH by making potions that bubble away and change colour with dry ice.



We hope that 2022-2023 will allow us to continue bringing the fun and excitement of being in an actual chemistry laboratory to many more Saskatchewan students and outreach groups.

New Organic Chemistry Open Text

The instructors for introductory organic chemistry courses (CHEM 250 and CHEM 255) have decided to adopt free, open resources to gradually replace commercial textbooks and other resources. In addition to significant savings for students, this approach allows instructors to tailor the content of the courses to their specific needs more easily. The first step in this multi-year project consisted of assembling a textbook for the course CHEM 250. **Steven Langdon**

(PhD'18) was hired for this task, and he was able to write a textbook in a relatively short timeframe. Thanks to this excellent effort, his free and open book will be used in CHEM 250 starting in September 2022. The next step of the project is to incorporate the book into the Canvas learning management system and other online platforms. Being an open resource, it will also be available for non-commercial purposes to anyone in Canada and abroad.

New Courses for Engineers

The 2021-2022 academic year allowed for laboratories in all courses to transition back to in-person offerings (with minor adjustments such as face masks, increased cleaning protocols, and social distancing). It also marked the replacement of CHEM 114 with three new chemistry course modules for engineers (as part of the new first year Engineering initiative).



Ian Burgess and **Tom Ellis** spearheaded the creation of new and targeted content for CHEM 142 and CHEM 146 designed for approximately 400 - 500 first year Engineering students. In addition, **Adrian Clark**, **Alex Bartole-Scott**, and **Levent Inci** organized a completely new lab space, prepared new experiments in IR absorption and greenhouse gases to coincide with content in CHEM 142, and introduced new data acquisition systems for remote and in-person labs in CHEM 146.

Both students and TAs faced challenges in returning to in-person laboratories in Winter 2022 as the past two years saw diminished laboratory experiences province-wide. However, within a few weeks, students were more comfortable working in groups and developing crucial introductory lab skills in solution preparation, titration, calorimetry and kinetics.

Students continuing in the Chemical Engineering program participated in an intensive three-week CHE 113 module in April that involved the development of new investigation-style labs focused on flotation, rapid solid-liquid extraction and distillation techniques intended to introduce students to the differences in small-scale versus large-scale industrial processes.

Taube Medal



2022 Taube Medallist

Dr. Tyler Morhart

The 2022 Taube Medal was awarded to Tyler Morhart who defended his PhD in the summer of 2021. The Taube Medal is awarded to the graduate student in the Department of Chemistry who is judged to have made the most significant overall contribution to research and scholarly activity.

Tyler's thesis developed the spectroscopic platform necessary to perform surface-sensitive, time-resolved infrared measurements in the milli- to microsecond regime. Such measurements are key tools for assessing important electrochemical processes such as fuel cell reaction mechanisms, electrocatalytic conversions, and battery performance. Working extensively at the mid-IR beamline at the Canadian Light Source (CLS), Tyler helped build a new end station for infrared spectroscopy and imaging. In his thesis, Tyler described the design of a customized horizontal attenuated total reflection microscope and demonstrated its abilities by both a) imaging simple chemical reactions and b) performing surface sensitive IR spectroscopy of an electrode surface with unprecedented temporal resolution.

Tyler's thesis work resulted in five first-author papers, three secondary author papers, and several thesis excellence awards, including the Taube Medal. The microfabrication and design skills Tyler learned during his PhD led to Tyler's current position as the acting beamline responsible for the SylMAND facility at the CLS.

Chemistry Student Awards

Herzberg Thesis Acceleration Award

Shvan Raheem (\$17,166.72) (PhD student, Price Group)
Doug Fansher (\$8,583.36) (PhD student, Palmer Group)
Chase Radford (\$8,583.36) (PhD '22)

Herbert Percy Toop Memorial Prize in Scientific Writing (\$9,120)

Natasha Vetter (PhD'22)

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

Shaoyan Wang (BSC Hon student)
Farah Mahmood (PhD student, Grosvenor Group)
Michael Nicklin (PhD student, Kahan Group)

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

Abby Unrau (BSc Hon student)

Herzberg Scholarship (\$5,000)

Nicole Boyle (MSc student, Burgess Group)

Jackfish SEC Award (\$5,000)

Vi Phan (PhD student, Burgess Group)

CC Lee Bursary (\$3,000)

Doug Fansher (PhD student, Palmer Group)

Herzberg Doctoral Promotion Award (\$2,000)

Vi Phan (PhD student, Burgess Group)

Patricia Currie Award (\$1,000)

Jane Polley (BSC Hon student)

Thorvaldson Scholarship (\$800)

Shaoyan Wang (BSc Hon student)

Dr. O. Kenneth Johannson Scholarship (\$500)

Braeden Dessert (PhD student, Foley Group)
Josh Gramlich (PhD student, Bowles Group)
Farah Mahmood (PhD student, Grosvenor Group)
Shvan Raheem (PhD student, Price Group)
Kazeem Sulaiman (PhD '22)

USask Graduate Thesis Award: PhD in Physical and Engineering Sciences (\$500)

Tyler Morhart (PhD'21)

Governor General's Gold Medal Award

Tyler Morhart (PhD'21)

Canadian Society for Chemistry Silver Medal

Abby Unrau (BSc Hon student)

Undergraduate Summer Research

In summer 2022, the department welcomed 17 undergraduate research students.

Research students included recipients of the following awards:

NSERC USRA

William Ahiahonu (PHARMD student)

Emjay Koller (BSc CHEM student)

Brayden Tumac (BE CHE student)

John and Mary Spinks Summer Research Award

Tanish Patel (BSc PHPC student)

Jane Polley (BSc Hon CHEM student)

Bdhanya Ramaswami (BSc CHEM student)

Alan C. Nixon Summer Research Award

Deborah Achuonye (BSc Hon BIOC student)

Sandra LeBlanc (BSc Hon CHEM student)

Jonathan Nakhleh (BSc Hon CHEM student)

Department of Chemistry/Saskatchewan Structural Sciences Centre Award

Het Sisodiya (BSc PHPC'22)



2022 Undergraduate Summer Research Students. Top row (l to r): W. Ahiahonu, B. Tumac, A. Ahat, T. Patel. Third row (l to r): D. Letwin, E. Koller, J. Polley, S. Muhammad. Second row (l to r): B. Ramaswami, J. Nakhleh. Front row (l to r): D. Achuonye, S. LeBlanc, H. Sisodiya, A. Tirado Baca.

Missing: J. Brausin Varon, J. Singh, H. Yang

Recent Graduates



Photo credit: University of Saskatchewan

(l to r): Professor Rob Scott, Kazeem Sulaiman (PhD'22), Natasha Vetter (PhD'22), Dalia Ahmed (PhD'22), Tyler Morhart (PhD'21), Professor Dave Palmer

Fall 2021

Bachelor of Science 3 Year

Courtney Hryciuk

Master of Science

Theo Olumori

Doctor of Philosophy

Venkata Garapati

Tyler Morhart

Chen Xue

Spring 2022

Bachelor of Science 4 Year

Tiancheng Zhang

Bachelor of Science Honours

Tannis Carle

Master of Science

Maryam Alyari

Stephen Awuku

Doctor of Philosophy

Dalia Ahmed

Karnjit Parmar

Chase Radford

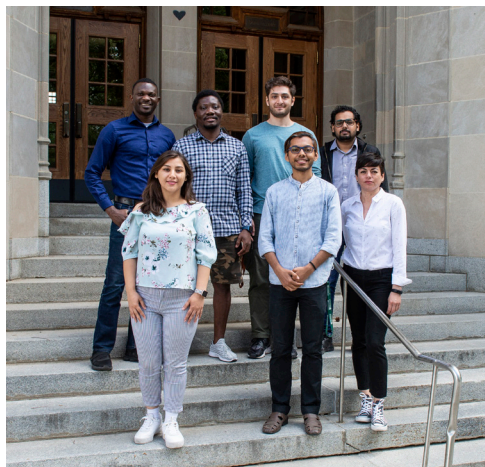
Josseline Ramos Figueroa

Mehran Rezazadeh Khalkhali

Kazeem Sulaiman

Natasha Vetter

Chemistry Course Council (CCC)



CCC Executive 2021-22 Back row (l to r): **Iyanu Kumayon** (Grad Students' Association Rep); **Alfred Yeboah** (Safety Committee Rep); **Ahmad Salehi** (Department Meeting Rep); **Jay Dave** (Member at Large). Front row (l to r): **Ozra Mohammadi** (Women in Chemistry Rep); **Srikant Singh** (President); **Deysi Venegas Garcia** (Public Relations Officer). Missing: **Stephen Awuku**, **Bernd Steiger**, **Cory Zaparaniuk**

As we move into the warmer days of the year, it is time to thank all who have supported us in reaching this new phase of vigor and optimism. After almost two years of complete standstill brought to us by the unprecedented global pandemic, things have finally started shifting back on track. The dormancy in 2020 and early 2021 reminded us how important being together is as part of the best experience in one's grad school journey. It was daunting as a council to keep up with the pre-pandemic traditions after the halt that left us grounded indefinitely. The council accepted the challenge and came up with its first in-person event after a long pause to welcome the new graduate students early this year. We were excited to get things up and running but were also cautious enough about the protocols in place for everyone's health and safety. The event was well-received and helped us gauge interests for future events. Since then, we have organized a few other successful events catering to both the academic and recreational wishes of the graduate students. At this point, it would be unfair not to thank the members of Women-in-Chemistry (USask-WiC) who supported us along the way and deserve equal credits for making all of this possible.

In this journey of transitioning back to normalcy, we look forward to rebuilding the connections through several other events. We extend our best wishes for 2022 with the hope that the future unfolds as new opportunities in a post-pandemic world. With heartfelt gratitude, we expect continued inspiration and enthusiasm down the road in exchange of our never-ending conviction to bolster graduate students' initiatives and welfare while adapting to the new normal.

Hope to see you at our next event! As always, warmest regards from CCC!



Women in Chemistry

The USask chapter of Women in Chemistry remains active and focused on bringing together a community of women and other underrepresented groups in science. We have made efforts to stay engaged as a group and remain connected even through the ever-changing times we are living in.

This past year, our events focused on building community bonds in our department. We hosted a Holiday Hangout celebrating together the many end-of-year holidays present throughout cultures, by giving out treats and coming together to enjoy some quiet time. In February, WiC along with the Chemistry Course Council (CCC) hosted a happy hour event for the graduate students of the department, gathering to stay connected through the colder months. WiC also collaborated with the CCC in an event in which we invited Professor **Tim Kelly** to talk about slide design and how to portray research accurately and to its best potential (top right). Our most recent event was a photoshoot for graduate students to have professional photos taken for free, for updating resumes and professional media with high-quality photos.

Our group has been undergoing a change in members and executives, and we are always open to new members. You can contact us at womeninchensask@gmail.com.



Chemistry Students' Society (CS2)

The Chemistry Students' Society was excited to be back on campus this year. Our goal for the new year was to repair what the pandemic had thrown at us.

First on the list, since we were back in person, was a move upstairs to a new lounge in Thorvaldson 264. Second, we pulled together an all-new executive team as most of the team from 2020/21 had graduated. Third, we planned many in-person events for students to get to know each other, such as game nights and year-end bowling. We also held a research night where we invited some professors from the department to present the work being done in their labs, as well as talk about summer research opportunities! Every month we hosted study nights to bring students together and help each other understand their material better. We also hosted midterm tutorial sessions for CHEM 112 and 115.



New CS2 lounge in Thorvaldson 264

With many of last year's executive team returning for the upcoming year, we hope to bring the Chemistry Students' Society to new heights with lots of exciting events and a much more active social presence on campus!

The CS2 Executive in 2021-22 was comprised of:

Abby Unrau (President)

Jane Polley (VP Financial)

Zoey Johnston (VP External)

Bdhanya Ramaswami (VP Academic)

Bryden Hartel (2nd Year Rep)

Jonathan Nakhleh (3rd Year Rep)

Equity, Diversity, and Inclusion



Women in Chemistry Multicultural Potluck

The 2021-2022 academic year saw the creation of a departmental standing committee on equity, diversity, and inclusion (EDI). Information about the department's commitment to EDI, as well as EDI-related resources are now available on the department's website.

The goal of the committee is to weave EDI considerations into all actions and decisions of the department. As a major first step, the committee developed a set of guidelines for EDI-centred best practices in faculty searches that the department will adhere to the future.



Wilson and Florence Quail Fund in Chemistry



Wilson Quail was a faculty member in the Department of Chemistry for 39 years before retiring in 2003. He enjoyed this long career as an inorganic chemist and crystallographer, studying everything from metal fluorides to proteins. He

continued to work as an emeritus professor in the Saskatchewan Structural Sciences Centre for over a decade, collaborating with researchers in the department. He and his wife Florence sent all their children to USask, cementing a strong relationship between the University and the Quail family. In 2017, Wilson and Florence agreed to a generous gift to the department, with the goal of helping new faculty with their research. In 2022, the funding committee awarded \$15,000 to **Eric Price** for equipment, a software license, and summer student support; and \$25,000 to **Amy Stevens** for graduate and undergraduate student support. 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.

Research Spotlight: Gas Stoves

The environmental and health effects of gas stoves have recently gained extensive media attention in recent months, following a report that gas stoves could contribute to climate change by leaking methane, even when they are not in use. Increased scrutiny of gas stoves has raised questions about the effects of gas stoves on indoor air quality. Studies led by **Tara Kahan** (pictured below) have reported high levels of nitrogen oxides (nitric oxide, nitrogen dioxide, and nitrous acid) in indoor air during and following the use of gas stoves. Long-term exposure to these pollutants can exacerbate or even cause respiratory issues such as asthma. Dr. Kahan has been interviewed regarding her research on this topic for radio and television (including 13 CBC radio shows across the country, CBC's *The National*, and Sirius XM radio), and has been cited in articles from publications including CBC News, Scary Mommy, and Today's Parent.



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

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

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