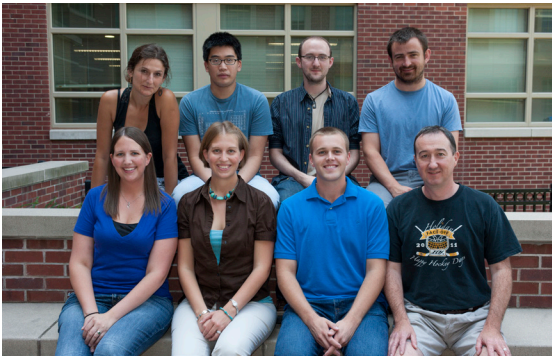


**THE**  
**UNIVERSITY**  
*of IOWA*  
**DEPARTMENT**  
*of CHEMISTRY*  
**2014-2015**  
**NEWSLETTER**







# MESSAGE FROM THE CHAIR

Winter has arrived early in Iowa City this year and the end of a busy fall semester is quickly approaching. I am writing to you as the new chair (or Departmental Executive Officer (DEO) as we are called at UI) of the Department of Chemistry, having been on the job for four months now! First, on behalf of the entire Department of Chemistry, I would like to thank Professor Mark Arnold for his four years of service as chair. Under Mark's leadership, 5 new tenure track faculty were hired, bringing the faculty numbers to a high mark of 30 tenure track faculty and 2 lecturers. The department also expanded with several new staff positions, increasing numbers of graduate TAs and undergraduate majors.

This fall, the department welcomed 28 new graduate students, joining a graduate population that now numbers over 130. The Department is also teaching a record number of undergraduates who are enrolled in our introductory chemistry courses and this number is expected to continue to grow as the University embarks to increase undergraduate enrollment in the coming years. Flood mitigation projects at the Iowa Advanced Technologies Laboratory (IATL) and the Iowa Memorial Union are ongoing and projected to be completed in spring 2015, just in time for the construction to start on the new dormitory to be built just north of the Chemistry Building.

We are pleased to welcome two new additions to our faculty, Dr. Nicole Becker (chemical education) and Dr. Scott Daly (inorganic chemistry) who both joined the department as assistant professors in Fall 2014. Their expertise brings new strengths and perspectives to the research and teaching missions of the department. Several new staff members have recently joined the department. Ellie Keuter, a recent BS graduate from our department, was hired as the Chemistry Center manager and Diane McGriff joined the staff in Chemistry Stores. Nicholas Francisco took over as financial analyst for John Hawkins who retired last summer and Jenny Nelson joined the department as the Administrative Services coordinator for the Nanoscience and Nanotechnology Institute.

Another highlight of the coming year is the roll-out of a new curriculum for the Bachelor of Arts

(BA) degree in Chemistry. The new BA is available to undergraduate students starting this fall and includes two new courses: a one-semester physical chemistry course (offered every fall semester) and an integrated advanced laboratory course (offered each spring semester). This new curriculum provides a rigorous but flexible plan of study for students who wish to combine an interest in chemistry with preparation for professional programs, such as medicine or dentistry, interdisciplinary graduate study in fields, such as environmental science, or advanced degrees in fields, such as law or business.

I would also like to offer congratulations and to recognize the recent accolades received by our faculty, staff and students that are detailed elsewhere in this newsletter. We are fortunate to have a talented and dedicated cohort of faculty, staff and students who continue to excel in research, education and outreach efforts.

As you can see from this brief note, our department continues to shine at the University level and in the broader scientific community. Department faculty, staff and students have spearheaded new outreach activities, such as the Climate Change Festival that debuted this past April. Numerous faculty have hosted local school group visits to our labs for tours and hands-on science experiments. Our department also hosts a weekly colloquium series, departmental seminars, and distinguished lectureships, which bring noted scholars from around the country to share their research with our students and faculty. Undergraduate and graduate student awards are presented annually at the Chemistry Appreciation night typically held in May. For a complete listing of these awards and for more departmental news and updates, I encourage you to continue reading this newsletter and to regularly visit our departmental website at <http://www.chem.uiowa.edu>.

The interactive periodic table just beyond the main entrance to the Chemistry Building welcomes students and visitors to the department, and the extensive, recently completed renovation of the building, continues to benefit the department's mission of excellence in chemical research and education. We warmly invite you to stop by and visit to see firsthand the many changes and advances in the Department of Chemistry in recent years.

*Sarah C. Larsen*



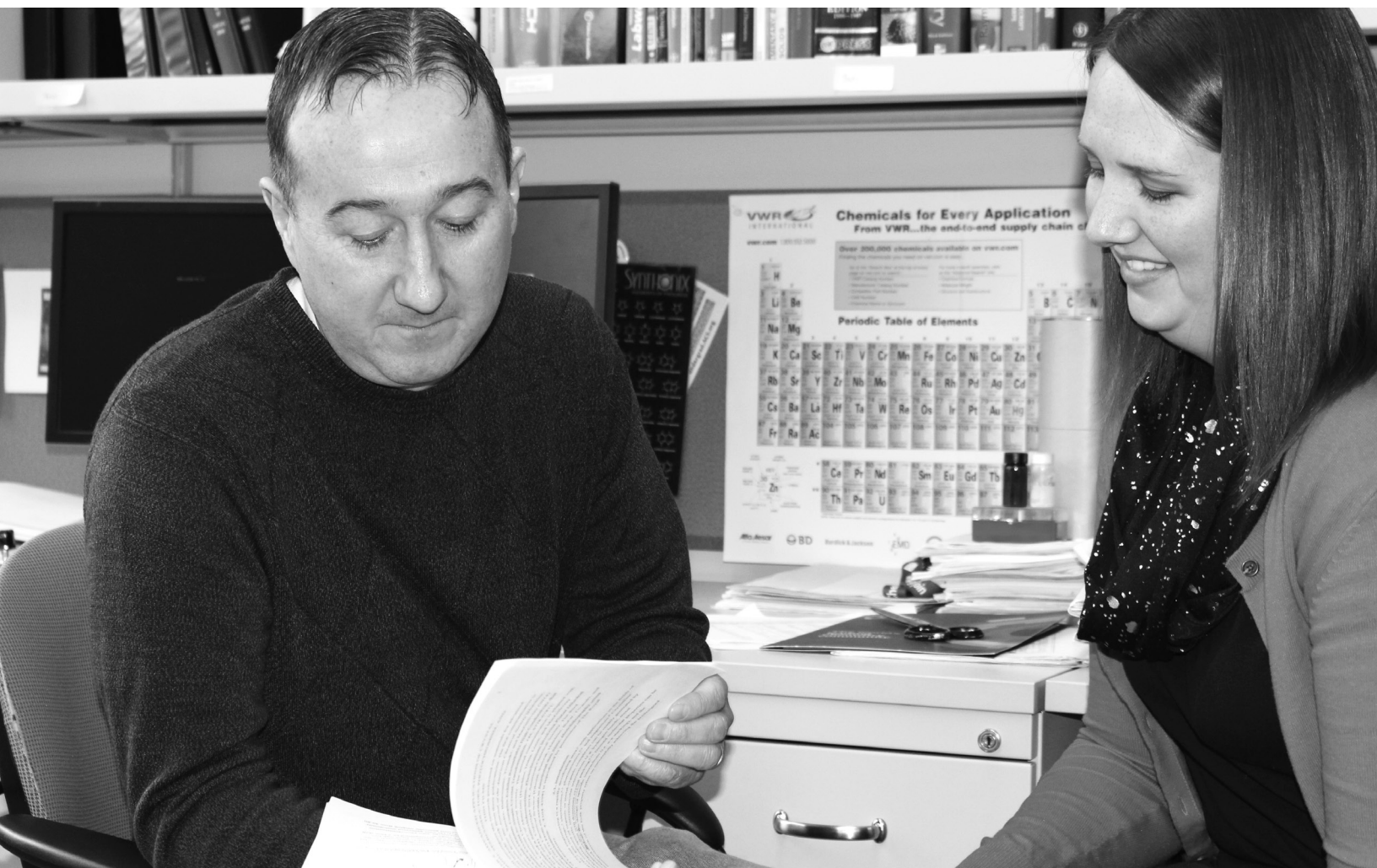
# BEYOND THE MOLECULE

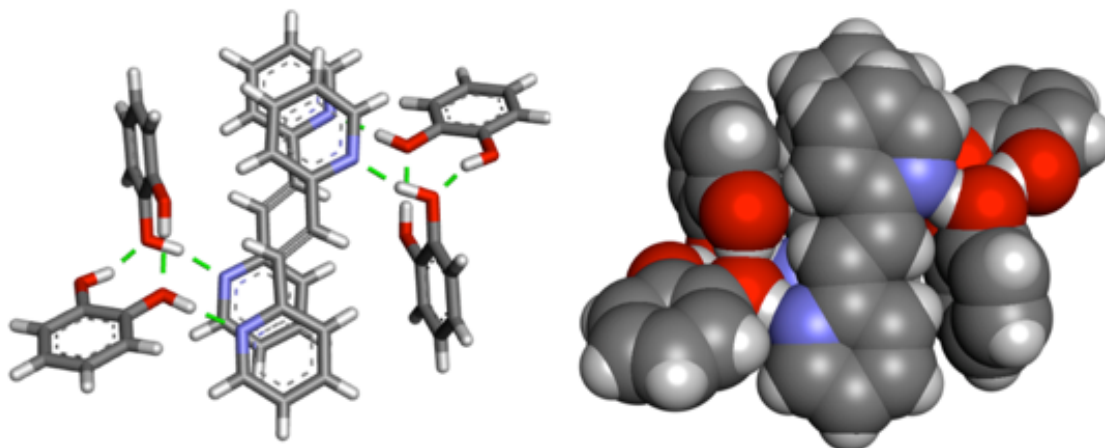
*A Profile of  
Len MacGillivray*

Supramolecular chemistry is chemistry beyond the molecule, and that's where Dr. Len MacGillivray's research is focused. The field of supramolecular chemistry relates to making use of intermolecular forces. These are non-covalent interactions between or within molecules. For example, DNA is a strand of bases and each base interacts with another through hydrogen bonds to form the double helix. The hydrogen bonds are an intermolecular force. The chemistry of life is sustained by intermolecular forces. "You can think of spider silk," says Dr. MacGillivray, "it's an extremely strong, light-weight material created by nature, using the same principles that get right down to the chemistry of DNA. As chemists, we can deliberately pick atoms from the periodic table, whereas nature has taken millions and millions of years to evolve. Once we learn the rules of biology, we should

be able to apply them in ways that meet and possibly go beyond what nature has accomplished."

Specifically, MacGillivray's supramolecular chemistry is performed in the solid state. "When you think about organic chemistry, what often comes to mind is a person performing a chemical reaction in a liquid in a flask. But we've known since the early 1900s that reactions can occur in crystals." And that's exactly what the MacGillivray group has been working to do. They are trying to open up the solid state as a viable medium for making molecules by carrying out reactions in crystals using principles of supramolecular chemistry. It gets tricky though, because there are very strict geometric requirements for a reaction to occur in the crystalline form: the reactive sites must be properly aligned and close to one another - on the order of angstroms (or 10<sup>-10</sup> meters). "To get two molecules within a few angstroms of one another in a very specific orientation is a challenge. The way I think about it is it's like sending the Mars Rover on a mission to pick up a small rock. Molecules must be designed to assemble in a crystal with upmost care and caution, or the experiment is over. We are on a different length scale." The MacGillivray group sends molecules into crystals using molecules known as templates - recall the templating ability of DNA - to assemble the reactive molecules





A catechol molecule (gray and red) directs a solid-state reaction of an alkene (gray and blue) using hydrogen bonds (dotted).

into very specific spatial orientations so that reactions can be possible. Basically, the template molecules hold the reactive molecules together, through intermolecular forces, so that they are aligned and about four angstroms apart, which allows the reaction to occur.

This solid-state chemistry has applications spanning multiple areas, and Dr. MacGillivray takes advantage of this by working with other scientists, both at UI and around the country. One such collaboration is with the pharmaceutical research company AbbVie, formerly Abbott labs, based in Chicago. MacGillivray studies drug molecules by crystallizing them with other molecules to form co-crystals. "A goal is to change the solubility of a drug for delivery since a drug plus something else is a different solid form than the drug by itself." Alone, a drug may be so insoluble it does not make it into the blood stream. "It might work in a cell, but we just can't get it into our bodies." By forming a co-crystal with another molecule, the drug is modified, and will hopefully be more easily dissolved and taken up into the body.

Dr. MacGillivray also studies ways to control electrical properties of crystals, and he has a patent on the research. We strive to make electronic materials that are flexible, using organics based on co-crystals. "From time to time, you'll see examples in the media of futuristic flat-screen televisions that can bend. We are trying to do the same thing using organic co-crystals that act as semiconductors. Imagine clothes and paint that effortlessly change print and color – and are connected to the internet. For many such applications, organic molecules must also be aligned properly to support electrical current." This may seem like the stuff of science fiction, and for now, it is, but advances in the field of supramolecular chemis-

try are taking these ideas a few steps closer to reality.

These are projects that Dr. MacGillivray has been working on since he came to the University of Iowa as an Assistant Professor in 2000. He started out his chemistry career at Saint Mary's University, in Halifax, Nova Scotia, Canada. He began researching as a freshman undergraduate in the laboratory of Professor Michael Zaworotko (now University of Limerick, Ireland). The undergraduate research was important, because MacGillivray was introduced to X-ray crystallography in his second semester, and he's been using the instrumentation ever since. "Every academic semester, plus every summer, I just did research. I also attended a number of national conferences, and I was fortunate enough to be a co-author of 20 publications as an undergrad. Needless to say, I was extremely fortunate to have met 'Dr. Z,'" recalls Dr. MacGillivray. He was encouraged by Professor Zaworotko to apply for a scholarship through the Natural Sciences and Engineering Research Council (NSERC) of Canada (the NSF of Canada), and he won one of 100 graduate school scholarships that celebrates the 100th anniversary of Canada. Dr. MacGillivray obtained his PhD at the University of Missouri-Columbia, where he worked with Professor Jerry Atwood. He then joined the National Research Council (NRC) of Canada in Ottawa, as a Research Associate, before he came to Iowa. It was as an undergrad that he became hooked on supramolecular chemistry and while at Iowa he has introduced two undergraduate experiments on solid-state and supramolecular chemistry where over 1000 students have now performed the experiments. "I am hoping similar sparks of interested can be ignited", says MacGillivray.

*Ellie Keuter*



# MIMICKING NATURE

## *Porous Inorganic Materials from Plant Leaves*

For the past several years, Dr. Ed Gillan and the students in his research group have been working on new ways to grow porous inorganic structures that mimic the exotic beauty and structural complexity of simple plant leaves. Plants have evolved a sophisticated vascular and cellular structure to harness light for photosynthesis and move nutrients across long distances. The Gillan group desires to use plant leaves as botanical templates to create biomorphous inorganic structures that may have applications in solar energy capture and energy conversion, in bioinspired chemical catalysis including desirable water splitting reactions, and in electrochemical energy storage systems.

Scientific research often finds its inspiration in unexpected places and that holds true for this project. During an autumn day several years ago, Dr. Gillan recalls picking up a dried

leaf on the ground and wondering if its structured cellulose form could somehow be useful as an organic template for inorganic metal oxide coatings grown on the leaf's internal and external surfaces. With this initial idea, he wandered through the greenhouse of a large Iowa City nursery looking for plants with interesting shapes and many small leaves that would also be easy to grow and replenish, as this would be necessary for his group to use them on a frequent basis. His plant choices were based on visually morphologies from long and thin fern leaves, to thicker ZZ leaves, to very water rich Jade succulent structures. As a side benefit to this research, Dr. Gillan's office window sill is now rich with indoor plant foliage as it serves as his lab's local nursery.

An early challenge to overcome in using plant leaves as materials templates was how to gently remove all of their internal water without causing the delicate cellular and vascular structures to collapse. Air or oven dried leaves show flattened structures when imaged by electron microscopy and access to internal surfaces is heavily obstructed. A Gillan group grad student, Andrew Zimmerman, applied a very old

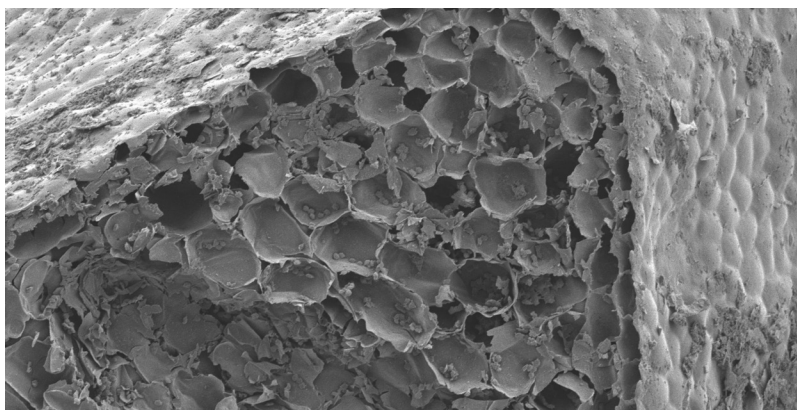


biological specimen dehydration method to their leaves so that they would retain their size, shape, and porous structure after dehydration. The reaction to dehydrate the freshly cut leaves is surprisingly simple — the leaves are thoroughly soaked in a solution of dimethoxypropane that reacts with water reacts in 1:1 manner to produce volatile methanol and acetone. The chemically dried leaves weigh about five percent of their original wet weight and feel like flexible foam packing bead.

The Gillan group has introduced a variety of inorganic liquid precursors and dissolved metal salts into the dehydrated botanical leaf templates and subsequent heating in air to over 450°C leads to leaf combustion to volatile materials and what remains in an inorganic oxide with structures that mimic the shape or the original leaf, both internally and externally. One example is the synthesis of porous titanium dioxide or titania that exists in two forms, photoactive low-temperature anatase and high temperature rutile. The anatase form has a semiconducting band gap and light absorbing properties that make it popular as a nanoscale photovoltaic (solar cell) component.

The Gillan lab has grown titania on a variety of leaf templates and begun examining them in photocatalytic reactions. They have introduced small few percent amounts of other transition-metals into the titania structure to grow doped titanias with visible colors. This may lead to improved visible light absorption properties for titania, which is white as it has a UV band gap. The porous leaf templated structure should also make it easier to transport redox active species in and out of the structure. “I believe that our porous structures may bridge the gap between isolated nanoparticles and larger crystalline systems, perhaps benefiting from the advantages of both to effectively perform catalytic chemistry or light harvesting” says Gillan. The Gillan group is also collaborating with Dr. Johna Leddy’s electrochemistry students to identify potentially useful porous templated metal oxides such as cobalt or nickel oxides in electrochemical energy systems, including batteries, supercapacitors, and electrochemical water splitting.

Dr. Gillan feels very fortunate to have the opportunity to explore unusual areas of synthetic and applied materials chemistry as a chemis-



An electron microscopy image of a chemically dehydrated Jade plant leaf.

try faculty member at UI. He arrived here as an Assistant Professor in 1997 after postdoctoral research with Dr. Andy Barron at Harvard and then Rice University (yes, he transported a research lab halfway across the country during his postdoc!). His interest in materials chemistry and exotic syntheses dates back to his late 1980’s undergraduate research at UC Berkeley with Dr. Neil Bartlett, who famously discovered the first noble gas compound xenon hexafluoroplatinate in 1962 as a 29 year-old professor at the University of British Columbia. Dr. Gillan’s love of exotic synthetic methods further grew at UCLA during grad school in Dr. Ric Kaner’s group. Speaking of his grad school days, “It was a great time in the Kaner group. We built reactors, measured materials properties, and designed some excitingly energetic reactions! It was also where I discovered I enjoyed teaching students chemical concepts in addition to loving the excitement of laboratory research.”

When asked about his most important career achievement thus far, Dr. Gillan says “It’s the students I mentor in my research group. They come in with a lot to learn, both knowledge and lab skills, and it is really gratifying when they are successful enough to earn their doctoral degree and go off to start their own careers. I would say that those things are actually much more satisfying than getting tenure. Tenure is kind of an outcome of the things that naturally happens as the research group works successfully together.”

**Ellie Keuter**

# MIMICKING NATURE

## *Porous Inorganic Materials from Plant Leaves*

Dr. Nicole Becker recently joined the University of Iowa faculty as an Assistant Professor of Chemistry Education. She earned a B.S. in chemistry from South Dakota State University in 2004 and a Ph.D. in chemistry education from Purdue University in 2012. She became interested in chemistry education research during a volunteer teaching experience in Namibia (southern Africa) where she taught high school chemistry, biology and math. From this experience she learned that being an effective learner was not necessarily enough to make one an effective teacher. “There were some teaching and learning dynamics going on that I didn’t understand just from learning chemistry myself. In very large part, this is what motivated me to go on to study chemistry education,” Becker explained. After returning to the states, Dr. Becker found that she was really interested in teaching, so she continued on to graduate school to study chemistry education.

Dr. Becker completed her doctoral studies at Purdue University in 2012. Her dissertation work was in discipline-based education research. Specifically, she studied how students learn in collaborative learning environments and how students work with other students and the instructors to understand the big ideas in chemistry. From there, she moved on to Michigan State University to work as a postdoctoral scholar. Her work was to develop curriculum materials and redesign how key concepts, like energy and molecular structures, are taught in the general chemistry course sequence. The aim of this work was to improve both students’ conceptual learning and their experience in chemistry courses. Evaluation of the instructional materials developed in this research suggested both short and long-term gains in student learning, as measured by performance on nationally normed test (such as the ACS exam) and performance in subsequent chemistry courses.

Dr. Becker’s current research is focused on how students understand and use models of chemical systems in introductory chemistry courses. Her work is motivated by the fact that to date, re-

search shows that students often use models such as mathematical and graphical representations in predominantly algorithmic ways. “This is problematic,” says Dr. Becker, “because you have to understand the nature and purpose of the model and the conditions under which it would be valid to be really successful in problem solving.” The primary objective of this research is to identify more meaningful ways to engage students in model-based reasoning. Some of these educational innovations include engaging students through discussion-based learning environments. However, Becker says “It’s not enough to just change the way we teach. We have to change the way we assess students, so that we have a coherent curriculum.” Becker contends that developing more effective assessments will also provide a way to evaluate the impact of curricular innovations, on students’ learning.

“The difference between experts and novices in chemistry is how students see problems are related,” explains Becker. “Experts use different strategies like chunking to store more information. You’re able to use your knowledge in different ways. Helping students to make those connections is the most critical thing about instruction, and the most rewarding.”

### ***Lindsay Elliot***





# MIMICKING NATURE

*Porous Inorganic Materials  
from Plant Leaves*

Dr. Scott Daly joins the University of Iowa chemistry faculty as an assistant professor. He comes to us from George Washington University in Washington D.C., where he has been an assistant professor since 2012. Dr. Daly took a rather nontraditional path to chemistry. Born in Illinois and raised in Florida, he enlisted in the army after graduating from high school. He was stationed in Fort Hood, Texas, where he was a tank operator for three years. Dr. Daly then attended Joliet Junior College, where he started out as a business major before switching to pre-pharmacy. In becoming a pre-pharmacy student, he took his first chemistry class. "That's when it clicked," says Daly. "I remember taking my second general chemistry course and that's when I decided that this was for me. Everything I did after that point reinforced my career trajectory." He transferred to North Central College in Naperville, Illinois, declared as a chem major, and spent the final two years of undergrad interning with Eichrom Technologies as a radioanalytical chemist. Upon graduating with a BS in 2006, he went on to graduate school at the University of Illinois at Urbana-Champaign. There, he completely switched fields and studied inorganic chemistry with an emphasis on synthetic actinide and lanthanide chemistry. After earning a PhD in 2010, he received the Seaborg postdoctoral fellowship and moved to New Mexico to perform synchrotron spectroscopy experiments with a team of scientists at Los Alamos National Laboratory. Following his tenure at Los Alamos, Dr. Daly accepted the position at George Washington University, and was very excited to move back to the Midwest with his acceptance of the professorship here at UI.

Dr. Daly's main research focuses are the synthesis of reactive metal complexes for small molecule transformations and the development of new chelators for radiopharmaceuticals. Dr. Daly is also really interested in how changing ligands can affect metal-ligand bonding as it relates to reactivity. They use high-energy X-rays to access the types of transitions that gives them information about metal-ligand bonds. The group frequents the Stanford



Synchrotron Radiation Lightsource and spends about three weeks a year performing experiments at Stanford. "In a lot of groups, people are focused on making compounds or taking measurements, but in our group, we do both. We not only make the compounds that we're interested in, but we also take the measurements at the synchrotron facilities. It gives us an advantage over other groups."

Dr. Daly also has a hand in developing new coursework in the chemistry department. The new integrative lab course, Synthesis and Measurement, is a combination of advanced analytical, physical and inorganic laboratory courses. The course is designed to give BA students exposure to the synthesis and characterization of materials that they may not have had, without the advanced lab courses required of the BS degree. Dr. Daly will be piloting the course with Dr. Gary Small in the Spring 2015 semester.

When asked about what he's most excited about with beginning his tenure at UI, Dr. Daly says "Everything. The enthusiasm of the group members. The facilities here are top notch. The university and the department as a whole are doing a great job offering resources that really help us get the science done. That goes for everything from having Benj (the departmental glassblower), the instruments and instrumentation, the electronics shop, Chemistry Stores, and even the design of the building and the research spaces. Everything is set up to do top notch science. And that's one thing we don't have to worry about. It allows us to really focus on the science."

**Lindsay Elliot**

# THE IOWA CLIMATE FESTIVAL

The Iowa Climate Festival, held Saturday, April 26th at the University of Iowa Museum of Natural History, attracted a crowd of approximately 200, introducing the public to climate science and the implications of climate change for Iowa. The Festival featured a morning symposium with faculty from the University of Iowa and speakers from the State Hygienic Laboratory, the Iowa Department of Natural Resources, and the US Department of Agriculture. In the afternoon, a family-friendly climate-science fair gave the public a chance to experiment with cloud formation, water's surface tension, an ocean-acidification simulation, the effects of albedo on surface temperature, and other aspects of climate science. Biofuel and energy-conservation exhibits received steady interest. A paleoclimate presentation by Don "The Fossil Guy" Johnson kept younger attendees rapt for an hour, and an ice cream social in the Museum's Biosphere Hub proved a popular attraction. University of Iowa Libraries staffed a table about climate science, and have assembled public resource materials for those interested in learning more about climate change ([www.guides.lib.edu/icf](http://www.guides.lib.edu/icf)).

Daniel Reed, Vice President for Research and Economic Development, opened the Festival, telling the crowd, "We live in a world of punctuated equilibrium. If we don't do something radical and we don't do it soon, there will be irreversible consequences." Symposium speakers echoed Reed's concern, speak-

ing about aerosols, greenhouse gases, and the earth's energy budget, as well as possibilities for mitigating the effects of climate change in agriculture and public health. Dr. Vicki Grassian remarked, "I feel like we're making a difference in people's lives by better understanding the environment."

Following Grassian were the Dr. Charles Stanier, Associate Professor of Chemical and Biochemical Engineering; DNR Environmental Specialist Marnie Stein; Jerry L. Hatfield of the USDA; Professor Jerry Schnoor of the Department of Civil and Environmental Engineering; and Wanda Reiter-Kintz of the State Hygienic Laboratory, who specializes in emergency preparedness.

Sarah Horgen, Education Coordinator at the UI Museum of Natural History, called the ICF a remarkable success for a new event, and hoped that ongoing collaboration with the Department of Chemistry would allow the Museum to host a Climate Festival that the public could come to expect each spring.

The Iowa Climate Festival was organized by Assistant Professor Betsy Stone, and was made possible by a Climate Science Challenge Grant from the American Chemical Society. Dr. Stone and Professor Len MacGillivray, current Secretary and Chair of the Iowa section of ACS, received the grant in 2013. The Iowa section hosted the Festival in partnership with the University of Iowa Department of Chemistry, Museum of Natural History, Office of Sustainability, State Hygienic Laboratory, National Science Foundation, Center for Aerosol Impacts on Climate and the Environment (CAICE), and the City of Iowa City.

Detail from the MFA show *Iowa River Ideology/Function* (2011) by Brendan Baylor.





# AWARDS AND NEWS

## **Faculty Awards**

**Professor Alexei Tivanski** achieved tenure and was promoted to Associate Professor. Prior to joining the University of Iowa in 2007, Professor Tivanski was a Postdoctoral Research Associate with the Chemical Sciences Division of Lawrence Berkeley National Laboratory. He received his Bachelors of Science and Masters of Science in Physics and Mathematics from the Moscow Institute of Physics and Technology, before going on to receive his Ph.D. from the University of Pittsburgh. Professor Tivanski's current work focuses on a single molecule level study of the mechanical, optical and conductive properties of molecular junctions composed a few molecules up to molecular films that will enable the design and fabrication of molecular devices with useful electrical, mechanical and optical properties.

**Dr. Tori Forbes** was named a Distinguished Mentor at the Office of Vice President for Research and Economic Development inaugural Distinguished Research Awards. Distinguished Mentor Awards are presented to University of Iowa faculty or professional and scientific staff who have mentored undergraduates as they complete research and creative projects. Current students nominate their mentors for this award.

**Dr. Johna Leddy** was named a Fellow of the Electrochemical Society at the fall meeting and San Francisco. The University of Iowa fared quite well at the Iowa Women of Innovation Awards, presented by the Technology Association of Iowa. Dr. Leddy was a finalist in the Iowa Women of Innovation Awards in the Research and Innovation and Leadership category. Her student, Krysti Knoche, was the winner of the Iowa Women of Innovation Awards Collegian Innovation and Leadership category. Dr. Renee Cole won the Iowa Women of Innovation Award for Academic Innovation & Leadership (Post-Secondary).

**Professor Vicki Grassian** was thrice honored during this past year. She was named the 70th recipient of the ACS Midwest Award. This award is given by the St. Louis Section of the ACS to publicly recognize outstanding achievements in chemistry in the Midwest region. Professor Grassian, who joined the faculty at the University of Iowa in 1990, received the Midwest award for her exemplary contributions to chemistry, that span the areas of heterogeneous atmospheric chemistry and health and environmental implications of nanoscience and nanotechnology, her outstanding teaching accomplishments and innovations, and for her exemplary mentoring, particularly of women. Professor Grassian has over 250 peer-reviewed publications and she has mentored over one hundred students and postdocs in her laboratory. The 2014 Midwest Award will be presented to Professor Grassian at the 49th Midwest Regional ACS Meeting to be held at the University of Missouri-Columbia from November 12-15, 2014. An awards symposium and Professor Grassian's award address will be on Thursday, November 14, 2014.

**Dr. Vicki Grassian** was also named the 2014 Scholar of the Year at the Office of the Vice President for Research and Economic Development inaugural Distinguished Research Awards. The Scholar of the Year Award honors a tenure, research, or clinical track faculty member for nationally recognized achievements in research.

**Dr. Grassian** has received the 2014 John Jeyes Award by the Royal Society of Chemistry. This is a prestigious award in recognition of Vicki's many contributions in the area of environmental chemistry of heterogeneous atmospheric surfaces. The John Jeyes Award, founded in 1975 through an endowment from the Jeyes Group, commemorates the initiative of inventor and scientist John Jeyes. In 1877, John Jeyes filed a patent for his disinfectant liquid. Over 130 years later, the Jeyes Group still uses his formula to produce the classic Jeyes fluid. Jeyes was granted the Royal Warrant in 1896 and the Jeyes Group is still proud to supply the UK's Royal Household. As this year's recipient, Dr. Grassian received £2000, a medal and a certificate. She will also complete a lecture tour of the United Kingdom.

The Department of Chemistry wishes Professor Donald J. Burton a very Happy 80th Birthday! Professor Burton retired from the Department in 2007, but has continued to remain active, regularly publishing papers and maintaining close ties with current faculty and staff. His research interests are mainly in the area of synthetic and mechanistic organic chemistry, particularly in the development of new reagents for introduction of fluorine into organic compounds. He is particularly well known for the development of trifluoromethylcopper reagents, and other organometallic species that accomplish site-specific introduction of fluorine. Over his career he was the recipient of many awards, including the Governor's Science Medal for Scientific Achievement, and was highly influential in the American Chemical Society Fluorine Division for many years.

Professor Burton and his family have remained highly supportive of the Department of Chemistry throughout the years, most recently with the introduction of the Donald J. and Margaret Burton scholarship. This scholarship is an annual award given to a chemistry major who demonstrates outstanding academic achievement in the classroom and in his/her research.

### **Staff News**

Several Staff members were honored over the past year. Dr. Fu Chen, the Assistant Director of the NMR facility, was awarded the Mary Louise Kelley Professional Development Award. This enabled him to attend a national level NMR Spectroscopy conference. Benjamin Revis, our Glassblower, received the Mary Jo Small Staff Fellowship Award. Benj, who is active in the American Scientific Glassblowers Society, was able to attend and present at the national ASGS conference.

**Dr. Santhana Vellupillai** was recognized for 10 years of service to the College of Liberal Arts and Sciences.

**Brenna Faler** was recognized for her outstanding service to the department. Brenna is the Linux/UNIX systems administrator.

**John Hawkins** retired after 10 years of service to the University of Iowa, with the last 5 years in Chemistry, and we wish him the best!

We have had several new staff members join us as well. Nicholas Francisco joined us as senior financial analyst to replace the retiring John Hawkins. Peter Franke and Bryan Ringen joined the IT staff as support consultants. Jenny Nelson joined the NNI staff as the administrative support professional, and Ellie Keuter just recently joined the staff as the manager in the Chemistry Center.

### **Student News**

**Changhui Xu** was awarded the Outstanding Student Poster Award in the Physical Chemistry division at the 248th National ACS meeting held in San Francisco, CA. Changhui is a member of the Margulis Research Group. His poster was titled "Early solvation dynamics of an excess electron in aliphatic ionic liquids coupled with the bis(trifluoromethylsulfonyl)amide anion", with co-authors Aleksander Durumeric, Hemant K. Kashyap, Jorge Kohanoff, and Claudio J. Margulis.

**Juan Carlos Araque**, a member of the Margulis Research Group, was awarded the American Chemical Society Poster Award at the 2014 Gordon Research Conference on Ionic Liquids, at Sunday River Resort in Newry, ME. Dr. Araque's poster was titled "Disparity in the Diffusion Mechanisms of Neutral vs. Charged Solutes in Ionic Liquids," and was developed with co-authors Sharad Yadav, Mark Maroncelli and Claudio Margulis.

**Kristin Hutchins**, a graduate student at the University of Iowa Department of Chemistry and a member of the MacGillivray Research Group, received a 1st Place award for her oral presentation at the recent Midwest Organic Solid State Chemistry Symposium, held here in Iowa City. Her talk was entitled "Photochromic Co-crystals of a Salicylide-aniline Involving Planar Dihedral Angles".

**Andrew Knight**, a second-year graduate student in the Department of Chemistry, is the recipient of an Honorable Mention in the 2014 NSF Graduate Research Fellowship Program competition, finishing among the top 30% of this year's 14,000 applicants. Knight is one of only three students at UI to win an Honorable Mention, which carries access to the XSEDE, a national supercomputing and digital resources facility. His honor has been recognized by the Graduate College with a \$2500 award.



**Riley Svec**, a junior chemistry major in Professor Hien Nguyen's group, has been selected to receive an ACS Division of Organic Chemistry Summer Undergraduate Research Fellowship. This fellowship is for research to be carried out in the summer of 2014 at the University of Iowa in the lab of Professor Nguyen. This is a national competition fellowship, and about ten undergraduate students will receive this fellowship annually. In addition to financial support, the award provides funds to attend an industrial campus for a dinner, award session, scientific talks and a poster session. Svec will attend a poster session this fall at the Pfizer Global Research and Development site in Groton, CT,

**Liam Hovey**, University of Iowa junior, a chemistry and physics major, has received a 2014 Goldwater Scholarship, the premier undergraduate award for students in science, technology, engineering, and mathematics. Hovey, who will receive up to \$7,500 in funding for tuition, fees, books, and room and board, plans to pursue a doctoral degree and perform research in structural biology and electrophysiology with an emphasis in pharmacological applications.

**Thomas Heiderscheit**, a Chemistry Major at the University of Iowa and native of Ankeny, is one of six recipients of the John and Elsie Mae Ferentz Research Fund Award. Heiderscheit received the award for the Spring 2014 semester. The recipients of the award receive \$1000 and will complete an undergraduate research project, honors thesis course, guided independent study project or capstone course during the semester. Heiderscheit is a member of the Haes Research Group.

Outstanding Teaching Assistant Awards are conferred annually by the University of Iowa Council on Teaching to honor and recognize teaching assistants from across the entire University who have demonstrated outstanding ability as teachers at the University of Iowa. Department of Chemistry recipients for the 2013-2014 academic year include Robert Matthiesen (Wiemer Group) and Justine Olsen (Messerle Group).

The Department of Chemistry also strives to recognize excellence among its TAs with our own teaching awards. Awardees for the 2013-2014 academic year were Andrew Duncan (MacGillivray Group), Christopher Kassl (Pigge Group), Antonio Lucio

(Shaw Group), Holly Morris (Tivanski Group), Samantha Nania (Shaw Group) and David Stockdale.

In honor of A. Lynn Anderson (1940-2008), PhD. In Chemistry in 1970, the Lynn Anderson Research Excellence Awards was awarded to Tatiana Mishanina of the Kohen Group. This award is presented annually to graduate students displaying excellence in Research.

Shriner Fellowships are awarded to outstanding graduate students in Chemistry. The Shriner Fellowship was established in 2000 by Dr. Fred Rath and the late Mrs. Bonnie Rath in honor of Dr. Ralph Shriner, long-time professor and DEO in our Department. The 2013-2014 Shriner Fellows was Jonathan Goeneboom.

### ***Undergraduate Awards***

Senior Chemistry Alumni Award: Dan Grigsby  
Junior Chemistry Alumni Award: Michael Vinyard  
Sophomore Chemistry Alumni Award: Alyssa Hopman

CRC Freshman Chemistry Award : Zesen Lin

Merck Index Award: Elise Borja & Ben Weidemann

American Institute of Chemists Award:  
Catherine Suchanek

ACS Division of Organic Chemistry Outstanding Senior Chemistry Student: Benjamin Foust

ACS Division of Inorganic Chemistry Outstanding Senior Chemistry Student: Colton Jensen

Analytical Chemistry Award: Thomas Heiderscheit

Ken Sando Undergraduate Scholarship: Judy He

Russell K. Simms Scholarship: Michael Dolan,  
Timothy Strutzenberg and Riley Svec

Donald J. Burton & Margaret A. Burton  
Scholarship: Liam Hovey E.

David Cater Scholarship: Haley Mathews

Viksnins, Harris & Padys Poster Awards:  
Kevin Frey, Thomas Heiderscheit and Jason M.

## **Undergraduate Events**

The Department has kept our undergraduates busy this fall, with several events geared first towards showing undergraduates what it's like to be a Chemistry major, and then providing them with an idea of what you can do with a degree in Chemistry.

This year, the Chemistry Undergraduate Open House was held on October 1. It is designed to engage students while showcasing Chemistry as a relevant, exciting, and worthwhile career choice; while potentially persuading undecided undergraduates to consider Chemistry as a degree choice, and to inform Chemistry majors of the resources they have available to them within the Department of Chemistry.

A huge thanks goes out to those affiliate groups that participated in sharing resources they offer as well as providing demonstrations of various chemical reactions. Without their involvement the event would not have been the success that it was. The groups include:

American Chemical Society  
Electrochemical Society  
Alpha Chi Sigma: helped organize demonstrations  
National Organization for the Professional Advancement of Black Chemists and Chemical Engineers Iowa Center for Research by Undergraduates Library Sciences  
BA/MAT Program: Chemistry and Teaching  
Betsy Stone Research Group:  
Environmental Chemistry Demonstration  
UI Scientific Glass Shop: Glassblowing Demonstration

Activities outside of the tables included a visit by Herky the Hawk, popcorn, and a self-guided tour of the Cobalt Lounge (Undergraduate Majors Lounge), Technetium Station (Windows computer room), Einsteinium Station (Mac computer room), Platinum Hub (TA office hours room), Library, and Chemistry Center.

Our Career Day was held on October 4<sup>th</sup>. This included a panel discussion showcasing several of the various careers available in Chemistry. Featured panelists came from a wide variety of chemistry fields, and highlighted University of Iowa alumni. Speakers included Dr. John MacMillan, a 1999 University of Iowa graduate who did research with Dr.

Dave Wiemer. Dr. MacMillan is currently an associate professor in the Department of Biochemistry at the University of Texas Southwestern Medical Center, where his laboratory focuses on the discovery and biological characterization of natural products from microorganisms.

**Melissa Torres** is a formulation scientist for Unilever HPC. One of her most esteemed accomplishments thus far is the first full launch of the facial cleansing line for Pond's Men, with markets that include India, Thailand, Indonesia, and China.

**Dr. Robert Harris** earned a Bachelor of Science degree in chemistry from the University of Iowa. He earned a Ph.D. in synthetic organic chemistry from the University of California, Berkeley, and a Juris Doctorate cum laude from Widener University School of Law. Bob worked in the patent department of Zeneca pharmaceuticals for five years, and he has been in private practice since 1997. Bob is a member of the Minnesota bar, a registered Patent Attorney, and a Partner in the law firm of Viksnins Harris & Padys PLLP.

**Tristan O'Toole** graduated from the University of Iowa in May, 2007 with a B.S. in Chemistry. In July, 2007 he started his professional career with Cargill, Inc. as a chemist at the Blair, Nebraska facility. He has been actively engaged in recruiting undergraduates for internships with Cargill as well.

**Duane Kruse** graduated from the University of Iowa in 1970 with a B.S. in Chemistry and a minor in secondary education. After graduation, he taught chemistry, physics and physical science in public high schools before moving on to consulting work.

After a lively discussion with the panel, followed by an opportunity for students and panelists to sit down over lunch and engage in more informal discussions, students could attend a session titled "Use of Technologies to Enhance Your Career", presented by the American Chemical Society. Finally, students had the opportunity to sit down for one-on-one resume building and critique sessions.

*If any alumni are interested in being panelists or assisting in future Career Day events, please contact the Department.*



# DISTINGUISHED VISITING SCHOLARS

## **David Walt, Leo and June Davis Frontiers Lecturer**

The Frontiers Lecture series brought Professor David R. Walt of Tufts University visited the department over three days in April 2014 for the Leo and June Davis Frontiers Lectureship. Dr. Walt presented a series of three lectures related to his research in bioanalytical chemistry, materials chemistry, biochemistry, and nanoscience: “Random Arrays for Multiplexed Bioanalysis,” “Single Molecule Measurements for Ultrasensitive Detection and Fundamental Enzymology,” and “How Do We Measure Scientific Impact?”

Dr. Walt is Robinson Professor of Chemistry at Tufts, as well as a Howard Hughes Medical Institute Professor. He is the Founding Scientist of Illumina, Inc. and Quanterix Corporation, and acts as Director and Chairman of the Scientific Advisory Board for both companies. His work on fiber-optic microarray technology for biomolecule detection and single molecule analysis is world-recognized, and has many practical applications, such as improving detection of infectious diseases and diagnostics for cancer biomarkers, and answering fundamental questions on basic biological processes such as enzymology and protein folding. His research group also develops microfluidic and optical trapping methods for automated single molecule and single cell analysis.

The 2013-14 Frontiers Lectureship was made possible by a generous contribution from Dr. Leo and June Davis. A professor emeritus in chemistry, Dr. Leodis Davis served in a number of administrative positions at the University of Iowa from 1979 to 1994, including Chair of the Chemistry Department; Assistant Dean, College of Liberal Arts; Acting Dean, Graduate College; and Senior Associate Provost. June Davis began her UI career in Residence Services in 1976, eventually serving as Acting Director of Affirmative Action, Assistant to the VP of Finance and University Services, and Assistant Vice President of Finance and University Services from 1991 to 1997.



Dr. Mark Arnold, Dr. Leo Davis, June Davis, Dr. David Walt.  
Photo credit: Jill Tobin, University of Iowa Foundation

## **Gary Molander, 2014 Wawzonek Lecturer**

On Friday, April 18, 2014, the 12th Stanley Wawzonek Lecture, “A Novel Mechanistic Paradigm for Cross-Coupling”, was presented by Dr. Gary Molander, Hirschmann-Makineni Professor of Chemistry at the University of Pennsylvania.

Dr. Molander, a 1979 alum of Purdue University, joined the University of Pennsylvania faculty in 1999, after 18 years as a faculty member at the University of Colorado, Boulder. His research interests focus on the development of new synthetic methods for organic synthesis, with focuses on the application of organolanthanide reagents and catalysts to selective organic synthesis, the development of organotrifluoroborates as cross-coupling reagents, and the use of bisboronic acid as a borylating agent for the synthesis of a variety of organoborons. He has received several honors for his research and teaching, including an Alfred P. Sloan Foundation Fellowship, the American Cyanamid Academic Award in 1989, the Arthur C. Cope Scholar Award from the American Chemical Society in 1998, and a Japanese Society for the Promotion of Science Fellowship in 2002.

The Wawzonek Lectureship is presented in honor of Professor Stanley Wawzonek (1914-1988). An alum of the University of Minnesota, Dr. Wawzonek joined the University of Iowa in 1944 as a professor of organic chemistry, and served as department chair from 1962 to 1968. During his career, he re-



Dr. Gary Molander

ceived the Iowa Award of the American Chemical Society, the Midwest Award of the American Chemical Society, and the Outstanding Achievement Award of the University of Minnesota. He became a Distinguished Fellow of the Iowa Academy of Science in 1979, and was also active as an editor and consultant.

#### ***Shelley Minter, 2014 CLAS Alumni Fellow***

The Department was greatly honored by the selection of Dr. Shelley Minter, USTAR Professor of Chemistry and Materials and Science and Engineering at the University of Utah, as one of five 2014 Alumni Fellows by the UI College of Liberal Arts and Sciences. The Alumni Fellows program, established in 1999, formally recognizes CLAS graduates and former students for their outstanding contributions to society, their professions, the College, and the University of Iowa.

Dr. Minter completed her PhD in analytical chemistry at Iowa with Professor Johna Leddy in 2000, and has since gone on to gain considerable renown in the field of bioelectrochemistry, with research focused on biofuel cells, biosensors, and enzyme immobilization materials. Her work includes cutting-edge research in enzymes, cellular energy, biofuel cells, and CO<sub>2</sub> sequestration. A winner of the Scientific American Top 50 Award in 2008, and a Fellow of the Electrochemical Society, she holds over forty patents, has published nearly two hundred articles, regularly gives presentations, and receives robust grant funding as the principal investigator on numerous research projects. In 2005, she cofounded Akermin, Inc., a company dedicated to the development of enzyme-based CO<sub>2</sub> sequestra-



Dr. Sarah Larsen, Dr. Shelley Minter, Dr. Johna Leddy

tion technologies based on her patents. Her work has implications for a number of fields, including energy, bioelectrochemistry, and medicine.

Dr. Minter returned to Iowa City to accept this honor at the CLAS Alumni Fellows Celebration, a public ceremony held in the Old Capitol Senate Chamber on Thursday, September 11. She also met with Chemistry faculty and graduate students during her visit, spoke to undergraduates in Professor Leddy's Analytical Chemistry I course, and presented a talk on "Enzymatic Bioelectrocatalysis for Energy Conversion Applications" as part of the department colloquium series on Friday, September 12.



# IN MEMORIAM

**Everette A. Flanders**, 90, Mililani HI. 1949 BS. Mr. Flanders served with the U.S. Army Air Corps during WWII as a B-24 pilot where he earned the rank of First Lieutenant and was awarded Air Medals and three Oak Leaf Clusters. After college, he worked as an engineer for the Army Corps of Engineers until retirement. He was an active member of the Kailua Elks club, and was appointed an Exalted Ruler. Mr. Flanders is predeceased by his wife Frances and is survived by his four children, Michael, Mary, Anne and Richard. Also surviving are three grandchildren and five great-grandchildren.

**Richard E. Dennis**, Tucson AZ. 1963 BA.

**Dr. William Dickey Coder, Jr.**, 80, Naples FL. 1949 BS, 1950 MS. Before becoming an organic chemist, Dr. Coder worked as an air traffic controller in the U.S. Air Force during WWII. Dr. Coder earned a PhD from the University of Delaware, and subsequently worked for Gen Corps in Akron, Ohio, where he retired as the vice president of the Chemical and Plastics Division. Dr. Coder is survived by his wife, Mary Lou, and children Cathy, Steve and Jill. He is also survived by six grandchildren and two sisters.

**Scott T. Cohen**, 83, Miami FL. 1953 BS. Mr. Cohen is survived by his wife Emma, and three children, Juan Carlos, Scott T. Jr., and Sandra. He is also survived by a brother, William, and three grandchildren.

**Gary Lee Asleson**, 65, Charleston, SC. 1970 BS, 1975 PhD. Dr. Asleson taught Chemistry at the College of Charleston for thirty-five years. For a time he was an advisor of the Alpha Chi Sigma Professional Fraternity of Chemists. He also served as church council president at Martin Luther Church on James Island. His sense of humor was "warm" as described by those who knew him. His students say he made difficult topics of chemistry understandable and that he was "the nicest guy you ever could meet." He loved Charleston basketball, golf, and crossword puzzles. He is survived by his wife, Mickey, his daughter, Kristin, his mother Adeline, his brother Brian, his nieces Sarah and Angela, and his nephew Benjamin.

**Dr. William (Bill) W. Boardman**, Oceanside, CA. 1938 BS, 1940MS, 1945 PhD. Dr. Boardman triple majored in mathematics, physics, and chemistry at Coe College in Cedar Rapids. He married his college girlfriend, Ruth. After completing his PhD in physical chemistry, he worked on the Manhattan Project. Later he was a researcher with Lithium Corporation of America and head of the chemistry department

and professor at [ ]. He had patents in [ ]. He was a member of Phi Lambda Upsilon, Sigma Xi, and the American Chemical Society. He was pre-deceased by his wife Ruth, and by his parents Walter and Ferne, and sisters Mildred and Elora. He is survived by his sister, Edith, and by his six children: Ruth, Jeanne, Mary, Martha, Joy, and Bill. And by his 27 grandchildren, and 27 great-grandchildren.

**Dr. Clarence H. Buurman**, Greenville, SC. 1936 BA, 1938 MS, 1941 PhD. Dr. Buurman was vice president and operations manager at Emery Industries. He was a fellow in the American Institute of Chemists and served on the board of the Greenwood Genetic Center. He served as chairman for Youth Exchange Program and hosted over 700 exchange students. After his retirement he went to Kenya where he forded rivers in a Jeep, dug wells, and built schools, and churches. In Kenya he also helped convert an abandoned building into a medical clinic and orphanage for boys whose parents had died of AIDS. In 2002 he was working on a solar cooking project in Nairobi. Later he worked on various farm and water projects in Haiti. His favorite drink was a bracer. He was a Rotary Club member and was awarded the "Service Above Self" award, the highest worldwide honor from the Rotary. He is pre-deceased by his wife Jean [Aljoe Buurman], his daughter Sallie [Callaway], his brother John Adrian and his sister Mathilde [Vander Wilt]. He is survived by three children: John Buurman, Robert and Carol, and 10 grandchildren.

**Dr. Louis Campanaro**, 89, Fullerton, CA. 1949 MS, 1951 PhD. Following completion of his undergraduate degree at Augustana College in Iowa, Dr. Campanaro went to officers training school and achieved rank of lieutenant in the US Navy. After active service in WWII he finished his PhD in Chemistry and went on to work for Dupont, Rockwell, Autonetics, and Ford Aerospace. [He lived in Fullerton for 50+ years]. He is survived by his wife Margaret and children, Michael, Mark, Margaret and Matt.

**Dr. Patrick E. Cassidy**, 76, Austin, TX. 1962 MS, 1963 PhD. Dr. Cassidy played in his high school band. After his PhD he worked with Sandia Corporation, Traco, and Texas State where he taught chemistry for 41 years. He was also associate vice president of academic affairs for 15 years and founded the Polymer Research Group. He published more than 400 papers and received many awards including the Southwest ACS Award, and the University President's Award for Excellence in Research and was named a Fellow for the Polymer Chemistry Division and the Polymer Engineering and Science Division of the ACS. He had [9 patents] and consulted for a handful of legal firms. He retired as distinguished

professor emeritus. He was an elder at his church and cofounder and president of Spicewood Country School. He is survived by his wife, and their children Jeanne, Andrew, Lacey, Melissa, and grandchildren Maya, Max, and Lincoln.

**Dr. Robert Charles Johnson**, Wilmington DE. 1948 MS, 1950 PhD.

**Helen B Bliss Halpern, M.D.**, 94, Evansville IN. 1940 MS, 1946 MD. Dr. Halpern moved to Brooklyn, NY after completing medical school and obtained an internship at Kings County Hospital. There she met her husband Jacob Halpern, M.D. and they had four children together: David Reed, Philip John, Joseph William, and Susan. Dr. Halpern was also a devout member of the Methodist Church, and generously volunteered her time and donated money to various organizations; even in her 80s, she delivered food for those in need for Meals on Wheels.

**Joseph James Forrester**, 87, North Port FL. 1951 MS. Mr. Forrester was a distinguished faculty member who received the award for Excellence in Service of Niagara University in 1993. His recognition for excellence was recognized by his students as well; he was widely known for putting the extra effort into helping his students in his Chemistry sections. Among his many talents, Mr. Forrester will also be remembered for his excellent story telling at Niagara University, NY.

**Dr. Robert Franklin Foery**, 71, Memphis Tennessee. 1972 PhD. Dr. Foery had almost forty years of professional scientific experience, and worked as a toxicologist at AIT. His passion for chemistry was sparked by a copy of Isaac Asimov's *w*, which he read when he was recovering in the pediatric wing after a high school football injury. After earning his Ph.D. from the University of Iowa, he began a two year fellowship in clinical biochemistry and toxicology at the Lehigh Valley Hospital Center. Dr. Foery later launched a new laboratory called MedExpress in Memphis, Tennessee, serving as vice president of technical operations for about seven years. He will be remembered for his expertise in toxicology and admirable work ethic.

**Dr. Shengtian Pan**, 65, Santa Clara, California. 1995 PhD.

**Dr. Lawrence Plummer**, 77, Athens Georgia. 1961 PhD. Dr. Plummer worked in polymer development as a research chemist for DuPont. During his thirty-six year tenure, he worked at the DuPont headquarters in Wilmington, Delaware, and in London, England. Larry is survived by his wife, Jeanne; brother, Leo, and sister-in-law, Kay; his step-children Allison,

Christine and John Shirreffs; daughter-in-law Lisa Shirreffs, son-in-law Rod Johnson; and grandchildren Bryant and Evan Shirreffs.

**Thomas T. Poulos**, 92, South Bend, Indiana. 1943 BA. A graduate of the University of Iowa class of 1943, Mr. Poulos was a member of the Dolphin fraternity swim team during his undergraduate years. Mr. Poulos worked as a chemist for Uniroyal for 47 years. He is survived by his wife, Penelope; his son, Theodore; daughters Andrea Miller and Marina Carlin; and three grandchildren and two great-grandchildren.

**Dr. Arnold Charles Schoenthaler**, 83, East Brunswick, NJ. 1951 BS. Dr. Schoenthaler graduated in 1951 with a BS in chemistry, and then moved to the University of Michigan, where he received a PhD in Organic Chemistry. He then moved to Parlin, New Jersey, to work for DuPont, where he was a research chemist, and later, a supervisor of patent research. After retirement, he taught at Rutgers University and prepared taxes at H&R Block. He is preceded in death by his wife, Lorraine, and his sister, Helen S. Holst. He is survived by his sons Arnold and John and daughter Mary, and six grandchildren.

**Donald Louis Wohlenberg**, 86, Coralville, IA. 1953 BS. Mr. Wohlenberg worked as a chemist for Boeing Aircraft before taking a position at the VA Hospital in Iowa City. He is survived by his daughter Becky, and her husband Kent Pearson; two grandchildren and three great-grandchildren.

**Chris Zogg, J.D.**, 84, Muscatine, IA. 1952 BS, 1962 JD. After graduating from the University of Iowa with a BS in Chemistry, Mr. Zogg served as a pilot in the US Air Force and then went on to complete law school at the University of Iowa. He worked for 30 years for Grain Processing Corporation. He is survived by his wife, Mary Ann; son Mark; daughter, Beth Anne; and two grandchildren.

**Dr. Jack Zomlefer**, 92, Marion, IA. 1943 MS. Dr. Zomlefer started the Leominister, Massachusetts, company Solar Chemical Corporation, and was the president until his retirement. He is preceded in death by his wife Dorothy and his second wife Esther. He is survived by his son, Michael; daughters Kayla and Wendy; and three grandchildren and five great-grandchildren.

**Dr. James T. Sellas**, 80, Sacramento, CA. 1943 PhD.

**Daniel Geltner**, 88, Schenly Gardens, NY. 1936 BA, 1937 MS.

**Dr. Richard L. Johnson**, 75, Myrtle Beach, SC. 1966 PhD. Dr. Johnson worked as a research scientist for DuPont for 35 years. Upon retirement, he moved



to Myrtle Beach with his wife, Terrie, and two dogs, Jack and Max. He is survived by his wife, Terrie; son, Paul; daughter, Amy Burger (Jim); stepdaughter Lori Susan Thorpe Gravely (Kevin); two grandchildren; two stepgrandchildren; two sisters, Nancy Hallstein and Barbara Hustwit; and brother Roger Johnson.

**Dr. Keith Harlan Byington**, 79, Columbia, MO. 1958 BS. After receiving a BS degree in chemistry from the University of Iowa, Dr. Byington went on to earn an MS in physiology and a doctorate in pharmacology from the University of South Dakota. He became a professor of pharmacology at the University of Missouri School of Medicine. He is survived by his wife, Nancy; their four children, Jay Byington (Pat), Pam Mertz (Daniel), Bill Byington (Tammy), and Ann Krohn (Mike); eight grandchildren; and four grandchildren.

**Anton Fassero**, 98, Benld, IL. 1935 MS.

**Dr. William A. Yuill**, 78, Oklahoma City, OK. 1967 PhD. Dr. Yuill received a PhD in Physical Chemistry from the University of Iowa. He went on to work as a paint chemist, and as a nuclear research and safety engineer. He researched metallurgy at Anaconda and Atlantic Richfield, and was a research manager at Kerr McGee. He is survived by his wife, Barbara; daughter, Tamara; sons, Joel, Sean and Brendon; two grandchildren, Jeremy and Madison; brother, Charles; and sister, Pat.

**Ramona A. Mayer**, 85, Columbus, OH. 1956 BA. Ms. Mayer graduated from the University of Iowa with a chemistry degree, while she was receiving treatment for tuberculosis in Oakdale, IA. She worked for Battelle Memorial Institute, where she worked on projects for NASA. She worked to develop freeze-dried food for astronauts. Later in her career, her work was in testing cancer drugs for the FDA. She is survived by a brother, Robert; sister, Stella Eischen; and thirteen nieces and nephews.

**Paul Arthur Merkle**, 98, Salem, OR. 1935 MS. Mr. Merkle is preceded in death by his wife, Caroline and his parents, Frederick and Katherine.

**Richard W. Tingleff**, 85, Peoria, IL. 1950 BA. Mr. Tingleff is preceded in death by his wife, Moira. He is survived by two sons, Richard Tingleff (Shelley) and William Tingleff (Andrea); and two granddaughters, Jenna and Nora.

**Dr. Keith C. Brinker**, 93, West Grove, PA. 1949 MS, 1951 PhD. Dr. Brinker attended the University of Northern Iowa, and got a master's degree from Iowa State University before joining the US Navy in 1944, where he served as the navigator of the USS Hanover. After WWII, he earned a PhD

in Organic Chemistry from the University of Iowa. After graduating, he was a research chemist for DuPont, where he developed plastics used in the auto and space industries. KC was preceded in death by his first wife, Dorothea; his sister, Norma Brinker Jones; his second wife, Adrienne Ayres Reynolds; brother-in-law, Richard Jones; and daughter Karla Brinker Rafferty. He is survived by his daughter, Bonnie Brinker Allison (Michale); son Chris Albert Brinker (Marcia); two step-children, Jennifer Jane Reynolds and Roger Jordan Reynolds; sister Claudia Brinker Kelsey (Robert); son-in-law James Rafferty; seven grandchildren and three great-grandchildren.

**William H. Swab**, 88, Centerville, IA. 1950 BS. Mr. Swab was born in Centerville, IA, and lived there until he joined the Army Air Corp. after his high school graduation in 1944. After WWII, he graduated from the University of Iowa with a BS in Chemistry. He then worked as a chemical engineer for Joseph D. Seagrams Company and 3M. He eventually switched careers and became a securities dealer, and opened up an office in Centerville with Edward Jones. Bill is preceded in death by his parents and his wife, Jane.

**Ester Mark**, 83, Holden, MA. 1954 BA. Ms. Mark worked as a chemical researcher for Roswell Park Memorial Institute in Buffalo, NY. She was fluent in several languages, and enjoyed keeping in touch with her many family members in the US and in Estonia, her country of birth. She is survived by her five children, Dr. Victor Mark (Sandy), Dr. Karen Mark, Loraine Marinone (Dan), Kathryn Pellerite (Peter) and Pamela Waugh (Bill), and nine grandchildren.

**Herbert K. Hoglan**, Los Gatos, CA. 1936 BA.

**Charles E. Lyons**, 84, Midland, MI. 1956 BS.

**Isidore Freed**, M.D., Bayside, NY. 1931 BA.

**Dr. John W. Ryan**, Midland, MI. 1951 MS. Dr. Ryan served in the US Navy during WWII, and received a bachelor's degree from Loras College before coming to the University of Iowa. He worked for Dow in Midland, Michigan after graduating. While working at Dow, he met his wife, Joan, a fellow chemist at Dow. He went back to school to get a PhD from the University of Kentucky, after which he returned to Dow, where he spent the remainder of his 35 year career. In 1978, he finished Harvard Business School Advanced Management Program. He is survived by his wife, Joan; three children, Stuart Ryan (Sarah), Susan Ryan, and Sarah Kenney (Steve); and grandchildren Clare, Will, Matt, Madelyn, Shannon, Maggie, and Alden.

