

The University of Iowa

# DEPARTMENT OF CHEMISTRY

2019-2020 NEWSLETTER





## MESSAGE FROM THE CHAIR

As the incoming Department Chair, I am writing to update you on some of the newest and latest happenings in University of Iowa (UI) Chemistry. At this moment, we are in the midst of dealing with a global outbreak of COVID-19. Our immediate focus is our students, and we are also thinking of you and appreciate all of your support. You can be assured that the Department and the UI are taking quick and responsible action during this unprecedented situation.

I am, indeed, honored and excited to take on the role of chair and hope that I can live up to the precedents set by our former chairs and immediate past chair Jim Gloer. I would like to thank Jim for his dedication, hard work, and service for the past (almost) four years in the front office. Jim's leadership will be greatly missed, although I know the Department will benefit from his mentorship in the years to come.

Let me briefly introduce myself. I grew up in Halifax, Nova Scotia, Canada and discovered my passion for chemistry while an undergraduate at Saint Mary's University in Halifax. I earned my Ph.D. from the University of Missouri-Columbia, completed a Research Associate Position at the National Research Council of Canada in Ottawa, and then joined the UI faculty in 2000 as an Assistant Professor. I was promoted to Associate Professor in 2005 and Full Professor in 2010. My research program is focused on organic solid-state chemistry and applications of organic and metal-organic solids to areas such as organic synthesis, energy storage, electronics, and pharmaceuticals. I look forward to working with all members of the Department to help lead Chemistry. As I travel nationally and internationally to attend chemistry conferences and functions, I am always excited to meet our past undergraduate and graduate students. Everyone is always eager to catch up and discuss the latest happenings in the Department in Iowa City.

The Department and our faculty continue to undergo growth and achievement. Scott Shaw was recently promoted to Associate Professor, while Amanda Haes and Chris Cheatum were both promoted to Full Professor. Scott and Amanda were recognized as a College of Liberal Arts (CLAS) Scholar and Collegiate Scholar, respectively. Chris has been appointed as the Director of the Iowa Center for Research, Exploration, and Advanced Technology in Engineering and Sciences (or 'Iowa CREATES'). The facility also houses the new Materials Analysis, Testing, and Fabrication (MATFab) facility. Iowa CREATES and MatFab bring together under one roof the most modern, sophisticated equipment that faculty and staff need to conduct cutting-edge materials research. These accomplishments speak

volumes to the leadership roles that our chemistry faculty provide within and outside the University of Iowa. I was also personally honored to be named a Collegiate Fellow by CLAS, as well as receiving a Graduate College Outstanding Mentorship Award.

We are also excited to have two new faculty members join the Department during the past year. Florence Williams joined us after four years as an Assistant Professor at the University of Alberta, Canada. David Martin joined us after five years as an Assistant Professor at the University of California, Riverside. Florence's research focuses on boron-mediated transformations, green coupling reactions, and development of small molecules that affect the nervous system. David's research focuses on new catalytic transformations, strategies for



**Len MacGillivray**

*Department Chair (DEO), Department of Chemistry  
Collegiate Fellow, College of Liberal Arts and Sciences*

bond activation, and the synthesis of bioactive molecules for treatment of human disease. We are thrilled to have both Florence and David on the faculty and look forward to their future contributions.

In addition to individual federal and private research grants and contracts, our faculty has recently garnered two highly prestigious National Science Foundation (NSF) grants to augment our state-of-the-art research instrumentation. We were awarded separate grants by the NSF to acquire a single-crystal X-ray diffractometer and a hybrid quadrupole mass spectrometer. The instruments will come online during the academic year and will be extremely important in supporting our efforts to

push forward our research efforts, as well as attract new faculty.

I would like to personally take this opportunity – and especially at this moment – to thank all of those who have supported and continue to provide support for our Department through chemistry-directed contributions to the UI Center for Advancement. I cannot overstate the appreciation we have for the financial support that our alumni and other friends have and continue to provide. If you are thinking about contributing to the Department then, now is the time, it will make a big difference. Funds provided either directly to the Department or as income from endowments enable us to reward our undergraduate students through scholarships that recognize strong performance and help with ever-rising college expenses. Funds can also enable us to support our graduate students, including awards for research and teaching excellence, summer fellowships, travel costs to attend scientific conferences, funding for safety initiatives, community outreach efforts, and other activities that foster career development and growth as scientists. With approximately 125 graduate students in the program, there are many such needs! We are constantly developing Departmental events that promote networking and camaraderie among our students. We now have an active Graduate Student Advisory Group that is heading many new student-led initiatives. Of course, support for faculty and their efforts is also critical and greatly appreciated. Many types of ancillary, but important expenses are not covered by research grants or UI budgets, and having funds available that permit us to meet some of these needs helps a great deal. All of these sources of support are essential to the vitality of our Department.

Please keep track of developments in the Department by visiting our web site at [chem.uiowa.edu](http://chem.uiowa.edu) and following us on social media (e.g., Facebook and Twitter). I also invite you to stop by for a visit. The interactive periodic table in the main entrance to CB (only two nationwide!) is a campus highlight, and the renovation of our building and new construction across the UI campus is exciting to see. The UI "Brain Rock" sculpture also sits on the T. Anne Cleary Walkway right next to CB.

I look to the future of our Chemistry Department as a place for innovation, collaboration, and a destination for teaching, research, and service. Please let us know if you would like to stop by in the future, and we would be happy to give you a tour of our facilities and update you on the latest Departmental progress. Please continue to take care of your well-being and we look forward to connecting to you soon.

# Chemistry Without Borders: Insights from the 1st American-Mexican Symposium on Supramolecular Materials Design

by Gonzalo Campillo-Alvarado,  
PhD program in Chemistry  
twitter: @wimblegon

The Department of Chemistry of The University of Iowa (UI) hosted the 1st American-Mexican Symposium on Supramolecular Materials Design (AMEX-SSMD), in the Iowa Advanced Technologies Building (IATL) on November 8th, 2019. The symposium represented the beginning of an international series of meetings on the rapidly growing field of supramolecular chemistry or “chemistry beyond the molecule”, and its applications.

The symposium provided a platform for more than 50 participants from eight institutions (four international, UI, Cornell College, Grinnell College, and Kirkwood Community College), including faculty, students and industrial scientists, to discuss opportunities between the US and Mexico where the use of supramolecular chemistry can be a potential solution for mutual problems and challenges.

The symposium hosted four keynote speakers: Prof. Karen Ochoa-Lara (University of Sonora), Prof. Braulio Rodríguez-Molina (National Autonomous University of Mexico), Prof. Tori Z. Forbes (UI) and Prof. Hugo Morales-Rojas (Autonomous University of the State of Morelos), who gave inspiring talks highlighting applications of supramolecular chemistry to solve current social challenges, including the development of DNA-based receptors, molecular machines, materials for storage and purification of water, and pharmaceutical solids.

“ I liked the inclusive environment of the symposium. The talks were diverse and fluid. Presenting my research to an international and interdisciplinary audience allowed me to get helpful input for my research.”

*-Celymar Ortiz - PhD student in Chemistry, UI*

In line with the scope of the symposium, UI Chemistry graduate students led the discussions, as well as question and answer periods, for the four keynote and ten student oral presentations. The discussions emphasized interdisciplinarity and collaboration. An important component of discussion was the participation of members of chemical and pharmaceutical industries, who encouraged collaboration with academia in order to work together toward common goals.



The event also included a poster session in an inclusive social setting that facilitated networking and collaboration with different members of the UI.

The ACS Iowa Local Section annual dinner, presided by Prof. Betsy Stone (UI), served to close for the symposium. Prof. Hugo Morales-Rojas gave a talk on his interactions with the pharmaceutical industry, and shared perspectives and examples of successful international collaborations (e.g., research internships, funding opportunities for American and Mexican students, international meetings).

A Special Virtual Issue in the peer-reviewed American Chemical Society journal *Crystal Growth and Design* is planned for 2019-2020 (Guest Editors: Prof. Len MacGillivray (UI) and Prof. Hugo Morales-Rojas). The issue will highlight research on recent developments and applications the field of supramolecular chemistry with

“ The intimacy and kindness that all of the students and faculty showed me, made this my favorite conference that I have attended in my five years of graduate school, even though it was easily one of the smallest. This was an awesome opportunity to establish professional connections with several of the students and faculty and I hope that this conference will carry on so that others may have as great of an experience and opportunity as I did.”

*-Taylor V. Fetrow, PhD student in Chemistry, UI*

emphasis of products of international collaborative work. Additional outcomes of the meeting include the future establishment of an international ACS Chapter in Mexico, as well as the organization of symposiums and forums.

The 1st American-Mexican Symposium on Supramolecular Materials Design was sponsored by the American Chemical Society (ACS) Global Innovation Grant and the ACS Iowa Local Section. The event was part of the International Year of the Periodic Table (IYPT). The symposium co-chairs were Prof. Leonard. R. MacGillivray, Prof. Betsy Stone and Gonzalo Campillo-Alvarado.

## PROMOTIONS

### Dr. Haes Promoted to Professor



**Amanda J. Haes** has been promoted to the rank of Professor. She joined the faculty in the Chemistry Department at the University of Iowa in 2006, after earning a Ph.D. in Chemistry from Northwestern University and serving as an NRC Research Associate at the U.S. Naval Research Laboratory. Her research group combines both experimental and

computational methods to predict and exploit the size dependent properties of metal and metal oxide nanomaterials in both fundamental and applied studies in the areas of Raman spectroscopy, plasmonics, and surface-enhanced Raman scattering. Professor Haes focuses on a number of key issues related to nanoscience and nanotechnology including quality control of nanomaterials and surface chemistry, impacts of intermolecular interactions and surface selection rules on vibrational features of molecules, as well as quantitative sensor development for applications in biology, chemistry, dentistry, and environmental science. These studies are and/or have

been funded by the National Science Foundation, National Institutes of Health, Office of Naval Research, and Roy J. Carver Charitable Trust. Recently, Professor Haes was selected as a “Must See” presenter at a National American Chemical Society Conference and serves as a standing member of the National Institutes of Health Instrumentation and Systems Development Study Section. In addition to her research, Professor Haes serves as Principal Investigator and Co-Director of a National Science Foundation funded Research Experience for Undergraduates summer program in the area of nanoscience and nanotechnology. She and her group have also hosted over 1,000 elementary and middle school students, teachers, and parents from local communities to the University of Iowa campus for various STEM activities.

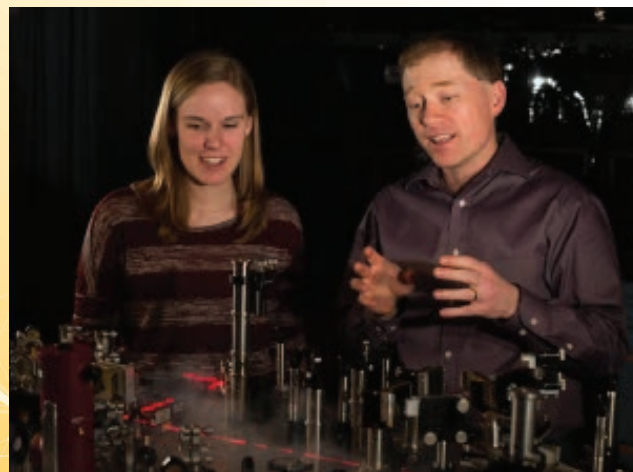


### Dr. Cheatum Promoted to Professor



**Christopher M. Cheatum** has been promoted to the rank of Professor. Prior to joining the faculty at Iowa in 2003, Prof. Cheatum received a Bachelor of Science degree in Chemistry from the University of New Mexico. He later earned a Ph.D. from the University of Wisconsin-Madison under the guidance of Professor F. Fleming Crim where he focused on studying vibrational relaxation and chemical reaction dynamics in solution. After his Ph.D. he carried out postdoctoral work at M.I.T. with Professor Andrei Tokmakoff. This work focused on developing two-dimensional infrared (2D IR) spectroscopy and its application to the study of protein structure and dynamics. His current research at Iowa focuses on using 2D IR to probe enzyme dynamics and the role of enzyme motions in catalysis. His work as applications ranging from protein engineering to drug discovery and has been funded by the National Science Foundation and the National Institutes of Health. In addition to his research, Professor

Cheatum is also an active participant in Skype-A-Scientist, which is a program that matches scientists with classrooms around the world so that students everywhere can have a chance to have a live video chat with a scientist and learn about what they do. He is also the director of the Materials Analysis, Testing, and Fabrication (MATFab) Facility and the Iowa Center for Research, Exploration, and Advanced Technology in Engineering and Sciences (Iowa CREATES), which are funded by the Office of the Vice President for Research to support physical sciences and engineering researchers from all across the University of Iowa campus.



## Dr. Shaw Promoted to Associate Professor

**Scott K. Shaw** has been promoted to Associate Professor with tenure. Professor Shaw joined the Chemistry faculty at the University of Iowa in the fall of 2012. Scott is a Midwest native; he was born in rural Illinois and received his bachelor's degree in chemistry with secondary education certificate from Monmouth College. In 2003, he started doctoral training in Chemistry under Andy Gewirth at the University of Illinois at Urbana Champaign. Starting in 2008, he held postdoctoral positions with David Schiffrin (Liverpool, UK) and Colin Bain (Durham, UK), and was awarded a National Science Foundation post-doctoral fellowship in 2010, which he spent at the University of Arizona with the group of Jeanne Pemberton.



tures and functions of chemical interfaces and thin films using spectroscopy, (probe) microscopy, electrochemistry, and many other analytical techniques. Current projects include measuring the structure and properties of fluid-solid interfaces, developing chemical systems for CO<sub>2</sub> recycling, and linking the architectures of environmental interfaces to the fate and transport of persistent organic pollutants. These projects are currently supported by the National Science Foundation, American Chemical Society, Research Corporation for Scientific Advancement, and the Department of Defense. Prof. Shaw also leads the Rural Scholars program at Iowa, which introduces first-year students to STEM research each year by guiding them in genuine laboratory investigations of their own design.

Prof. Shaw teaches analytical chemistry courses and leads a group of ten graduate students and four undergraduate students. Together they investigate the struc-



Dr. Scott K. Shaw Group

# STUDENT AWARDS & RECOGNITION

## Graduate Student Awards & Recognition

### External Recognition

- NSF Internship –  
Jaclyn Curry
- ACS Analytical Chemistry Graduate Summer Fellowship –  
Hansol Lee
- 2019-2020 Diversity Fellowship at Augustana College –  
Rayford Harrison

### University Recognition

- Ballard and Seashore Fellowship –  
Benjamin Foust, Kyoungsoon Lee, Shalisa Oburn,  
Chethya Ranasinghe (*Spring 2019*); Nathan Black, Jason Mixdorf,  
Hoa Phan, Shweta Yelgaonkar (*Fall 2019*)
- Graduate College Post-Comprehensive Research Award –  
Taylor Fetrow, Daniel Parr, Mohammad Shohel,  
Mahboubeh Varmazyad (*Spring 2019*)
- Graduate College Summer Fellowship –  
Weththasinghage Don Amith, Jay Bell, Eric Brown,  
Stephen Cullen, Saumya De Silva, Alisa Fairweather,  
Grant Forsythe, James Grace, Jacob Hackbarth, Andrew Horvath,  
Dagen Hughes, Robiul Islam, Thi-ranjeewa Lansakara, Jiayue Li,  
Majid Nada, Daniel Parr, Chloe Schroeder, Grant Shivers,  
Kyle Spielvogel, Mahboubeh Varmazyad
- Council on Teaching Outstanding Teaching Award –  
Alisa Fairweather, Tina Mihm,  
Daniel Parr

### Department Awards

- Graduate Student Voted Awards –
  - Best Analytical Seminar:  
Hansol Lee
  - Best Inorganic and Chemical Education Seminar:  
Maurice Payne
  - Best Organic Seminar:  
Shalisa Oburn
  - Best Physical and Environmental Seminar:  
Chethya Ranasinghe, Kamal Ray
  - Best 2nd Year Analytical Seminar:  
Jessica DeYoung
  - Best 2nd Year Inorganic and Chemical Education Seminar:  
Lindsey Applegate, Mikaela Pynch, Johnathan Culpepper
  - Best 2nd Year Organic Seminar:  
Katherine Sulaitis
  - Best 2nd Year Physical and Environmental Seminar:  
Chathuri Kaluarachchi
  - Teaching Assistant Rookie of Year:  
Mathew Emerson
  - Teaching Assistant Appreciation Award:  
Jay Bell
  - Best Outreach:  
Elias Hasenecz
  - Most First Author Publications in the Last Year:  
Gonzalo Campillo-Alvarado
  - Safest Research Group:  
Dr. Stone's Research Group
- Departmental Teaching Award –  
Chengxuan Guo
- A. Lynn Anderson Award for Research Excellence –  
Shalisa Oburn, Kyoungsoon Lee

### 2018 – 2019 M.S. Graduates

Ashley Flores (*Fall 2018*); Sidney DeBie, Lillie Durow,  
Ryan Golkowski, William Marquardt, Aman Panwar,  
Michaela Raglione, John Terrel (*Spring 2019*)

### 2018 - 2019 Ph.D. Graduates

Alaa Al Minshid, Courtney Donahue, Chad Gilmer, Sherif Ibrahim,  
Sanjaya Jayalath Mudiyansele, Kalani Karunaratne, Deokhyeon  
Kwon, Dibyendu Mondal, Anthony Montoya (*Summer 2018*);  
Radhika Anareddy, Anastasia Blake, Justin Carter, Ananda Ghosh,  
Ilya Gurevic, Parin Shah, Eric Sletten (*Fall 2018*); Nicole Dischler,  
Benjamin Foust, Moustafa Gabr, Jacob Grant, Kyoungsoon Lee,  
Maurice Payne, Wenjing Xi (*Spring 2019*)

# STUDENT AWARDS & RECOGNITION

## Undergraduate Awards & Recognition

- Donald J. Burton & Margaret A. Burton Scholarship – Alissia Milani
- E. David Cater Scholarship – Lindsey Reicks
- Russell K. Simms Scholarship – Hannah Lembke
- Kenneth Sando Undergraduate Scholarship – Rebecca Walters

### Chemistry Alumni Awards

Sr. Recipient – Francesca Eckstrom | Jr. Recipient – Tianyi Li | Soph. Recipient – Hannah Sunderman

- CRC Freshman Chemistry Award – Anthony Shirazi
- Merck Index Award – Virginia Lamas Meza
- American Institute of Chemists Award – Jesse Cochran
- ACS Division of Analytical Chemistry Award – Emily Carroll
- ACS Division of Inorganic Chemistry Award – Allison Peroutka
- ACS Division of Organic Chemistry Award – Rebecca Walters
- ACS Division of Physical Chemistry Award – Emily Amato
- Viksnins, Harris, & Padys Poster Award – Megan D'mello & Avery Stricker
- Team Award – *To be announced*

### B.S. and B.A. Graduates

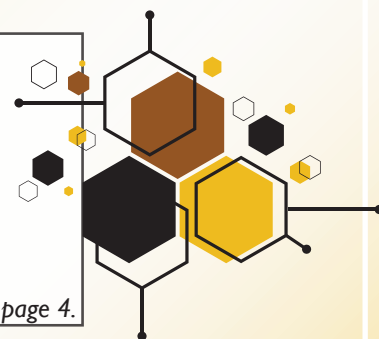
Fall 2018: Katelyn Harms, Yuting Hu, Caleb Kahley, Gregory Sheyka (BS); Michael Prokos (BA) Spring 2019: Jesse Cochran, Bryce Dawson, Erica Fagerbakke, Seth Hoogendoorn, Hannah Lembke, Adrian Les, Robert Specht, Sidney Spurgeon, Derek Wagner, Jay Williams (BS) Omar Abdalla, Lance Breon, Noah Coatney, Erica Cole, Kayla Comried, Marco Cuellar, Pearce Fowler, Anna Harisiadis, Ellyse Henkle, Amani Kibasa, Daniel Kusper, Mo Li, Michael Lord, Lucas Maakestad, Cyrus Mansouri, Taylor McCall, Adam Miller, Vin-cent Parra, Eduard Popa, Ryan Rankin, Nicholas Steffen, Yin-Ko (Ian) Sung, Tian Wang, Logan Young, Junan Zhang, Yi Zheng (BA)



## Professor Haes Named Collegiate Scholar

The College of Liberal Arts and Sciences at the University of Iowa has named Professor Amanda Haes as a Collegiate Scholar, which recognizes faculty for excellence as evidenced in their promotion record at the time of their candidacy for promotion to the rank of full professor.

*Read full bio on page 4.*



## Shaw Named Dean's Scholar

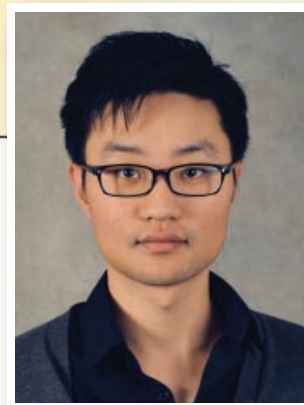
The College of Liberal Arts and Sciences has named Professor Scott Shaw as a Dean's Scholar. Dean's Scholar awards recognize faculty for excellence as evidenced in their promotion record at the time of their candidacy for tenure.

*Read full bio on page 5.*



## Hansol Lee selected for 2019 ACS Analytical Chemistry Graduate Summer Fellowship

**C**ongratulations to Hansol Lee, of the Tivanski Group, who was selected to receive a 2019 ACS Analytical Chemistry Graduate Summer Fellowship. The American Chemical Society Division of Analytical Chemistry Graduate Fellowship Program is designed to encourage basic research in the field of analytical chemistry, to promote the growth of analytical chemistry in academic institutions and industry, and to provide recognition of future leaders in the field of analytical chemistry. The program has endeavored to be a model of the benefits of cooperation between the academic and industrial communities, with chemical companies employing Ph.D. analytical chemists sponsoring the fellowships for outstanding analytical graduate students.



## Professor MacGillivray named Collegiate Fellow



**A**rts and Sciences has named Professor Len MacGillivray a Collegiate Fellow, the College's highest faculty honor, in recognition of his distinguished teaching, research, and service.

Len MacGillivray, who joined the UI faculty in 2000, is professor of Chemistry and holds a secondary appointment in the College of Pharmacy. He is a first-generation college student who earned his PhD from the University of Missouri-Columbia. His current research involves designing organic solid-state materials for applications in organic synthesis, materials science, and pharmaceuticals. MacGillivray's work has been supported by the National Science Foundation and industry. He is a Fellow of the Royal Society of Chemistry, the American Association for the Advancement of Science, and the American Chemical Society (ACS), and serves as the local coordinator of the ACS's U.S. National Chemistry Olympiad. He has published more than 200 manuscripts; conducted peer reviews of hundreds of journal manuscripts, grants, and contracts; holds six U.S. patents; and is a co-editor of the International Union of Crystallography Journal. He also has been awarded the 2019 Outstanding Faculty Mentor Award from the UI Graduate College.

## Professor MacGillivray named Outstanding Faculty Mentor

**P**rofessor Len MacGillivray has been selected as the recipient of the 2018-2019 Graduate College Outstanding Faculty Mentor Award: Mathematical, Physical Sciences, and Engineering. He was presented the award during the joint Graduate Faculty/Directors of Graduate Studies meeting on Wednesday, May 1, 2019 in the Old Capitol Senate Chamber.





## Jaclyn Curry awarded NSF Internship

Jaclyn Curry, of the Shaw Group, has been awarded a federally funded research internship under the NSF-INTERN program. The funds supported her for six months in an industrial lab, working on a project that enhanced her UI dissertation. Jaclyn worked with the company Mari Signum. Biopolymers such as chitin aim to substitute the need for synthetic plastics, creating less expensive and more environmentally friendly products. Mari Signum produces sustainable, high-quality chitin and chitin-based products. Their ionic liquid technology was the link between Jaclyn's thesis work and their industrial process, and Jaclyn contributed by helping them develop industrial processes in lucrative markets such as plastics, agriculture, cosmetics, and medical.

Jaclyn was also involved in establishing new technology platforms/solutions and supporting the technical strategies of the company. She worked on design of experiments to accomplish technical goals and receive relevant expertise in materials chemistry, polymer interactions, and analytical methods, as well as gained understanding the influence of processing on final product properties. Jaclyn was also exposed to business practices, whenever possible (i.e., use scientific concepts in marketing), which would not be traditionally offered in an academic setting. She worked in Mari Signum's new R&D laboratory in Richmond VA.



## Professor Scott Daly receives Distinguished Veteran's Award

Scott R. Daly was born in Joliet, Illinois, and grew up in a small community north of Ocala, Florida. After graduating from high school in 1998, Daly enlisted in the U.S. Army as an M1 Abrams armor crewman. During his military career, Daly received multiple awards.



After being honorably discharged in August 2001, Daly earned his bachelor of science degree in chemistry from North Central College in Naperville, Illinois. In 2010, Daly received his PhD in chemistry from the University of Illinois at Urbana-Champaign. After holding positions in New Mexico and Washington, D.C., Daly joined the UI.

Daly is an assistant professor of chemistry and runs a research group of eight graduate students and five undergraduate researchers. His research is funded by the National Science Foundation, American Chemical Society, and the Department of Energy.

## Dale Swenson receives Mary Louise Kelley Staff Excellence Award



After earning a PhD in Physical Chemistry from the Chemistry Department of the University of Iowa (focusing on crystal structure analysis using x-ray diffraction of single crystals) I spent 1979 - 1990 in Buffalo, NY as a postdoctoral student at the Medical Foundation of Buffalo (MFB), an assistant professor in Chemistry at D'Youville College and back to MFB as an assistant research scientist. During my tenure at D'Youville I taught general, analytical, inorganic and physical chemistry and introductory physics. At MFB I managed the single crystal diffractometers (SCD) for the Molecular Biophysics Department, learned the direct method technique for solving crystal structures from the Nobel Prize winning Herbert Hauptman (one of the originators of the technique) and helped develop a novel two-wavelength SCD prototype. In 1990 I accepted an offer to manage the X-Ray Diffraction Facility in the Chemistry Department at Iowa and am still in that position. The capabilities have expanded greatly since 1990 with advances in x-ray detector technology, computation capability and x-ray tube capability. In the 1990's we typically analyzed 30-50 samples per year using two serial SCDs. In the 2000's we added a new area detector SCD that allowed analysis of 200+ samples per year. In the 2010's we acquired two used area detector systems to increase our production to 300+ samples per year and in 2019 added a new dual wavelength system to replace two of the old obsolete systems. The new system can do in one hour what would take one of the original systems 3 days to do. During my tenure we have also added x-ray powder diffraction capability. The first powder diffractometer was installed in 1995 and was replaced with a new system in 2011.

# WELCOME NEW FACULTY MEMBERS



**Dave Martin**

Dave Martin was born and raised in Calgary, Alberta, Canada and spent a lot of time growing up hiking, camping and snowboarding in the Canadian Rockies west of Calgary. He received his Bachelor of Science degree in Chemistry from the University of British Columbia and worked as a medicinal chemist at the Merck-Frosst Centre for Therapeutic Research. In 2006, Dave started graduate school at the University of California, Irvine where he worked with Prof. Chris Vanderwal on the application of Zincke aldehydes toward the synthesis of Strychnos alkaloids, including a short synthesis of strychnine.

After obtaining his Ph.D. in 2011, he moved to Princeton, NJ to pursue post-doctoral research in the lab of Prof. Dave MacMillan developing new applications of photoredox catalysis. Dave began his independent career at UC Riverside in 2014 and moved to the University of Iowa in 2019.

Research in the Martin group is focused on the development of new catalytic transformations and the synthesis of bioactive molecules for the study and treatment of human disease. Nature provides inspiration in the form of known biochemical processes, such as the role of vitamin B12 in our metabolism (to generate reactive radicals) and naturally occurring molecules that protect neurons from toxins and dysregulated signaling. Dave's research lab uses vitamin B12-inspired cobalt complexes to discover new ways to generate reactive organic radicals in an efficient and sustainable manner. They have also completed syntheses of members of the limonoid family, isolated from citrus and Chinese traditional medicines, and are studying their potential in understanding and ultimately treating neurodegenerative diseases. Dave is guided by the consideration of larger problems where organic chemistry is poised to offer practical solutions, often in collaboration with other researchers at the University of Iowa in an interdisciplinary fashion.



**Florence Williams**

Florence grew up in Pasadena, CA, USA. She began her academic research in the inorganic lab of Prof. Marc Walters while an undergraduate student at New York University. Her work involved the synthesis of new MRI contrast agents based on a silver nanoparticle scaffold decorated with organic ligands to bind gadolinium ions. She also participated in the UT San Antonio B-SURE summer program, where she was exposed to cell culture research involving fluorescent detection of potassium ion channel protein aggregates.

After obtaining a B. S. in chemistry honors with a math minor, Florence pursued her Ph. D. under the guidance of Prof. Elizabeth Jarvo at University of California, Irvine. Her thesis work centered on organometallic catalysis (palladium, rhodium, and nickel-based) for synthetic methodology development. Following the completion of her Ph. D., Florence worked for Prof. Dorothea Fiedler at Princeton University in the area of chemical biology. She developed new reagents for the detection of phosphate-related functionality in biological media. Specifically, Florence developed a ratiometric fluorescent probe for the detection and quantification of diphosphate esters on proteins and peptides.

After post-doctoral research, Florence began her independent career at University of Alberta in Edmonton, AB, Canada. Her research areas (then and now) bridge traditional synthetic methodology development and chemical biology. In particular, early papers outline the use of boron Lewis acids for the chemospecific cleavage of strong ether bonds, including in complex lignocellulose biopolymer. Florence enjoys spending time with her puppy Fiona, hiking, beer brewing, and the occasional video game.



**Adam Brummett**

Adam Brummett received his B.S. in chemistry and minor in physics from the University of Missouri-Kansas City. While at UMKC, he participated in research synthesizing polycyclic aromatic hydrocarbons. In 2009, he joined the chemistry Ph.D. program at the University of Iowa. While earning his Ph.D., Adam studied organic polymer synthesis and later conducted research on metal-dependent enzymes via biochemical studies and X-ray crystallography. He developed a mechanism through which a series of enzymes produce a climatically active gas.

Wanting to remain a Hawkeye, Adam stayed at the University of Iowa to teach chemistry as a visiting assistant professor and in the Fall of 2019 was hired as a Lecturer. In recent years, Adam has specialized in teaching large first-year chemistry courses and was recognized with the Lane Davis Award for Honors Team Teaching (2019). He has recently been involved in updating curriculum for the Principles and General Chemistry courses. Outside of the classroom, you can find Adam exploring Iowa's unique opportunities for adventure through mountain biking, hiking and rock climbing.