University of Rochester

Department of

CHEMISTRY

Annual Newsletter

2013-2014

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From the Chair

Greetings to Chemistry Department students, faculty, staff and especially our alumni! I am delighted to share with you some of the developments within Chemistry and the University during this past year, my second as Chair of the Department. I want to start by relaying some news about our Department's greatest resource: the people that have contributed, and continue to contribute, to the success of the Department. Thanks to the personal and financial generosity of so many alumni, especially Dr. Pawel Fludzinski (Ph.D.'83) and Dr. Yuh-Geng Tsay (Ph.D.'77), who tirelessly worked to see this project succeed, the Andrew Kende Chair of Organic Chemistry has reached its goal! The Kende fund is now well over 1.5 million dollars, and will allow us to hire an additional synthetic organic chemist to the faculty. This is a huge achievement in my view, as it allows for the Department to expand its scientific reach and provides a unique opportunity to attract an outstanding senior level organic chemist to Rochester.

The Chemistry faculty continue to accumulate notable awards, the details of which you will read in this newsletter. Rich Eisenberg received the Oesper Award from the Cincinnati section of the ACS, and he delivered his address as part of the Oesper Symposium in October 2013. Daniel Weix was selected as a 2014 Dreyfus Teacher Scholar Award winner, and he was also invited to attend the Kavli Frontiers of Science Symposium in November 2013. Rudi Fasan was the winner of the 2014 Tetrahedron Young Investigator Award in the Bioorganic and Medicinal Chemistry field, which also gave him the opportunity to be a guest editor for a special issue of that journal. Finally, Doug Turner was awarded the 2014 University of Rochester Lifetime Achievement Award in Graduate Education at commencement in May 2014. The Lifetime Achievement Award in Graduate Education is only awarded when there is a deserving candidate, and speaks to the outstanding training and mentorship Doug has generously provided to his students over the years.

Our graduate program continues to expand to levels not seen in Hutchison Hall for some time. Along with 24 postdoctoral fellows, a total of 103 graduate students were enrolled during the academic year 2013-2014 in our Ph.D. program, with 10 students receiving their doctoral degrees last May. The Department welcomed a class of 13 new Ph.D. students in Fall 2014. Even in what seems like the "new normal" of reduced funding levels for science, we are striving to enroll approximately 120 students to form a diverse group of the best and brightest young chemistry scholars. Likewise, our undergraduate program continues to excel, in no small part due to the emphasis on hands-on experiential learning pioneered by Chemistry faculty such as the late Jack Kampmeier. This past year we graduated 42 seniors, and currently we have about 70 chemistry majors in the senior and junior classes. We are proud of the accomplishments of our students, both undergraduate and graduate, many of whom have received a number of awards this year that are listed on our student awards pages.

We are pleased to have been able to make improvements to our departmental infrastructure this year with the completion of laboratory and office renovations for the main Department administrative offices. In particular, we replaced aging (and asbestos-ridden) walls, crumbling ceiling tiles, worn rugs, and old lights

in the main office area to create a modern and welcoming space for students and visitors. This renovation allowed us to create an additional office for our undergraduate program coordinator in the main office suite, along with long overdue and much needed upgrades to the Department Chair office. If you happen to be on campus, I encourage you to come by Hutchison Hall and see the new space!

Despite the economic downturn and the abysmal funding rates for major federal funding agencies, our faculty, and in particular our Assistant and Associate Professors, have been highly successful in competing for federal grant funding to support the research being pursued in the Department. While most other departments of the College are seeing their share of federal funding shrink, ours is growing. In fact, we are now one of the top Departments in the College when it comes to research dollars spent per faculty member. It is no surprise that the future of the Department depends vitally on recruiting and retaining these, and other, vigorous young and mid-career faculty. To that end, in the last year I have been actively engaging the administration of the College to provide more support for our recruiting and retention efforts. I am very pleased to report that our efforts and success have not gone unnoticed. While the details are still to be worked out, the College and the Department have agreed on a framework to expand the faculty size to 24 (from the current 19) over the next 5 to 7 year timeframe. In my opinion, this expansion will allow us to attract top faculty at the "boundaries" of chemistry while still having a robust "core" faculty group as well. I look forward to working with the College to turn this commitment into a reality. I note that the invaluable support of our alumni in aiding these efforts cannot be overstated.

Finally, let me close by thanking all of the alumni for your continuing support of the Department for the past year. One of the defining characteristics of the Department of Chemistry at Rochester is our supportive, collegial community and our continued relationship with our Chemistry alumni. We hope you will remain in touch by visiting Rochester, or dropping in at our annual ACS Alumni Social hour, held each year at one of the national ACS meetings. The next social hour will take place in conjunction with the 250th ACS National Meeting & Exposition in Boston in August 2015. Also, I wish to extend a personal invitation to return to Rochester for Meliora Weekend in 2015, with events running October 8th through the 11th. We will continue to have the annual Chemistry Department Gates Happy Hour on campus in the late afternoon on Saturday of Meliora Weekend. While I can't promise the excitement of a dozen fire trucks and emergency vehicles outside Hutchison Hall during Meliora Weekend, I can promise a special opportunity to acquaint yourself with current members of the Department and reconnect with old colleagues and classmates.

Best wishes for a healthy and rewarding next 12 months. Meliora!

Sincerely,

Todd D. Krauss
Professor of Chemistry and Chair
Professor of Optics

Todd Krauss presenting at the MEL Talks on Meliora Weekend 2013

Donors 2013-2014

Includes donations received between July 2013 and June 2014.

GIFTS OF $100,000+

Barbara J. Burger (B.S.`83)

GIFTS OF $50,000+

Yuh-Geng (M.S.`75), (Ph.D.`77) and
Margaret H. Tsay

GIFTS OF $10,000+

Thomas J. Blacklock (Flw`80)
Thomas J. Perun (Ph.D.`63)
George G. Stanley (B.S.`75)
Margaret M. Wu (M.S.`74), (Ph.D.`76) and
Wuu-Yong Wu (Ph.D.`74)

GIFTS OF $5,000 - $9,999

Bruce D. Roth (Flw`82)

Clock Tower in Dandelion Square

GIFTS OF $2,500 - $4,999

Robert G. Eilerman (M.S.`71), (Ph.D.`75)
Norman P. (B.A.`52), and Mary G. Neureiter
Elliot (B.S.`70), (Ph.D.`75) and Laura K. Richman
Joseph P. Smith (B.S.`72)

GIFTS OF $1,500 - $2,499

Anonymous
Edwin D. (B.S.`52) and Suzanne Becker
Steven J. Lee (Ph.D.`73)
Gazimagomed Magomedov
Mark M. (B.S.`62) and Patricia Rochkind
Seymour Siwoff

GIFTS OF $500 - $1,499

Prudence K. Bradley (M.S.`84), (Ph.D.`88)
Karen Hill Brown (B.A.`61), (Ph.D.`72)
Chiu Shan Chang (Ph.D.`71)
Lloyd H. Conover (Ph.D.`50)
Walter Cooper (Ph.D.`57)
Suzanne S. (M.S.`76) and
Dennis P. Curran (M.S.`77), (Ph.D.`80)
Marcia and Professor Richard S. Eisenberg
Satenik Farid (B.S.`79), (MBA`83S) and
Samir Farid
Wei Fu (M.S.`01) and Jing Zhang (M.S.`98),
(Ph.D.`01)
Yasuhiro Fujii (M.S.`89), (Ph.D.`91)
Kevin Guertin (Flw`93)
Thomas J. Hall (Ph.D.`53)
Thomas A. Henderson (M.S.`83), (Ph.D.`86)
Lori C. Josephson (B.A.`78) and
Richard A. Josephson (B.A.`77)
Frederick D. Lewis (Ph.D.`68)
Lanny S. Liebeskind (M.S.`74 ), (Ph.D.`77)
William J. Linn (Ph.D.`53)
Dean C. Marvin (B.A.`73)
Ronald C. Newbold (M.S.`87), (Ph.D.`90)
Thomas N. Thompson (B.S.`77), (M.S.`81M),
(Ph.D.`85M), (M.D.`85M)
Joseph Weinstock (Ph.D.`52)
David J. Wustrow (M.S. `83), (Ph.D.`86)

Marble Meliora Panel (Hawkins Carlson room) (J. Adam Fenster)

GIFTS OF $250 - $499

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Virginia B.(Ph.D.`64) and Edward A. Caress (Ph.D.`63)
Julie A. Eklund and Scott M. Kampmeier
Shyam B. Karki (M.S.`91), (Ph.D.`95)
Margaret A. Knecht (Ph.D.`67) and Dieter A. Knecht (Ph.D.`68)
Roy A. Leckonby (M.S.`74), (Ph.D.`76)
Ronald M. Levinson (B.S.`56)
Margaret Logan (M.S.`72), (Ph.D.`82), (Flw`88)
Doris W. (B.A.`50) and George W. Luckey (Ph.D.`50)
James B. Philip, Jr. (M.S.`78), (Ph.D.`81)
Zachary K. Sweeney
Mildred Y. Tain (Ph.D.`59) and Robert Tain
Sanford T. (Ph.D.`63) and Margaret Young

OTHER GIFTS

Wesley E. Bentz (Ph.D.`71)
Peter R. Bernstein (B.S.`73)
Sylvia L. Betcher (B.A.`70)
Noal Cohen (B.S.`59)
Mark S. Connolly (B.S.`79) and Deborah Connolly
Richard P. English (B.S.`65)
David J. Hart
William P. Hauser (Ph.D.`61)
Joan E. Johnson (B.A.`64) and Alexander L. Johnson (Ph.D.`64)
Siew P. Ho (B.A.`80), (B.S.`80) and Yuk-Sun P. Lam (M.S.`77), (Ph.D.`81)
Mark E. McGuire (M.S.`82), (Ph.D.`85)
Jose S. Mendoza (M.S.`88), (Ph.D.`91)
Ronald H. Micheels (B.S.`72)
Susan M. Oldham (Ph.D.`99) and Warren Oldham
Kathryn M. Schwartz (B.S.`09) and Brendon M. Lyons (B.S.`08), (M.S.`09)
Albert H. Soloway (Ph.D.`51)
Samuel S. Stradling (Ph.D.`64)
Linfeng Xie (M.S.`87), (Ph.D.`90)

FOUNDATIONAL

Leukemia & Lymphoma Society
Camille & Henry Dreyfus Foundation

NOT-FOR-PROFITS

American Chemical Society
Fidelity Charitable Gift Fund

Alumni News

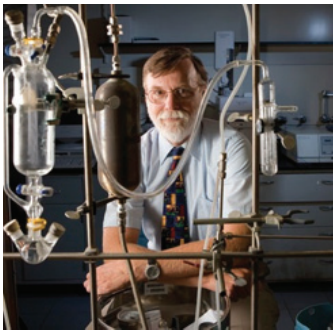
YUH-GENG TSAY (Ph.D. '77), one of the nation's foremost organic/bioanalytical chemists, has been selected to receive The Rochester Distinguished Scholar Award. Over the past five decades, Tsay has been at the forefront of diagnostic medicine, introducing new analytical methods and improving existing clinical tests that pinpoint the presence of small molecules, such as drugs like cocaine, and macromolecules such as viruses, bacteria, and allergens. Thanks to Tsay's dedication as a chemist and entrepreneur, physicians can more accurately diagnose patients, and hospitals can better ensure the safety of those they treat. He has had a distinguished career as a life scientist, business leader, and innovator, and has been an enthusiastic and generous supporter of the Chemistry Department.

Tsay, who left his native Taiwan in 1971, earned his Ph.D. in organic chemistry at the University under Professor Andrew Kende in 1977 with a dissertation on synthesis of anthracylinones. Tsay has more than 70 patents and publications in the areas of synthetic organic chemistry and immunodiagnostics. In 1991, he founded Diagnostic Reagents, a company that established itself with a pioneering portfolio of assays for small organic molecules and drugs. His company's success led to a merger that eventually became Thermo Fisher Scientific, now one of the world's leading pharmaceutical and biotechnology companies. Tsay held several leadership roles with the company before retiring as senior vice president of Thermo Fisher Scientific and group president of its Specialty Diagnostics Business Segment.

The Rochester Area Community Foundation presented **WALTER COOPER (Ph.D. '56)**, with its highest honor in recognition of his many charitable contributions. Cooper received the Joe U. Posner Founders Award at the foundation's annual luncheon at the Rochester Riverside Convention Center on September 18, 2013. Cooper was the first African-American to receive a Ph.D. in physical chemistry at the University and soon joined Eastman Kodak Company as a research scientist, eventually becoming manager of technical communications and manager of research innovation. He published more than 25 scientific papers and obtained three patents in polymerization during his three decades with the company. "I became a scientist because I did not see any black scientists," said Cooper. "I looked around and I saw black doctors, black lawyers, but no black scientists. I chose that as a challenge."

In the 1960s, when race riots rocked the city of Rochester, Cooper became a key African-American leader, respected across divisions in the community. He wrote the original proposal that secured funding for Action for a Better Community and became the organization's associate director in 1964. The following year, he served as associate director of the Rochester and Monroe County Anti-poverty Program and was a founding member of the Urban League of Rochester. In recognition of his engagement in civil rights, Cooper was asked to serve on the New York State Advisory Committee of the U.S. Civil Rights Commission, and he was also selected to receive the Frederick Douglass Medal in 2008.

MICHAEL POSS (Ph.D. '85), currently the director of Millamolecular Chemistry at Bristol-Myers Squibb, is one of the seven scientists of the Bristol-Meyers Squibb team that has been selected to receive the 2014 American Chemical Society Heroes of Chemistry award. Their innovations have led to the discovery of Lomitapide (Juxtapid®), a novel inhibitor of microsomal triglyceride transfer protein (MTP), a treatment for a condition known as familial hypercholesterolemia (FH) which is an inherited, genetic disorder that leads to aggressive and premature cardiovascular disease. Mike was in the research group of Dr. Richard Schlessinger and his thesis was titled "Total synthesis of (+)-rosaramicin aglycone."



The 2014 Ernest Guenther Award in the Chemistry of Natural Products was granted to **DENNIS CURRAN (Ph.D. '79)** for his creative syntheses of natural products and natural product stereoisomer libraries. The award recognizes and encourages outstanding achievements in the analysis, structure elucidation, and chemical synthesis of natural products. In selecting the nominee, special consideration is given to independence of thought and originality. The award is sponsored by Givaudan. Dennis P. Curran received his B.S. in 1975 from Boston College. His Ph.D. was granted from the University of Rochester in 1979 where he worked under Professor Andrew S. Kende. After a two year postdoctoral stay with Professor Barry M. Trost at the University of Wisconsin, Dr. Curran joined the faculty of the Chemistry Department at the University of Pittsburgh in 1981. He now holds the ranks of Distinguished Service Professor and Bayer Professor of Chemistry, and is the founder of Fluorous Technologies, Inc. (www.fluorous.com).

MARK BURKARD (Ph.D. '00) writes: I am currently Assistant Professor of Medicine Hematology/Oncology at the University of Wisconsin Carbone Cancer Center where I co-lead the breast cancer research program. My research group focuses on how phosphorylation events control human cell division and develops therapeutics for treating breast cancer. My wife, Karina, and I have 5 lovely children aged 5-13 who enjoy sports, the outdoors, and videogames (especially Minecraft). The oldest was born in Rochester. We enjoy Madison, but remember our days in Rochester fondly. Amazingly, at least 4 of my colleagues in grad school in the Turner lab are faculty leading research laboratories-- it was a fantastic and exciting place to train. Burkard is pictured with his 13-year old son (born in Rochester) on Isle Royale earlier this year.

NICHOLAS THEBERGE (B.A. '05) is currently in an Oral and Maxillofacial Surgery Residency program at Rutgers in Newark NJ after graduating from dental school in May 2013. He was also married in June 2013, and to the left is a picture of he and his wife, Amanda Manley, on his graduation day from dental school.

DIETER SCHOLZ (FLW '77) shared this update: I worked as a post-doctoral fellow in the Lab of Professor Andrew Kende from Fall 1975 until Spring 1977 together with Dennis Curran and Lanny Liebeskind. After a long career at Novartis and the University of Innsbruck, I finally retired in 2010. I am currently working part time as a synthetic and medicinal chemistry consultant for SES which offers interested retirees the opportunity to pass on their skills and knowledge to others, both within Germany and abroad. It is a very valuable experience teaching at the University of Karachi, and supporting small companies in Uruguay, China and also in Austria. I am married and live in Vienna, Austria, and in our free time we do a lot of gardening, travelling and hiking. I also enjoy reading and publishing once in a while as a free lance journalist.

LIPING CHEN, a postdoc in Ignacio Franco's lab, along with her husband **LINJUN WANG** (an alumni of the Oleg Prezhdo group) welcome their new baby daughter, Mengdian. Congratulations to them both!

T. GREGORY DEWEY (Ph.D. '79) became the ninth president of Albany College of Pharmacy and Health Sciences on July 1, 2014. Prior to joining ACPHS, Dr. Dewey served for five years as Provost at the University of La Verne in California where he oversaw academic affairs, student affairs, student services, enrollment management, financial aid, and athletics for the institution.

Dr. Dewey previously served as Senior Vice President for Academic Affairs and the Finnigan Chair at the Keck Graduate Institute (KGI) of Applied Life Science in Claremont, CA. As a founding faculty member of this pioneering institute, he played a key role in KGI's growth during his ten years at the school, including the development of its groundbreaking Master's of Bioscence program, the first professional master of science program in the country.

Dr. Dewey received his doctoral degree under the guidance of Douglas Turner, and continued his research as a postdoctoral fellow at Cornell University. He began his academic career in 1982 as an Assistant Professor at the University of Denver and eventually rose to the rank of full professor. He spent 18 years at Denver, including five years as Chair of the Department of Chemistry and Biochemistry.

MATTHEW D. DISNEY (Ph.D. '02), an alumni of Doug Turner's group and a professor at the Florida campus of The Scripps Research Institute (TSRI), was selected to receive the 2013 Eli Lilly Award in Biological Chemistry from the American Chemical Society (ACS) in recognition of his outstanding research in biological chemistry of unusual merit and independence of thought and originality. He and his team at Scripps have pioneered a new approach to alter the function of RNA in living cells by designing molecules that recognize and disable RNA targets. Matt was also recently named the 2014 recipient of the ACS David W. Robertson Award for Excellence in Medicinal Chemistry. Given in memory of David Robertson, a widely respected and creative medicinal chemist, the award recognizes seminal contributions to medicinal chemistry by scientists younger than 40. As part of the award, Matt was invited to present a guest lecture at the ACS 2014 Fall meeting in San Francisco.

Former Jones group member, **LINGZHEN DONG (Ph.D. '91),** wrote to Bill recently with an update about her family. She is currently the Senior Director of Asia Pacific Region EHS and Sustainability for Johnson & Johnson in Shanghai, China. Her husband, Lixing Min, has joined Orion Engineered Carbons as their Asia Pacific General Manager. They have recently joined the "George Eastman Circle" in order to thank the Chemistry Department for their excellent educations and career preparation. Their oldest daughter, Julia Min, graduated from NYU in 2010 and now works for Credit Suisse in NYC, and daughter Ellen started at UCLA in Fall 2013.

KUMIKO TANAKA (B.A.'07) is a New England native who grew up in Sudbury, Massachusetts. After attending the University of Rochester, Kumiko worked at Dana-Farber Cancer Institute studying cancer genomics. She moved to Los Angeles to attend medical school at the University of Southern California. After four great years out on the West Coast, Kumiko and her fiancé returned to New England, this time in the beautiful Upper Valley. She chose Dartmouth for several reasons including a supportive environment in a small but distinguished department, abundant research opportunities with all OB/GYN subspecialties and excellent preparation to pursue Fellowship training.

Since starting residency, Kumiko has been impressed with Dartmouth-Hitchcock's institutional commitment to healthcare quality and the strong emphasis on resident education. In their free time, she and her fiancé have been enjoying the outdoors, driving into Boston or entertaining visitors at their lakeside home.

Department Mourns the loss of John R. Huizenga

The department mourns the loss of Tracy H. Harris Professor Emeritus of Chemistry and Physics, John R. Huizenga, who passed away on January 25, 2014.

John Robert Huizenga was born on April 21,1921, in Fulton, Illinois, on the Mississippi Rover, where his parents ran a large farm. He was educated in a one-room schoolhouse until he attended high school. He studied physics at Calvin College, a small Christian school in Grand Rapids, Michigan where he was also a star on the basketball team and played semi-pro baseball.

After receiving his bachelor's degree in early 1944, John was recruited along with many other physics students for the Manhattan Project to help build an atomic bomb. He was assigned to work in Oak Ridge, Tennessee in a facility where small quantities of bomb-grade uranium were isolated from crude uranium ore. He rose through the ranks and soon supervised teams analyzing the purity of enriched uranium, which ended up fueling the weapon that leveled Hiroshima in August 1945. In 1946, John was married to Dorothy "Dolly" Koeze. Their four children, daughters Linda and Jann and sons Robert and Joel, were born in the years 1948 to 1954.

After the war was over, John attended the University of Illinois where he received his doctorate in physical chemistry in 1949 under Professors John DeVries and Frederick T. Wall. John held joint

Huizenga group in the 90's

John Huizenga, 2006

appointments at the University of Chicago and Argonne National Laboratory where he met Dr. Enrico Fermi whose research focused on uncovering the secrets of nuclear interactions. While he was at Argonne, he was part of a team that collected and analyzed the particles in the debris clouds that occurred after the US detonated the world's first hydrogen bomb over Eniwetok Atoll in the Pacific on November 1st, 1952. They discovered that two new elements- highly radioactive and unknown in nature- had formed. These two new synthetic chemical elements were named einsteinium and fermium, and were added to the periodic table in 1955 after a period of imposed secrecy by the government.

During his years at Argonne (1949-1967), John was one of the founders of the Gordon Research Conferences on nuclear chemistry, serving as chairman in 1958. He received a Guggenheim Fellowship in 1964 and took a sabbatical from Argonne to further his studies as a visiting professor at the University of Paris-Sud in Orsay. In 1967, the Huizenga family moved to Rochester, NY where John became a professor of Chemistry

article continued to next page...

UR Chemistry faculty at the symposium celebrating John Huizenga's 85th birthday, April 2006

and Physics at the University of Rochester. He was appointed Tracy H. Harris Professor of Chemistry and Physics in 1978 until his retirement in 1991. He was also the chairman of the Chemistry department from 1983 to 1988.

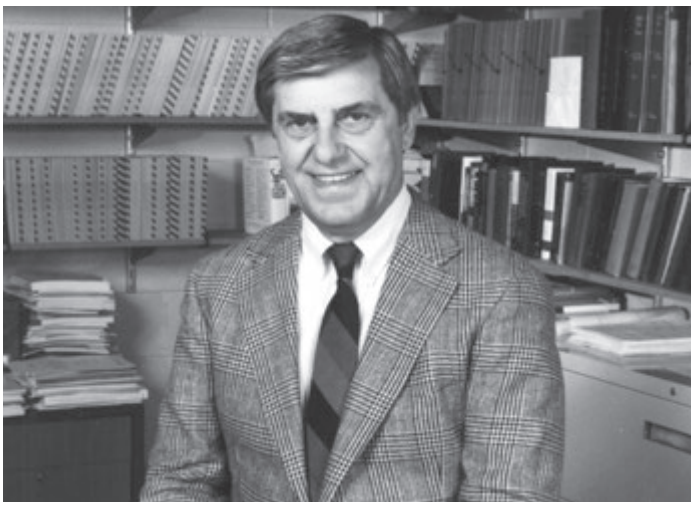
John's research interests in Rochester covered topics such as the nuclear structure of actinides, nuclear fission, and nuclear reactions between heavy ions. He was the recipient of numerous awards for his work, including the E.O Lawrence Memorial Award for Research in Nuclear Fission (1966), the ACS Award for Nuclear Applications (1975), the Distinguished Alumni Award at Calvin College (1975), and the Leroy Randle Grumman Medal for Outstanding Scientific Achievment (1991). John was elected to the National Academy of Sciences in 1976, and as a Fellow in the American Academy of Arts and Sciences, the American Physical Society, and the American Association for the Advancement of Science.

In 1989, chemists at the University of Utah stunned the scientific world with their claims that they had induced fusion reactions in a table-top device at room temperature, a result that would bypass the expensive fusion reactors being built and potentially produce an unlimited supply of cheap energy. They claimed that under an electrical current, atoms of deuterium in heavy water would fuse into tritium in platinum electrodes, releasing usable heat and neutrons. However, attempts to reproduce their results were futile, and the US Department of Energy established the Energy Research Advisory Board, co-chaired by John Huizenga and Norman Ramsey, to investigate their findings.

The panel concluded that there was no evidence of the free neutrons produced by the hypothetical fusion reaction, and careful measurements failed to find any excess heat was produced. John detailed his experiences with this controversy in the 1992 book, "Cold Fusion: The Scientific Fiasco of the Century."

Following his retirement from Rochester in 1991, John and his wife moved to North Carolina, where he continued to serve on advisory committees at major accelerator laboratories, played golf, and wrote his memoir, "Five Decades of Research in Nuclear Science." The John Huizenga 85th Birthday Fest and Symposium was held on April 21-22, 2006 to celebrate John's scientific achievements and his personal impact on the nuclear science and UR community. Several of his former students, associates and colleagues gave talks and shared stories of working with John. Dolly, his beloved wife of 54 years, had passed away in 1999 and John moved to La Jolla California as his health worsened. He died of heart failure last January at the age of 92. John is survived by his two daughters, two sons, two sisters and three grandchildren.

Throughout his 50-year scientific career, John Huizenga was a towering figure guiding research at the frontiers of science, having made exceptional contributions to nuclear science and technology. His legacy continues in the impressive body of knowledge and insights recorded in his many scientific articles and books, and lives on in his students, whose intellectual formation and scientific careers he so markedly influenced.



John Huizenga as department chair from 1983-1988

Doug Turner Receives 2014 UR Lifetime Achievement Award in Graduate Education

Chemistry Professor Douglas H.Turner has been recognized by the University for his contributions to graduate education over his 39 year career at Rochester with the 2014 UR Lifetime Achievement Award in Graduate Education. For Doug, this award is the capstone of an outstanding career as a scholar, researcher, teacher and graduate mentor.

Doug Turner attended Harvard College, where he graduated cum laude in Chemistry and was commissioned as a Second Lieutenant in the U.S. Army Chemical Corp. He did his graduate work in the Chemistry Departments of Columbia University and Brookhaven National Labs, where he worked with George Flynn and Norman Sutin to develop the Raman laser temperature jump method for measuring kinetics on a nanosecond time scale. He did a postdoc with Ignacio Tinoco, Jr. at the University of California, Berkeley where he invented fluorescence detected circular dichroism for measuring the optical activity of the fluorescent component of a solution.

In 1975, Doug joined the faculty of the Chemistry Department at the University of Rochester, where he is now a Professor. During two sabbatical years (1984-85, 1993-94) in Tom Cech's lab at the University of Colorado at Boulder, he learned much biochemistry and biology. Together with his academic family of 9 postdocs, 46 students who have graduated with Ph.D.'s, and other collaborators, he has discovered many of the fundamental principles that determine RNA struture. This has helped advance methods for predicting RNA structure from the sequence which are widely used by biochemists and biologists. He has published over 200 papers and they have been cited over 15,000 times. Doug has also been the recipient of Sloan and Guggenheim Fellowships, a Fellowship of the American Association for the Advancement of Science, the Gordon Hammes Lectureship in 2011, and continuous funding of an NIH grant that started in 1976.

His former students, many of whom contributed to his nomination with enthusiastic letters of support, were unanimous in their recognition of the impact Doug has had, both on their development as scientists, and on them as individuals. A mentor cannot garner higher praise from his former students and colleagues. Congratulations to Doug on this most well deserved recognition!

Hutchison Hall across the Genessee River

Dan Weix Receives Dreyfus Teacher Scholar Award

Congratulations to Chemistry Professor Dan Weix for his selection as a 2014 Dreyfus Teacher-Scholar Award recipient!

Dan earned his B.S. in Chemistry at Columbia University in 2000, and his Ph.D. degree under the direction of Professor Jonathan Ellman at the University of California, Berkeley in 2005. He spent three years as a postdoctoral fellow with Professor John Hartwig at Yale University and the University of Illinois at Urbana-Champaign prior to joining our department. On July 1, 2008, Dan came to Rochester with an extremely strong background in synthetic and organometallic chemistry, focusing on the development of new methods for C-C bond formation used in organic synthesis.

In recognition of the novelty and importance of his published and ongoing work, Dan has also recently been awarded major NIH research support, a Fellowship from the Alfred P. Sloan Foundation (2013), a Thieme Chemistry Journal Award (2013), and a Green Chemistry Award from the Pfizer-Groton Green Chemistry Team (2012). Dan is also an extraordinarily effective teacher at both the undergraduate and graduate levels.

The Camille Dreyfus Teacher-Scholar Awards Program supports the research and teaching careers of talented young faculty in the chemical sciences. Based on institutional nominations, the program provides discretionary funding to faculty at an early stage in their careers. Criteria for selection include an independent body of scholarship attained within the first five years of their appointment as independent researchers, and a demonstrated commitment to education, signaling the promise of continuing outstanding contributions to both research and teaching. The Camille Dreyfus Teacher-Scholar Awards Program provides an unrestricted research grant of $75,000 to the winners.

Dan was also invited to attend the 25th annual Kavli Frontiers of Science Symposium held November 7-9, 2013 in Irvine, California. The 80-100 attendees under 45 were selected from among recipients of prestigious fellowships, awards, and other honors, as well as from nominations by NAS members and other participants. Jointly sponsored by the US National Academy of Sciences and The Kavli Foundation, the Kavli frontiers of Science bring together some of the very best young scientists to discuss exciting advances and opportunities in their fields in a format that encourages informal discussions among participants. These are highly interdisciplinary symposia emphasizing communication of a wide range of contemporary science topics across the traditional disciplines. Dan found it to be one of the most interesting meetings that he has ever attended, with session topics ranging from "asteroids to deep learning to dolphins and nuclear fusion."

Faculty Awards

Rich Eisenberg 2013 Oesper Award Recipient

The Cincinnati Section of the American Chemical Society and Chemistry Department at the University of Cincinnati selected Rich Eisenberg as the 2013 Oesper Award Winner. The Oesper Award is given annually to recognize an outstanding chemist of our time for a lifetime of significant accomplishments in the field of chemistry with long lasting impact on the chemical sciences. Rich received the Award when he spoke at the Symposium held in Cincinnati in October 2013. Congratulations Rich!

Dave McCamant receives Inaugural Lectureship

The Journal of Physical Chemistry and the ACS Physical Chemistry Division created a new Lectureship Award which began in 2013. These annual awards honor the contributions of three investigators who have made major impacts on the field of physical chemistry in the research areas associated with each journal section. Dave McCamant was chosen as the winner of the Journal of Physical Chemistry B Lectureship: Biophysical Chemistry, Biomaterials, Liquids, and Soft Matter. The inaugural award Lectureships were held in September at the Fall 2013 ACS National Meeting in Indianapolis, Indiana.

Rudi Fasan wins Tetrahedron Young Investigator Award

Congratulations to Rudi Fasan for winning the 2014 Tetrahedron Young Investigator Award in the Bioorganic and Medicinal Chemistry field (a second award is given for the field of Organic Synthesis)! These two awards were created in 2005 by the Executive Board of Editors and the Publisher of Tetrahedron Publications and are presented to two individuals who have exhibited "exceptional creativity and dedication" in the fields of Bioorganic/Medicinal Chemistry and Organic Synthesis respectively. Rudi was Guest Editor for a special issue of the Bioorganic and Medicinal Chemistry journal.

Rudi Fasan & Dan Weix chosen to speak at Award Symposium

Rudi Fasan and Dan Weix were chosen to speak at the 8th Organic Young Academic Investigators Award Symposium held at the Fall 2013 ACS National Meeting in Indianapolis, Indiana. The intent of the Symposium is to have the program composed of Assistant Professor speakers who are entering their fifth or sixth years and are not yet tenured. Sixteen speakers were invited to give 30-minute presentations on their work. Dan spoke on "Cross-electrophile coupling reactions: No carbon nucleophiles required" and Rudi addressed the "Synthesis and evolution of organo-peptide macrocycles for modulation of protein complexes."

Todd Krauss Elected OSA Fellow

Professor Todd Krauss has been selected to join the 2015 class of Fellows of the Optical Society(OSA). Todd is being recognized for major contributions to the measurement and understanding of spectroscopy and excited state relaxation dynamics in II-VI semiconductor nanocrystals and carbon nanotubes at both the ensemble and single particle levels. One of his enthusiastic letter writers made the comment, "Todd has clearly distinguished himself as one of the leaders worldwide in the photophysics of nanomaterials. He communicates his ideas very well; he is motivating, enthusiastic and connects with the audience. He has an excellent sense of humor and understands how to capture the attention of the audience. To summarize, Todd's scientific contributions and service to the Optics community need to be recognized. I strongly support his nomination and hope he'll soon be a fellow Fellow."

Todd will be inducted as an OSA Fellow during one of the OSA conferences to be held in 2015. Founded in 1916, The Optical Society (OSA) is the leading professional association in optics and photonics, home to accomplished science, engineering, and business leaders from all over the world.

Melanie Sanford receives the 2013 Magomedov-Shcherbinina Award

The 2013 Magomedov-Shcherbinina Memorial Prize was awarded to Dr. Melanie Sanford on November 14th, 2013.

This prize memorializes the lives of Nabi, Natalya, and Amir Magomedov who lost their lives in a 2006 multi-vehicle accident. Nabi was a rising Assistant Professor of the chemistry department. His wife, Natalya, was a research scientist at Bausch & Lomb. This prize is given to a young scientist who has demonstrated exceptional ability in research in early years of their first independent academic appointment with the promise of outstanding accomplishments in the future.

Melanie S. Sanford is currently the Moses Gomberg Collegiate Professor and Arthur F. Thurnau Professor of Chemistry at the University of Michigan, Ann Arbor. She was born and raised in Providence, Rhode Island, and received her B.S. and M.S. degrees at Yale University where she conducted undergraduate research in the laboratory of Professor Robert Crabtree. She continued her graduate studies at the California Institute of Technology, working with Nobel Laureate Professor Robert Grubbs, where she investigated the mechanism of ruthenium-catalyzed olefin-metathesis reactions. Following postdoctoral work at Princeton with Professor John Groves, she joined the faculty at the University of Michigan in the summer of 2003. She was promoted to associate professor in 2007, to full professor in 2010, and to her current position of Moses Gomberg Collegiate Professor of Chemistry in 2012.

Professor Sanford has been recognized with a number of awards, including a Camille and Henry Dreyfus New Faculty Award, a Beckman Young Investigator Award, a Research Corporation Cottrell Scholar Award, a Presidential Early Career Award in Sciences and Engineering, and has also been named an Alfred P. Sloan Foundation Research Fellow. In 2008 she received an Arthur Cope Scholar Award from the ACS, in 2009 she was the recipient of the BASF catalysis award, and in 2010 she received the National Fresenius Award from the National Chemistry Honor Society and the ACS. In 2011 she was named a MacArthur Foundation Fellow and received the ACS Award in Pure Chemistry.

Research in the Sanford group, which currently has 7 postdocs and 12 graduate students, focuses broadly on the development and mechanistic study of new transition metal-catalyzed reactions for applications in organic synthesis. One area of particular interest involves developing and studying a diverse set of transformations for the direct conversion of unactivated carbon-hydrogen bonds into new functional groups with high levels of chemo-, regio-, and stereoselectivity.

Another area of interest is the development of organometallic catalysts for the direct oxidation of simple alkanes and arenes (e.g., methane and benzene). This is a problem of critical global significance, since natural gas (which is >90% methane) is becoming an increasingly important precursor to carbon-containing chemicals and liquid fuels as petroleum supplies diminish. As part of the NSF Center for Enabling New Technologies through Catalysis (CENTC), the Sanford group has been actively involved in catalyst development to address these important challenges.

Dan Weix presenting Dr. Melanie Sanford with her award.

The Andrew S. Kende Professorship in Synthetic Organic Chemistry

Barbara Burger (B.S. '83), Andy Kende, President Seligman

A dinner celebrating establishment of the Andrew S. Kende Professorship in Synthetic Organic Chemistry and Professor Kende's influence in the department was held October 22, 2014 to acknowledge the lead donors to the professorship, and mark the completion of a ten year campaign led by Bob Boeckman to raise money to support a faculty position in Dr. Kende's honor. The gathering was hosted by President Joel Seligman and Professor Dolores Conway, and the program included remarks by President Seligman, Dr. Yuh-Geng Tsay (Ph.D. '77), Provost Peter Lennie, Bob Boeckman and Andrew Kende. Professor Kende also received a University medallion in honor of the professorship in his name.

During his more than half century career, Andrew Kende has made significant contributions to the science of organic chemistry in its broadest sense, as well as to the organic chemistry community. His research career began under R.B. Woodward at Harvard University, followed by an NRC-American Cancer Society Postdoctoral Fellowship with D.H.R. Barton of Glasgow (1956-57). He joined Lederle Laboratories (now Wyeth-Pearl River) in 1957 where he was involved in tetracycline synthesis.

Dr. Yuh-geng Tsay (Ph.D. '77)

In 1968, he became a Professor of Chemistry at the University of Rochester. Since that time his research program has followed two principal themes: pericyclic reactions and total synthesis. His studies in total synthesis include construction of the antineoplastic alkaloid camptothecin, the alkaloids dendrobine and sesbanine, new routes to the anthracycline antibiotics and to the tricyclic framework of the taxanes. Professor Kende's research at Rochester has involved over 50 graduate students and a similar number of postdoctoral fellows, as well as undergraduates.

Professor Kende's research led to many honors, including a 1978 Guggenheim Fellowship. His numerous invited plenary lectures include several Gordon Conference lectures, NSF Workshops in Natural Products Chemistry (1972 and 1974), the International Symposium on Anthracycline Chemistry (Winnipeg, 1978), the Royal Society of Chemistry (Cambridge, England,

article continued to next page...

July, 1983), the International Conference on Heterocyclic Chemistry (Tokyo, August, 1983), and the Medicinal Chemistry Symposium (Cambridge, England, September, 1983). In 1986, he was awarded a Japan Society for Promotion of Science Fellowship. Professor Kende also received the ACS Cope Senior Scholar Award in 2003.

Pavel Fludzinski (Ph.D. '83) and Robert DeVita (Ph.D. '89)

Laura & Elliot Richman Travel Fund

Laura and Elliot Richman are Charter Members of the George Eastman Circle. They are also very involved as Parents of Alumni, their son Daniel having graduated from the UR in 2008 with a B.S. in Physics and a B.A. in Music and Math. The Laura and Elliot Richman Student Travel Fund has been established to enable more students to attend and present their research at regional and national meetings. "I recognize from my years as a graduate student how important it is for young scientists in training to attend meetings and to meet and interact with their peers from other institutions, including the movers and shakers in their fields," Dr. Richman explains.

Elliot Richman, Ph.D., selected the University of Rochester as his undergraduate college because of the unique way in which it combined opportunities in science and music. He received his B.S. in Chemistry in 1970. After a couple of years at the University of Pennsylvania he returned to Rochester and completed his doctoral studies in synthetic organic chemistry with Professor Richard Schlessinger. He then went to Columbia University, where he was awarded an NIH Postdoctoral Fellowship, and worked on synthetic methodology and natural product synthesis in the research group of Professor Gilbert Stork.

For most of his adult life, Dr. Richman earned his living as a medical and scientific editor and writer. During that period, he also earned a Diploma in Piano Performance from the Mannes College of Music, the renowned music conservatory on Manhattan's Upper West Side. After September 11, 2001 ("911"), however, he became a high school teacher of chemistry and physics. Part of the motivation for this career transformation was to share his knowledge of, and enthusiasm for, science with young people. In 2010, he was awarded the Edward J. Merrill Award for Excellence in Teaching High School Chemistry, sponsored by the American Chemical Society North Jersey Section and the New Jersey Science Teachers Association.

Dr. Elliot Richman and his wife, Laura

Nanomaterials Symposium 2014

On Monday, May 19, 2014, the Rochester Advanced Material Program (RAMP) hosted the Nanomaterials Symposium 2014 on Frontiers in Materials Science for the 21st Century: Bioinspired Interfaces.

The symposium organizing committee members were Professors Mitch Anthamatten, Alex Shestopalov, and Lewis Rothberg, chair of RAMP. More than 100 registrants from the university, local and regional colleges, and industry attended the symposium which also featured a poster session. The event coordinator was Gina Eagan, administrator for the Materials Science program, with special thanks to Yukako Ito (`17) for the design and publication of the symposium web page and program brochure.

Nanosymposium 2014 Speakers and hosts

The day began with continental breakfast and opening comments by symposium Chair Mitch Anthamatten. The first talk of the morning, "Nano-Bio Interface Studies from Molecular Motors to Cellular Health", was given by Dr. Russel J. Composto who joined the faculty of the University of Pennsylvania in 1990 and is currently Professor of Materials Science & Engineering (MS&E). His research investigates thermodynamics, dynamics and assembly in polymer nanocomposites and nano-bio interface problems from the molecular to cellular scale.

The second seminar of the day, "Cell surface topography and the endothelial glycocalyx layer as barriers to leukocyte-endothelial adhesion" was presented by Dr. Richard E. Waugh. Professor Waugh is founding Chair of the Department of Biomedical Engineering (BME) at the University of Rochester. His research interests include biomechanics of cell membranes, cells and cell adhesion, with emphasis on underlying mechanisms of hemolytic anemia, inflammation, and microvascular perfusion. The morning program ended with the talk "Self-Healing Biomaterials" presented by Dr. William Reichert, Alan L. Kaganov Professor of BME at Duke University. He joined Duke University in 1989 and is currently the Director of the Center for Biomolecular and Tissue Engineering.

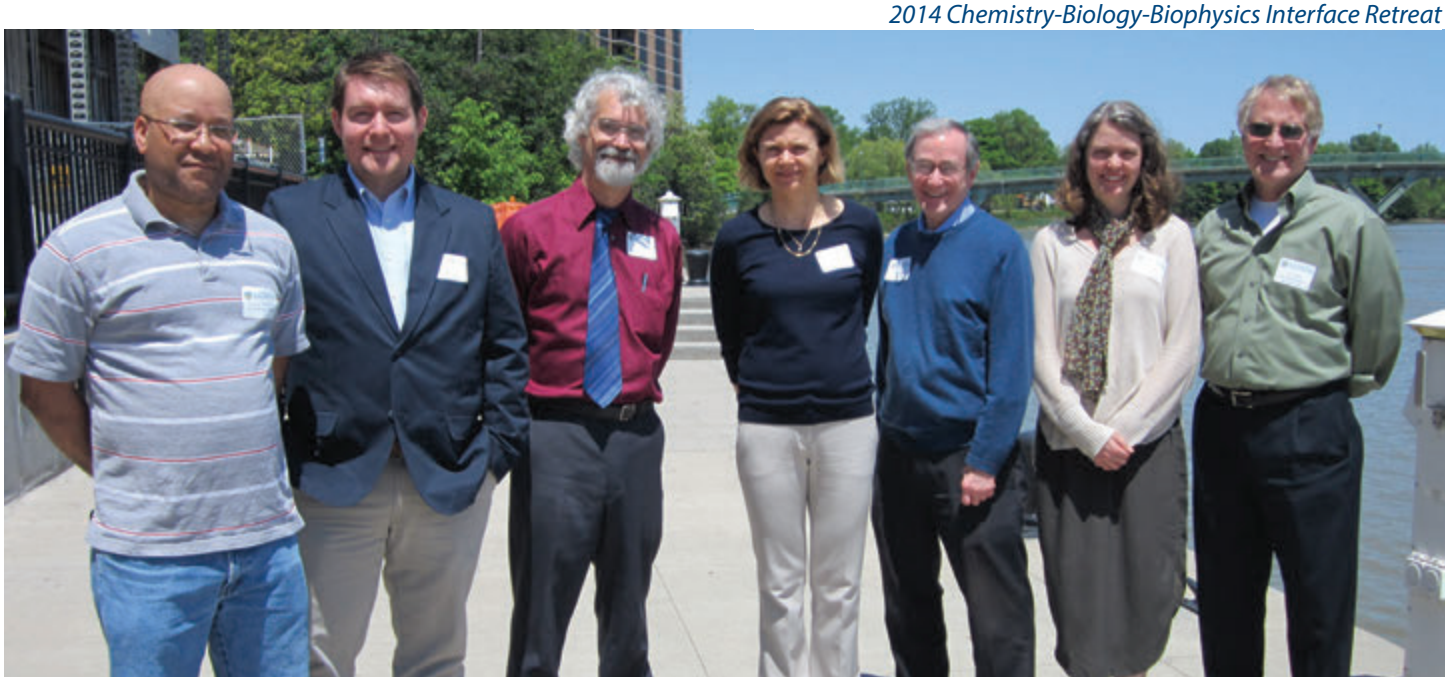
After a delicious hot buffet lunch and a lively poster session, the afternoon program kicked off with Dr. David Harding's talk on "Superomniphobic surfaces for Lab-on-Chip devices." He is a Senior Scientist at the LLE and Professor of Chemical Engineering at the University of Rochester. The next talk, "Metal-coordination: using more of nature's tricks to assemble new soft materials," was presented by Dr. Niels Holten-Andersen who received his Ph.D. from UC Santa Barbara working on characterizing the hierarchical material design of mussel holdfast fibers. He is currently the John Chipman Assistant Professor of MS&E, and the principal investigator of the Laboratory for Bio-Inspired Interfaces at MIT.

URMC Professor Lisa A. DeLouise from the Department of Dermatology gave a presentation on "Engineering Materials on the Nano and Micro Scales to Effect Cell Function." She has established a cross-disciplinary research program based on manipulating materials on the micro, nano and molecular level scales to develop novel diagnostics and therapeutic biomedical devices. Dr. William S. Oates, Professor in the Mechanical Engineering Department at the Florida A&M/Florida State University (FSU) College of Engineering, spoke next about "Photomechanical and Electromechanical Polymers for Adaptive Structure Applications."

The final speaker of the day was Mr. Jinhai Li whose presentation discussed his research on "Polyurethane-Acrylate Polymers in High-Resolution Contact Printing." Mr. Li is a Ph.D. candidate in the Department of Chemical Engineering at UR and his research is focused on the study of energy at organic-inorganic and organic-organic interfaces.

Chemistry-Biology-Biophysics Cluster Retreat 2014

2014 Chemistry-Biology-Biophysics Interface Retreat



The annual Chemistry-Biology-Biophysics Interface Retreat was held on May 29-30, 2014.

One goal of the Chemistry-Biology-Biophysics Interface Training Cluster is to increase interactions between Chemistry, Biology, Biochemistry, and Biophysics at the University of Rochester. The Cluster currently has research groups from the Departments of Chemistry, Biology, Biochemistry & Biophysics, Microbiology, Pharmacology, and Immunology. The primary medium for achieving the Cluster's goals is an annual retreat that is largely funded by the University Committee for Interdisciplinary Studies (UCIS).

The featured speaker at this year's retreat was Ken Dill, Distinguished Professor and Director of the Laufer Center for Physical & Quantitative Biology at Stony Brook University. The retreat started on the afternoon of May 29 with a talk by Prof. Dill to an audience of about 80 people in Goergen Hall. The talk was titled: "Modeling the Folding and Native Structures of Protein Molecules." Dr. Dill's talk began with a broad introduction to protein folding, with an emphasis on the interdisciplinary nature of the field. He then described his group's contributions, as well as other work being carried out at the Laufer center. Thus, his talk encompassed the retreat's theme of interdisciplinary research combining chemistry, biology, and biophysics.

The retreat reconvened at the Staybridge Suites Hotel at 9:00 AM the next day with 84 attendees. The day started with a continental breakfast, followed by a presentation titled "Untangling Solution Behavior from Structure Using Small Angle X-ray Scattering: Concentration, Separation, and Titration" by Richard Gillilan from the Cornell High Energy Synchrotron Source (CHESS). Myriam Cotten (Professor of Chemistry, Hamilton College) then presented on "Bridging Structure, Dynamics, and Function in Antimicrobial Peptides: Insights from Studying Piscidin." This was followed by a panel discussion on career directions that included Ken Dill, Richard Gillilan, and Myriam Cotten, as well as Nic Hammond, the Assistant Director of the Workshop Program at the University of Rochester.

After a buffet lunch, two postdocs and one graduate student from the Department of Chemistry gave talks on their research. Fifteen students and postdocs presented posters on their research in a lively poster session in which poster presenters interacted with students and faculty from many different departments and groups, as well as with the visiting scientists.

Much information was exchanged throughout the two days and new connections were made that can enhance research and training at the Chemistry-Biology-Biophysics Interface at UR. Several undergraduates from Myriam Cotten's group at Hamilton College were in attendance. The retreat gave all participants a broad overview of research related to biological chemistry and an appreciation of interdisciplinary approaches.

The VISTA Collaboratory in Carlson Science and Engineering Library

Demonstration of VISTA on Meliora Weekend

Dr. Brendan C. Mort, Director of CIRC

Demonstrations of the newly completed Visualization-Innovation-Science-Technology-Application (VISTA) Collaboratory were given on Meliora Weekend 2014 on the 1st floor of the Carlson Science and Engineering Library. Brendan Mort, director of the Center for Integrated Research Computing (CIRC), Jonathan Carroll-Nellenback, computational scientist for CIRC, and Will DiGrazio, assistant director of CIRC Operations, led the demonstrations that showcased how VISTA's technology will revolutionize the way "big" data can be visualized and analyzed.

Poster sessions are a staple of academia -- an effective way for students and researchers to display their projects and discuss their findings with their colleagues. Now, imagine one of those posters the size of a wall, connected to a Blue Gene/Q super computer and BlueHive 2 Linux computer cluster, so that, at the touch of a computer keyboard, multiple data sets can appear side by side, along with animated 3D representations -- of the human heart, for example, or of a complex protein strand. The VISTA Collaboratory is the new data visualization lab that will help our students, faculty and researchers better understand and analyze the reams of data now at their fingertips. As David Topham, Executive Director of the Health Sciences Center for Computational Innovation, said: "We can see relationships between data that computers cannot. But in order to do that you have to have the information in front of you so you can see the patterns and connections that matter. In other words, you need to be able to see the forest and the trees simultaneously." This is tangible evidence of our University's commitment to be at the forefront of Data Science and to ensure that our faculty and students are leaders in this field. These are exciting times indeed!

VISTA is a centerpiece of the University's commitment to becoming a leader in high performance computing and data science. The lab is part of a $30 million investment made by the University, New York State, and IBM in the Health Sciences Center for Computational Innovation (HSCCI) and more than $50 million that has been invested in recent years to expand the University's high performance computational resources.

In Memoriam

Arlene Bristol

It is with deep sadness that we note the passing of Arlene Bristol on October 13, 2013. She died of acute myeloid leukemia after entering hospice in September. Arlene is survived by her brothers David (Elaine) Rowley & Daniel Rowley; nieces; nephews & cousins and many dear friends and colleagues.

Arlene had a long and impressive history with the Chemistry Department and with ACS Publications. Arlene joined the Department in 1957 fresh out of secretarial school to work with Prof. W.A. Noyes, Jr. as journal assistant for the Journal of the American Chemical Society of which Noyes was the Editor-in-Chief. Her office was located in the Chemistry Department on the fifth floor of Lattimore Hall. After Noyes stepped down from that position, Prof. Marshall D. Gates assumed the editorship and Arlene continued in her role as journal assistant. Arlene moved to the University of Michigan in that same role when the JACS Editorship passed from Gates to Martin Stiles.

After 12 years in Ann Arbor working with the journal, and then with the organic faculty, Arlene moved to Princeton with Professor Jay Groves as the Department Administrator. She then returned to Rochester 18 months later, this time to work with Professors Rich Eisenberg, George McLendon, Bill Jones, Jack Kampmeier and Andy Kende (a truly demanding and picky lot). However, Arlene kept them all satisfied and was even able to decipher McLendon's handwriting, Kampmeier's ChemDraw structures and Kende's phone messages.

In 2001, Arlene resumed her editorial work when Rich Eisenberg took over the Editor-in-Chief role for the ACS Publication Inorganic Chemistry. Arlene became Coordinating Editor of the journal until her move to part-time status. Rich said that Arlene could accomplish more in half-a-day than most journal folks could do in a day. The department held a celebration in July 2007 to congratulate Arlene on the 50th anniversary of her professional career with the ACS. Arlene continued as journal assistant until May 2013 when she and Rich closed the Inorganic Chemistry office at Rochester, and she retired. The department celebrated her retirement with a special luncheon. She is the only ACS journal assistant to have received her first and last paychecks from ACS Publications more than 50 years apart.

In addition to her journal work, Arlene was an avid bridge player and became a gold master during her bridge career. She was a vital and vibrant member of the Rochester bridge community. Rich Eisenberg, with whom Arlene worked closely, remarked that, "Arlene was a wonderful person who made possible the extraordinary success of inorganic chemistry, the discipline, and Inorganic Chemistry, the journal, at Rochester. She will be sorely missed."

John L. Zabriskie Jr.

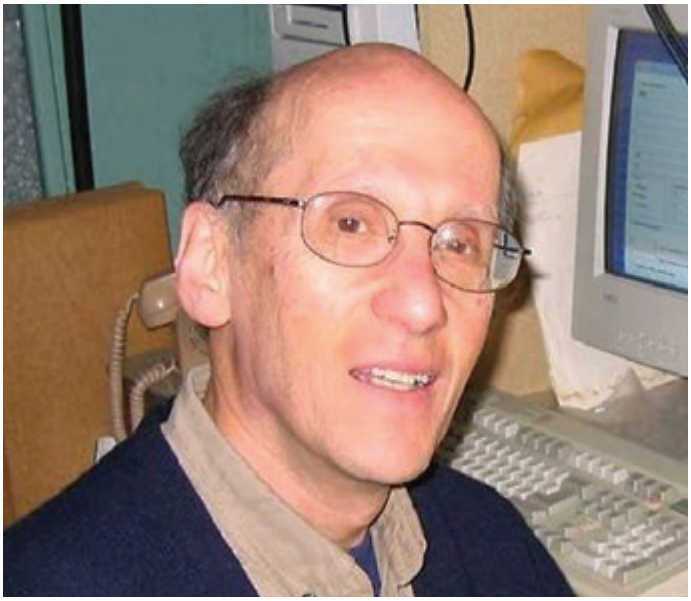
John L. Zabriskie Jr., former chairman and chief executive officer of The Upjohn Co., died March 13, 2014 at his home in Boulder, Colorado, after a bout with throat cancer. He was 74. John was born on June 8, 1939 in Auburn, New York, the descendent of Albrecht Zabriskie who settled in New Amsterdam circa 1660. Beloved husband to Adelaide Zabriskie for 40 years, John was known for being a devoted family man who enjoyed spending as much time as possible with his children, Regina Cannon, Marie Layton (Wade), Tina Constable (Rob) and Lance Zabriskie (Adrienne). Over the years, the annual family ski vacations were a great source of pleasure to him, particularly as his grandchildren were born and started skiing. He was often seen on the Snowmass trails with his grandchildren, Emma Layton, Spencer Constable, Max Cannon, Mia Layton, Tyler Constable and Zach Zabriskie in tow following his beautiful form and flawless stem christie turns. If not on the ski slopes, he could be found with Adelaide on their Colorado ranch with their horses, Fleur and Moneypenny.

John was an accomplished business executive in the pharmaceutical and biotechnology industries. He was a graduate of Deerfield Academy and Dartmouth College. He received his Ph.D. in organic chemistry from the University of Rochester in 1965 under his advisor Professor Marshall D. Gates, Jr. His thesis was entitled "'Reaction of 5-hydroxytetrahydro-exo-dicyclopentadiene with phosphoric acid."

John was Co-Founder and General Partner of Puretech Ventures and Chairman of the Board, Chief Executive Officer and President of NEN Life Science Products, Inc. At NEN, Dr. Zabriskie led the successful turnaround and sale of the company in a transaction that generated a significant return for investors. Prior to joining NEN Life, Dr. Zabriskie was President and Chief Executive Officer of Pharmacia & Upjohn Inc. As Chairman of the Board and Chief Executive Officer of Upjohn, Dr. Zabriskie led the Upjohn project, which resulted in the $12 billion merger with Pharmacia Corporation. Prior to joining Upjohn in 1994, Dr. Zabriskie spent 27 years at Merck & Co., where he began as a chemist. He held a variety of positions in quality control, manufacturing, marketing, and executive leadership including President of Merck Frosst Canada, Inc., President of Merck Sharp & Dohme, President of Merck Manufacturing Division, and Executive Vice President of Merck and Co., Inc. Dr. Zabriskie served on the Board of Directors of Kellogg Company, Array Biopharma, ARCA Biopharma, and the privately-held PureTech Ventures. In addition to his wife, children and grandchildren, John is survived by his brothers Steve Zabriskie, Stan Zabriskie, Ken Zabriskie, Eric Gronningsater and his sister Randi Stroh.

Marshall D. Gates, Jr., graduate student John L. Zabriskie and colleague, Professor Robert. L. Autry outside Lattimore Hall, circa 1965

Marty Abkowitz



Dr. Martin Abkowitz, retired from the Webster Research center of Xerox Corporation, was working as a visiting scientist in the research group of Professor Lewis Rothberg in the University of Rochester Chemistry Department. Sadly, he was killed in a freak accident as he was out for a walk in his neighborhood on January 30, 2014. Marty received his B.S. in Physics at the City College of New York in 1957, and continued his studies at Syracuse University under the direction of Professor Arnold Honig as one of his first doctoral students. After receiving his Ph.D. in Physics in 1964, Marty was an Andrew Mellon postdoctoral Fellow at the University of Pittsburgh. He started his career at Xerox in September 1965 where he worked as a Principal Scientist for 35 years until his retirement in 1999. He served as an adjunct physics professor at the University of Rochester and was also very involved as an industrial co-principal investigator at the NSF Center for Photoinduced Charge Transfer on the second floor of Hutchison Hall.

Marty made seminal contributions to the science of charge transport in disordered organic materials that laid the foundation for modern electrophotographic receptors and, more recently, OLEDs. He was a fellow of the American Physical Society, had chaired Gordon and other international research conferences, and served on several research advisory panels. Marty was a devoted music lover and was on the Board of Directors of the Society for Chamber Music in Rochester. He is survived by his wife Rollie, son David and wife Melanie, daughter Pamina and grandchildren Yonah and Talya.

IN MEMORIAM

The Department of Chemistry mourns the passing of:

Smiljko Asperger (FLW`48)

Michael James Fedele (B.A`85)

Thomas J. Hall (Ph.D.`53)

Terrell L. Hill (Faculty`46-49)

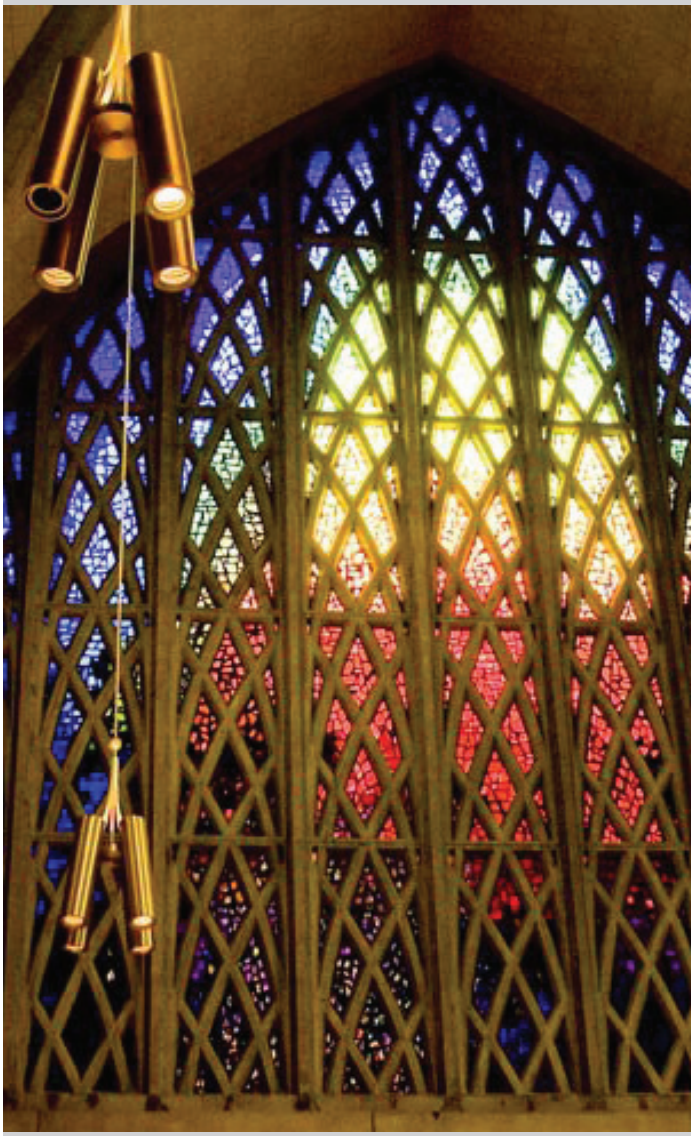
M. Patricia Kuhrt (M.S.`49)(O'Grady)

Daniel Owerbach (B.S.`48)

Rensselaer-Squire Rumney, IV (Ph.D`97)

W. Bernard Wargotz (Ph.D`55)

Akimichi Yokozeki (FLW`80)



Student Awards and Accolades

Michael Robo, parents, and Dan Weix

This year's John McCreary Memorial Prize winner, **MICHAEL ROBO (B.S. '14)**, is pictured with Professor Daniel Weix and his parents. This prize was established in 1985 in tribute to the high academic and scientific standards and the personal dedication of John James McCreary, who received his B.S. degree in Chemistry in 1975. Michael, who worked in the Weix lab for two years, graduated with the chemistry department's highest distinction honors, and has started graduate studies in chemistry at the University of Michigan-Ann Arbor.

Louis Papa and Rudi Fasan

LOUIS PAPA (B.S. '14) was selected to receive the Dr. E.W. and Maude James Award which recognizes outstanding performance and promise in chemistry. This award was established in 1982 as an endowed fund by Dr. John J. Flagg to recognize outstanding performance and promise in chemistry by a graduating senior. Louis did undergraduate research with Rudi Fasan and will be attending Massachusetts Institute of Technology to pursue a Ph.D. in Chemistry. After two years of participating in research in the Jones lab, **JAMES SHANAHAN (B.S. '14)** won the ACS Inorganic Chemistry Award, and will begin graduate studies at the University of Michigan. **RYAN RIBSON (B.S. '14)** will bring his ACS Organic Chemistry Award with him when he moves out west to start the Ph.D. program in Chemistry at the California Institute of Technology. **PETER KRASNIAK (B.S. '14)** was the recipient of the ACS Rochester Section Award, given to a senior with an outstanding academic record. He was recognized during the ACS Annual Rochester Section Undergraduate Research Symposium and his name is now displayed on a plaque in the department. Peter is moving across the street as he prepares for a career in medicine at URMC. All four of these young men were also recipients of the Carl A. Whiteman, Jr. Teaching Award for exemplary teaching by an undergraduate and members of Phi Beta Kappa.

Chemistry Department awards went to **JOSHUA GEIGER (B.A. '14), ZACHARIAH HALE (B.A. '14), GREGORY MCKAY (B.A. '14), PHILIP SUTERA (B.S. '14)**, and **RACHEL HEE YOUNG PARK (B.A. '14).** These awards are given to seniors in recognition of outstanding scholarship in the study of chemistry.

Rachel Hee Young Park and Family

RACHEL HEE YOUNG PARK (B.A. '14) also received the Janet Howell Clark Prize. Established by the University, this award is given to the senior woman who has shown the greatest promise in creative work in one of the following fields - Physics, Chemistry, Biology, or Astronomy - and has shown outstanding versatility in the mastery of allied fields. Rachel graduates with highest distinction chemistry honors and was elected to

Peter Krasniak with Todd Krauss

Phi Beta Kappa. As a junior, Rachel was also the recipient of the Catherine Block Memorial Fund Prize. Rachel will be staying in Rochester as she continues her education as a medical student at URMC.

This year's recipient of the Catherine Block Memorial Fund Prize is **CHITAVI MAULLOO**. This University award is given to a woman in the Junior class in recognition of her outstanding ability and achievement in the field of science.

The department gave four W.D. Walters Teaching Awards this year: **KEITH HILFERDING (M.S.'14), KIERRA HUIHUI (M.S.'14), BRIAN SHELDON**, and **PETER THAYER**. This award, memorializing the late Professor Walters, recognizes outstanding undergraduate teaching by graduate teaching assistants and their commitment and achievements.

Three graduate students were recipients of the Robert and Marian Flaherty DeRight Fellowship established in 1984 by Mrs. DeRight as a tribute to her husband Robert (B.S.'31). The fellowship will provide **JOSHUA KOLEV (M.S.'12), TIAN JIANG (M.S.'11)**, and **WATHSALA G.H.M. LIYANAGE (M.S.'11)** graduate support for one year.

DANIEL EVERSON (Ph.D. '13) won the University of Rochester Natural Science Outstanding Dissertation Award in the Natural Sciences for 2013-2014 for his thesis entitled "Nickel-Catalyzed Electrophile Cross-Coupling of Aryl Halides." This award is a testament to his exceptional work as a graduate student with Professor Dan Weix. Dan is currently a visiting assistant professor at St. Olaf College, Northfield, MN near his hometown of Minneapolis.

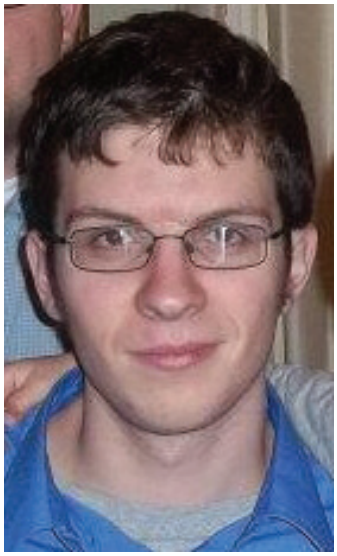
Five Chemistry graduate students were selected to receive Elon Huntington Hooker Fellowships which are

Ryan Ribson, family, and Dan Weix

supported by a gift from the wife of Elon H. Hooker, a graduate and Trustee of the University, and founder of the Hooker Electrochemical Company. The recipients are **PETER CARLSEN (M.S.'11), NICOLE COGAN (M.S.'11), JOHN FROST (M.S.'11), YUNZHE JIAO (M.S.'11)**, and **DOUGLAS TUSCH (M.S.'12)** .

The purpose of the Arnold Weissberger Fellowship in Chemistry is to reward and encourage outstanding research achievement and the potential for continued growth. This year's deserving recipients are **KYLE BIEGASIEWICZ (M.S.'12), YEKATERINA LYUBARSKSAYA (M.S.'11)**, and **ALEXANDER WOTAL (M.S.'12)**. Each fellow receives additional financial support and the funds to travel to a major scientific meeting to report the results of his or her research.

DAVID CONDON (M.S.'11), a graduate student in the Turner group, was selected to receive the Moses Passer Fellowship which was established in 2009 by Mrs. Dorothy Rosenberg-Passer in memory of her husband. Dr. Moses Passer received his BS degree in Chemistry from the University of Rochester in 1945 and his Ph.D. in Organic Chemistry from Cornell in 1948. After a distinguished career as a professor at the University of Minnesota in Duluth, Dr. Passer served as director of Education



at the ACS for more than two decades. Dave was co-author on a recently published paper reporting results on Locked Nucleic Acid (LNA) tetramer, CAAU, and is now writing a paper that includes results for the RNA tetramer, CAAU.

Six outstanding graduate students were recipients of the Samuel A. & Ellen F. Lattimore Fellowship which was established to honor Professor Lattimore who was associated with the University of Rochester for more than 40 years and was Chair of the Department of Chemistry from 1867 to 1908. The fellowship winners are **AMANDA AMORI (M.S.'14), STEPHANIE DAIFUKU (M.S.'13), KATHLYN FILLMAN (M.S.'14), BANU KANDEMIR (M.S.'13), DANIELLE RAYMOND (M.S.'14)**, and **DAN WU (M.S.'14)**.

Jennifer Urban with Todd Krauss

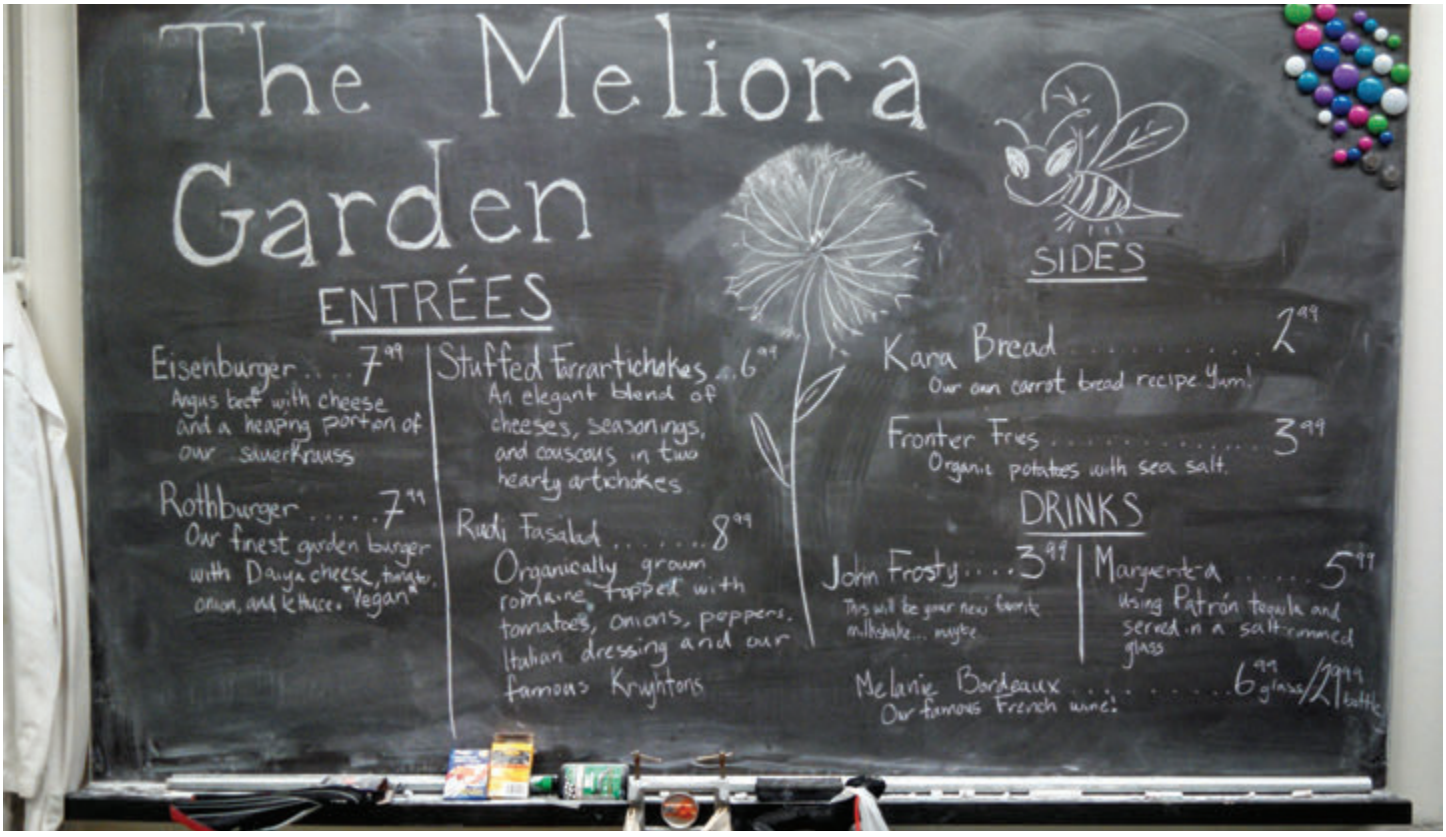
James Shanahan and Bill Jones

Doctoral degree student **JENNIFER URBAN (M.S. '14)**, a member of the Krauss group, was nominated by the Chemistry faculty and selected by the University Dean of Graduate Studies to receive the prestigious Robert L. and Mary L. Sproull Fellowship. Jennifer's research focuses on pairing semiconductor quantum dots, which possess size-tuneable optical and electronic properties, with peptide hydrogels, and studying their combined properties.

ZHIJI HAN (Ph.D. '14) was the recipient of the Agnes M. and George Messersmith Fellowship in recognition of his outstanding work in the Eisenberg group. Zhiji is a co-author on several published papers regarding the photocatalytic reduction of hydrogen in aqueous solutions and is currently a postdoctoral fellow at Caltech in the research laboratory of Professor Theo Agapie.

Research Experience for Undergraduates (REU) Students

2014 REU students after lunch at High Falls on May 28th – UR undergrads Matthew Carbone, Danielle Barnett, Katherine Grasso, Jonathan Boualavong, Sagar Patel, and Andew Olsen. (Taken by Tom Krugh, REU advisor.)



Four REU students were doing some brainstorming, and they came up with a menu for a Chemistry Department restaurant called "The Meliora Garden." They must have been hungry at the time. The menu included the following items: the Eisenburger with sauerKrauss, the Rothburger, Stuffed Farrartichokes, a Rudi Fasalad with Krughtons, Kara Bread and Frontier Fries. Specialty drinks included the John Frosty, a Marguerita, and the house red wine Melanie Bordeaux. The four REU students who came up with the menu were John Decourcey, Garrick Centola, Katherine Grasso, and Qi Ying (Queenie) Li.

Faculty News

Robert K. Boeckman, Jr.

Marshall D. Gates, Jr. Professor of Chemistry

Ph.D. 1971, Brandeis University

RESEARCH INTERESTS

Total synthesis of alkaloids, terpenes, antibiotics, and antitumor agents; development of new synthetic methodology including the asymmetric synthesis methods involving the Diels-Alder reaction, the Claisen-retro-Claisen and other reactions; applications of conformational theory to the development of stereocontrolled organic reactions.

CONTACT

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During the 2013-2014 academic year **ROBERT K. BOECKMAN, JR.** was on sabbatical following completion of his term as Chair of the Chemistry Department. He spent three months lecturing in Europe; one month as a visiting professor at the ESPCI in Paris with Janine Cossy, and two months at the RWTH-Aachen in Aachen Germany where he was supported by an Alexander Von Humboldt Research Award. Bob continues his duties as associate editor of the Journal of Organic Chemistry, and President and Chair of the Board of Directors of Organic Syntheses, Inc.

Bob Boeckman's research group continues their efforts directed toward the development of new synthetic methodology and the application of that methodology to problems of current interest in complex molecule synthesis, particularly molecules possessing important biological activity. Significant progress has been made in the past year toward the synthesis of FK-506, as well as projects directed toward Apoptolidin. New aza-[3,3]-sigmatropic rearrangement methodology has been developed, which has now been published, and attention is now focused on application of this chemistry to the antitumor Manzamine class alkaloid Nakadomarin A. Work is continuing toward an asymmetric variant of a shelf-stable chromium(III) complex that serves as a precatalyst for Nozaki-Hiyama and Takai type chromium-mediated allylations of aldehydes and for a wide variety of chromium(II) mediated reactions, and additionally on asymmetric vinylogous Mukaiyama aldol reactions catalyzed by chiral oxazaborolidines. The group has also completed their first efforts in organocatalysis with the development of catalytic systems for hydroxymethylation of aldehydes. Studies in this area are continuing toward asymmetric oxidation of aldehydes and other applications. New collaborative projects have been initiated with Professors David Goldfarb of the Biology Department and Damian Krysan of the Department of Pediatrics, URMC, whose goals are 1) the identification of the biological target(s) of a novel series of small molecules which mimic the effects of caloric restriction on lifespan in

Hutchison Hall

yeast and in small mammals, and 2) the development of inhibitors showing specificity for fungal enzymes for use in antifungal therapy against invasive fungal infections of neonatals and young infants.

GREG FRATTINI (Ph.D. '10) moved on to a postdoctoral position at the UC Irvine. **GEORGE ARAB (Ph.D. '13)** defended his thesis in June and joined the group of Dean Toste at UC Berkeley as a Post Doctoral Associate in November 2013. **MATT BETUSH (M.S. '08)** will defend his thesis in Spring 2015, and as of August 15, 2013 joined the faculty of Allegheny College as a Temporary Visiting Assistant Professor. Part-time scientist Dr. Dennis Savage, retired from Kodak, continues his work in the group on several projects with the Krysan groups (Pediatrics URMC). **SARAH PAULSON (M.S. '11)** and **HUI WANG (M.S. '11)** are completing their fifth year and will be graduating this Spring. Sarah is working on CBS catalyzed enantioselective Mukaiyama aldol reactions, and Hui on the total synthesis of Nakadomarin A. Fourth year students **DOUGLAS TUSCH (M.S. '12)** and **KYLE BIEGASIEWICZ (M.S. '12)** have completed their doctoral requirements and are focused solely on research. Doug has taken over the Apoptolidin project from Brian Ohman, with assistance of third year student **LIFENG XIAO (M.S. '14)**, and Kyle Biegasiewicz has taken on FK-506. **GILBERT REYNDERS (M.S. '13)** (Lake Forest College) left the group in December 2013 and is pursuing a Ph.D. degree at the University of Iowa in Biological Chemistry. Kyle Rugg (RIT BS/MS) and Heidi Schlager joined the group in January 2014. Kyle Rugg is working on Nakadomarin A and, with the assistance of Heidi Schlager, continuing on with Matt Betush's work on catalysis including asymmetric versions using Chromium(II) and Copper (I). **TODD R. RYDER (Ph.D. '05)**, after spending last year as a visiting Assistant Professor at Quinnipiac University in Connecticut, has taken a tenure-track appointment as Assistant Professor of Chemistry at Southern Connecticut State University. **CHARLES H. (CHUCK) WEIDNER (Ph.D. '90)**, after spending many years at Eastman Kodak and in other industrial research positions, is now a member of the chemistry faculty of Pima Community College in Pima, AZ.

Snow falls on the Flagpole on the Eastman Quad (J. Adam Fenster)

Kara L. Bren

Professor of Chemistry

Ph.D. 1996, California Institute of Technology

RESEARCH INTERESTS

Bioinorganic and biophysical chemistry: engineered metalloprotein and metallopeptide catalysis for solar fuels, biological and nanotechnological systems for solar energy conversion, heme protein structure and function, protein dynamics.

CONTACT

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The **KARA BREN** group has continued to develop its biochemistry-based approach to solar fuels while also furthering its spectroscopic investigations of heme protein electronic structure and dynamics. First-year graduate students Brian Sheldon and Saikat Chakraborty joined the group's efforts in solar energy conversion. Brian will be focusing on developing metallopeptide-based electrocatalysts, and Saikat will be engineering light-activated artificial hydrogenases. Third-year student **BANU KANDEMIR (M.S. '13)** is focusing her efforts on engineering protein-based electrocatalysts for hydrogen evolution and has new exciting results demonstrating that a thermophilic protein matrix significantly stabilizes the catalytic site. Third-year student **REBECCA SMITH (M.S. '13)** also has joined the solar energy conversion studies by working with postdoc **SANELA LAMPA-PASTIRK** on developing novel biological electron donors in solar fuel-generating systems. Rebecca also is developing manganese-substituted cytochromes as MRI contrast agents in collaboration with Xiao-an Zhang (Toronto). The group also wishes the best to this year's graduates. **BENJAMIN DICK (B.S. '13, M.S. '14)** completed his Master's degree and moved on to commence Ph.D. studies at the University of California at San Diego. **KRISTEN BENTLEY (B.S. '14), SARAH KONISKI (B.S. '14),** and **ANTHONY PASCHKE (B.S. '14)** also graduated this year. Kristen will be attending graduate school starting January 2015, Sarah is seeking employment, and Anthony is undergoing pilot training for the U.S. Navy.

The past year saw a lot of changes and much travel for Kara, who welcomed new sources of funding for her energy conversion work and also had a semester-long sabbatical to further those efforts. As part of her sabbatical, she spent January – April 2014 as a Visiting Professor at Lund University, Sweden. Although her colleagues joked that she is the only person who would go somewhere darker than Rochester for a sabbatical, she enjoyed winter in Lund, which is a beautiful small city only 45 minutes by train from Copenhagen. While in Lund, Kara worked with Prof. Lars Hederstedt to learn how to culture and engineer Gram-positive bacteria. Kara and Lars also organized a Workshop on Bacterial Electrochemistry to which they welcomed experts from a number of labs in Europe. While based in Lund, Kara also gave talks and visited collaborators at the University of Girona (Spain), Palacky University (Czech Republic), and the University of Oslo (Norway). Summer 2014 has seen more travel as Kara gave talks at the International Conference on Porphyrins and Phthalocyanines in Istanbul, Turkey, and at the conference on Global Artificial Photosynthesis in Chicheley, England. Banu Kandemir joined Kara in Istanbul and presented a very well received poster on her hydrogen-generation catalysts.

The Bren Group

Starting in January 2014, Kara took on a new role as an Associate Editor for the Journal of the American Chemical Society. She is enjoying this new challenge and appreciates how her Editorial Assistant Valerie Drake keeps the operation running smoothly.

Esther M. Conwell

Research Professor

Ph.D. 1948, University of Chicago

RESEARCH INTERESTS

Transport along the base stack in DNA; proton transfer in DNA; electrical and optical properties of organic semiconductors, particularly conjugated polymers.

CONTACT

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ESTHER CONWELL: An adenine-thymine pair has 2 hydrogen bonds connecting the adenine (A) and thymine (T), each one containing a proton. If the pair is uncharged, one proton occupies a site close to N6 on A and the other occupies a site close to N3 on T. If a hole is added to the adenine, its positive charge repels one of the protons, which then moves from being close to N6 on A to being close to O4 on T. This proton transfer has been much studied. In one of our previous papers we simulated the transfer and found that it took about 50fs. We decided to investigate whether adding an electric field parallel to the hydrogen bonds, in the direction that would presumably accelerate the proton, would decrease the time taken for the transfer. We set up a "computer experiment" to measure the transfer time as a function of the magnitude of the electric field. We found that, with or without the field, the proton motion varies erratically with time. This suggests that the interaction of the proton with its surroundings, including the water molecules, causes scattering of the proton. Another finding we made was that proton transfer did not occur at all at very high electric fields. Within the field range where transfer occurred it was found that, for not too high fields, the proton speed increased with increasing field, as expected. However, further increase in field caused the proton speed to decrease, and finally the point was reached where the proton did not move in the field at all.

In our work on this project last year we found that applying the high electric field caused the water temperature to increase rapidly. Studies of the ionization of water in very high fields have shown that the water dissociates partly into protonated water clusters. Due to its charge, such a cluster could be accelerated by the high field, causing stronger scattering of the protons. We suggest that this is the reason the protons are less accelerated in the very high fields.

The fact that at the highest fields no proton transfer was seen at all can be attributed to a change in bonding caused by the field. Specifically, examination of the wavefunction of the hole at the highest fields shows that the bond between the proton and O4 is destroyed.

The work described above, with coauthors **DAVID STELTER** and **SAURAV SHARMA**, seniors at the time the work was done, and **BRENDAN MORT**, Director of the Center for Research Computing (CIRC), has been submitted for publication. A short paper entitled "The Role of Hole Traps in DNA" by E. Conwell has been accepted for publication in the Journal of Physical Chemistry & Biophysics. This paper shows that the work of Renaud, Berlin, Lewis and Ratner, *J. Am. Chem. Soc.* **2013**, 135, 3953-3963, which contends that hole conduction in DNA of length 5 to 10 base pairs is due to a mechanism in which the hole is spread over the full length of the DNA rather than localized to a single base pair, is incorrect. The reason for this discrepancy is that it is based on the incorrect assumption that the time required for solvent reorganization is long compared to the transit time of the hole across this short DNA.

Joseph P. Dinnocenzo

Professor of Chemistry

Ph.D. 1983, Cornell University

RESEARCH INTERESTS

Chemistry of organic ion radicals; mechanistic and physical organic chemistry.

CONTACT

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JOE DINNOCENZO and his group continue to pursue a variety of problems in electron transfer and related chemistry. In collaboration with Samir Farid, former postdoc Deepak Shukla (Eastman Kodak), and Dr. Shashi Adiga (also at Kodak), we recently investigated the chain amplified photochemical fragmentation of N-alkoxypyridinium cations in the presence of pyridine bases. As part of this work we discovered a novel reaction between alkoxyl radicals and pyridine bases in which a hydrogen atom is transferred from the alkoxyl radical to the pyridine base. Quantum chemical calculations indicated a proton coupled electron transfer mechanism for this unusual hydrogen atom transfer. Graduate student **ADAM FEINBERG (M.S. '13)** has recently used nanosecond transient absorption spectroscopy to find direct experimental evidence for the chemistry. Adam is also working to understand the general mechanism for fragmentation of aryltrialkyl Group 14 cation radicals. Adam has discovered that, like aryltrimethylstannane cation radicals (previously investigated in the group by **PU LUO (Ph.D. '12)**), aryltrimethyl silane and germane cation radicals undergo fragmentation to preferentially give the less stable aryl radical rather than a methyl radical. Adam is currently working to fully understand the mechanism of these reactions. Adam also completely rewrote our computer programs to control new excimer and dye lasers that we installed on the group's nanosecond transient absorption apparatus over the past year. Joe presented several talks on the group's research at colleges and universities over the past year, including a plenary lecture at the International Conference on Hydrogen Atom Transfer (iCHAT 2014) in Italy.

Joe is continuing to work with doctoral student **TERRELL SAMORISKI** on a pedagogical research project involving the design, implementation, and evaluation of the Peer Led Team Learning (aka Workshops) model for CHM210 (Honors Organic Laboratory II). Along with other findings, Terrell's research has shown that students find Workshops help them to be better prepared for lab and assists them with their data analysis – two perennial problems experienced in laboratory courses.

The numerous flags in Hirst Lounge (Wilson Commons)

Richard Eisenberg

Professor of Chemistry / Research Professor — Ph.D. 1967, Columbia University

RESEARCH INTERESTS

Inorganic and organometallic chemistry; artificial photosynthesis and light-to-chemical energy conversion; complexes of the platinum group elements (PGE's) and gold; homogeneous catalysis; photochemistry and photophysical properties of metal complexes; oxidative addition and bond activation chemistry; use of luminescent complexes in light emitting diodes; parahydrogen induced NMR effects in hydrogen addition reactions.

CONTACT

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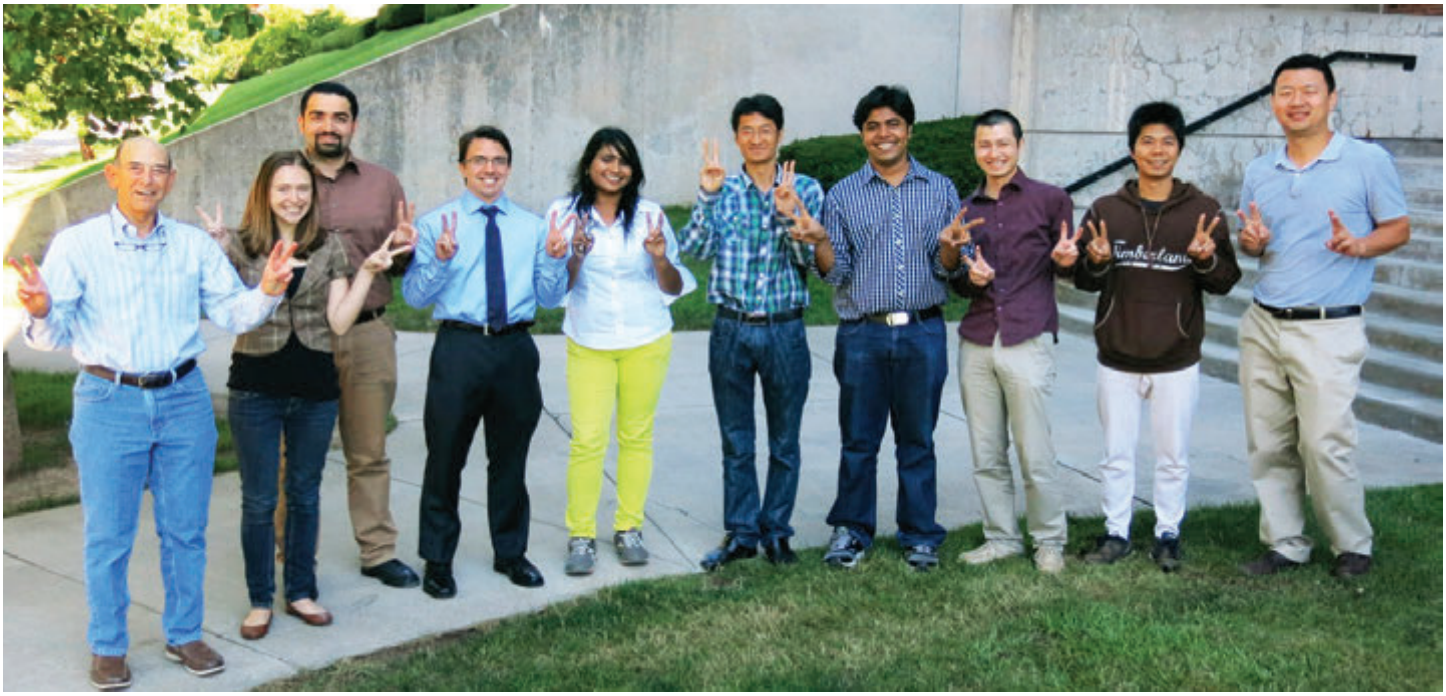
The **EISENBERG** group continues to make great progress in designing, developing and analyzing new systems for the photogeneration of H_2 from water. This reaction is the reductive side of splitting water into its constituent elements and is the key reaction for light-to-chemical energy conversion in artificial photosynthesis. Following the success of the recent achievement of a highly active and durable system for hydrogen generation using CdSe quantum dots as light absorbers (done in collaboration with Pat Holland and Todd Krauss and published in Science), the group realized the importance of dissociation of water-solubilizing capping agents from the quantum dots. Postdoc **AMIT DAS** and visiting graduate student **MOHSEN HAGHIGHI** then synthesized new capping agents inert to substitution, and together with graduate student **ZHIJI HAN (Ph.D.'14)**, they found a system that allowed assessment of different molecular catalysts for H_2 generation. In the process, Das and Han examined new molecular catalysts based on Ni complexes of redox-active ligands, a favorite subject of Rich's from years past.

Another new direction has been initiated by postdoc **PURNIMA RUBERU** and visiting faculty member **YUMING DONG** to carry out proton reduction at a photo-cathode in order to eliminate the need for a chemical source of electrons to make H_2. First studies on this subject will be published in the coming year. Graduate student **RANDY SABATINI (M.S. '11),** who is co-advised with Dave McCamant, has also made significant progress in looking at ultra-fast processes involving dye sensitizers attached to TiO_2 for H_2 generation. This research is supported by the NSF in a collaborative project with University at Buffalo scientists. Finally, both postdoc **BO ZHENG** and Masters student **TROY (LIDONG) WANG (B.S. '13, M.S. '14)** have synthesized new platinum charge transfer complexes with organic dyes attached that will be investigated for photoinduced charge transfer into semiconductors for proton reduction.

 Reception of Oesper Award



While travels for Rich continued as usual to ACS Meetings, Gordon Conferences, the annual DOE Solar Photochemistry Meeting and universities for lectures, two highlights deserve special mention. In October, Rich received the Oesper Award from the Cincinnati Section of the ACS and delivered his address as part of the Oesper Symposium that featured Harry Gray, **CLIFF KUBIAK (Ph.D. '80)**, Jim Mayer, Dan Nocera, Vivian Yam and Marcetta Darensbourg in addition to Rich. The event, which was truly special, was organized and coordinated by University of Cincinnati Professor (and former post-doc) **BILL CONNICK**. The Eisenberg group took a road trip to attend the festivities and enjoy the outstanding selection of speakers. A great time was had by all!

The second travel highlight took place in Washington, D.C. at the end of April. Rich first attended a meeting of the Board of Chemical Sciences and Technology (BCST), the annual meeting of the National Academy of Sciences and a board meeting of the Proceedings of the National Academy of Sciences. But what really set this trip apart from others was Rich's visit to the classes of granddaughters Michayla (2nd grade) and Isabella (pre-school) to do chemistry. Decked out in a tie-dye labcoat, Rich did experiments with dry ice, liquid nitrogen, acid-base indicators and chemiluminescence to name a few. The kids enjoyed the experiments and the second graders wrote letters proclaiming "I love science", "I love chemistry" and "I want to be a chemist." The most positive compliment came from one boy who asked Rich if he could do his birthday party - a potentially new career!

Rich's Granddaughters, Michayla and Isabella

Group comings and goings during the past year include the arrivals of postdoctorals Bo Zheng and Purnima Ruberu, the graduation of **ZHIJI HAN (Ph.D. '14),** who assumed a postdoctoral position at Caltech, and the departures of post-doc **WILL ECKENHOFF** who joined the faculty at Hobart and William Smith Colleges (while enjoying the thrills of being a new father to son Wyatt), visiting graduate student Mohsen Haghighi who has returned to his home university in Shiraz, Iran, and Dr. Yuming Dong, a visiting faculty member from Jiangnan University in China. Also, as part of a 5-year Bachelors-Masters program, **TROY (LIDONG) WANG** completed his M.S. degree and is no longer with our group.

Samir Farid

Research Professor

Ph.D. 1967, Göttingen University

RESEARCH INTERESTS

Mechanisms and kinetics of photoinduced electron transfer reactions; fundamental aspects of ion pair dynamics and the kinetics of radiative and nonradiative electron transfer processes.

CONTACT

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SAMIR FARID's research continues to be on the photochemistry and photophysics of electron transfer processes. The main emphasis this year was on the effect of strong mixing on exciplex emissions. Exciplexes – mixed charge-transfer (CT, A•–D•+) and locally excited (LE, A*D) states – have long been recognized by broad, structureless fluorescence. In collaboration with Ralph Young and Joe Dinnocenzo, we investigated a series of exciplexes in which the energy gap between the pure CT and LE states was systematically varied over a wide range. As the gap narrows, structural features start to appear and become more pronounced when the energy of the pure CT state exceeds that of the LE. Identifying the vibrationally structured emissions as exciplexes is supported by transient kinetic measurements by Joe Dinnocenzo using a newly acquired single photon counting instrument. Ralph Young developed a theoretical model to simulate the spectra and reproduces the experimentally determined radiative rate constants. A wealth of information is gleaned from the fitting procedure that could not have been obtained only from the broadband exciplexes such as reorganization energies and electronic coupling constants. Collaborating with such wonderful colleagues is the most rewarding part of my studies.

Wilson Blvd. Pear Trees (J. Adam Fenster)

James M. Farrar

Professor of Chemistry

Ph.D. 1974, University of Chicago

RESEARCH INTERESTS

Dynamical studies of low energy ion-molecule reactions in the gas phase; imaging studies of collisions; photochemistry of size-selected ionic clusters.

CONTACT

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Imaging ion-molecule reactions continues as the theme for **JIM FARRAR** and his research group. Over the past year, our work has focused not only on reactions of importance in astrochemistry – hence our reputation for being "Lost in Space" – but also on ionic processes in the Earth's stratosphere and ionosphere, including a study of reactive processes of atmospheric ions with anthropogenic methyl halides.

The international flavor of the group continues to develop. Last year, Professor Stefano Falcinelli and his family from the University of Perugia spent the summer in Rochester. They were joined by colleague Professor Franco Vecchiocattivi and his wife Loretta for a week at the end of the summer. This year the group has been pleased to welcome summer visitor **EDUARDO CARRASCOSA**, a native of Madrid, who is studying for his Ph.D. degree in the research group of Professor Roland Wester at the Institute for Ion Physics of the University of Innsbruck. These visits have led to the development of new directions in the group: Stefano designed a pyrolysis source for producing free radicals, and that source is now in operation in the lab. Eduardo's expertise with velocity map imaging has helped undergraduate student Nan Yang design and build an improved optical system for imaging reaction products. The forty-year long collaboration with the Molecular Beam group in Perugia will continue this Fall as Jim travels with the group to the "Elletre" synchrotron light source in Trieste for a series of experiments on multiply-charged molecular cations.

Postdoc **LINSEN PEI** has continued working toward a comprehensive program of study on the reactions of ions and free radicals. This has turned out to be a challenge, but with Stefano's "afterburner" pyrolysis source, Linsen and Eduardo have made the experiment work, and we have begun to delve into the mysteries of ion-radical reactions. Our first studies have been on the dynamics of charge transfer and proton transfer reactions of the methyl radical. Happily, our National Science Foundation grant for these studies was renewed for three years in 2013.

Jim continues to work with the Kearns Center for Leadership and Diversity in Arts, Sciences and Engineering to provide academic assistance to minority students interested in pursuing careers in science. The successful study group program that many dedicated graduate students in chemistry have staffed will serve as a model for a similar effort for students in introductory biology courses to be initiated in the Fall 2014. The Center is in the final year of an NSF S-STEM grant for $598,000, for which Jim serves as PI along with Beth Olivares from the Center, to provide academic and financial assistance to STEM (Science, Technology, Engineering, Mathematics) students coming from underrepresented groups.

Jim and Kathy continue to enjoy their role as grandparents, "the best gig in the world", as Jim likes to say! Grandsons Callum and Cary live in Manhattan with parents Stacey and Achim, and granddaughter Josefina ("Fi Fi") and her parents Mariana and Andy will move to Amherst, Massachusetts this summer, as Mari begins a faculty position in Neuroscience at the University of Massachusetts.

Jim's Grandchildren, Callum, Cary, Fi Fi

Rudi Fasan

Associate Professor of Chemistry

Ph.D. 2005, University of Zürich, Switzerland

RESEARCH INTERESTS

Bioorganic chemistry and chemical biology; Synthesis and directed evolution of macrocyclic peptides and organo-peptide hybrids for molecular recognition and catalysis; Protein-protein interactions; P450 engineering and chemo-enzymatic C-H functionalization.

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Prof. **RUDI FASAN** and his group continue to be engaged in the development and investigation of novel chemobiosynthetic methodologies for the synthesis and evolution of peptide-based macrocycles to modulate protein-protein interactions and of P450-based methodologies for selective C(sp3)-H functionalization. Over the past year, the peptide macrocycle subgroup has reported a number of important achievements. Graduate student **JESSICA SMITH (Ph.D. '14)**, with the help of UR undergraduates Nicholas Hill and **PETER KRASNIAK (B.S. '14)**, developed an efficient method for obtaining bicyclic organo-peptide hybrids via coupling our previously developed MOrPH cyclization strategy with late-stage disulfide bridge formation (*Org. Biomol. Chem.* 2014). In a final rush toward her Ph.D. degree, Jessica also completed an initial study on designer macrocycles targeting the oncoproteins Hdm2/X, providing a first demonstration that MOrPH-based scaffolds can accommodate alpha-helical protein-recognition motifs (*Chem. Comm.* 2014). After overcoming a number of technical challenges, fifth year graduate student John Frost, assisted by UR undergraduate **LOUIS PAPA (B.S.'14)**, finally brought to completion a project focused on implementing a method for the ribosomal synthesis of cyclopeptides in bacterial cells. A complementary methodology for enabling the spontaneous, post-translational formation of cyclic peptides constrained by a thioether bond in living cells was established by postdoctoral fellow Nina Bionda and **ABBY CRYAN (M.S.'14)**, resulting in a publication that will soon appear in ACS Chemical Biology. In January, Abby earned her Master's degree and moved on to take a position in industry. A few months later, Jessica successfully defended her PhD thesis and over the summer will move to Cornell University as a postdoctoral fellow in the lab of Chemical Engineering Professor Matthew DeLisa. As we bid them a fond farewell, we have welcomed this year the arrival of first-year graduate student Andrew Owens, who is currently working on implementing a high-throughput platform for the functional selection of these macrocyclic molecules.

Important research accomplishments have also been made by the subgroup working on P450-mediated C-H functionalization. In a study conducted by **JOSHUA KOLEV (M.S.'12)** (fourth-year graduate student), we

The Fasan Group

developed selective P450 catalysts for the late-stage chemoenzymatic functionalization of the sesquiterpene lactone parthenolide, leading to the discovery of derivatives with improved antileukemic activity (*ACS Chem. Biol.* 2014). With support from the Leukemia and Lymphoma Society, a new postdoc, **VIKAS TYAGI**, and Josh are currently working on improving the pharmacological potency and drug-like properties of these compounds. Josh has also recently completed a study on the effect of unnatural mutagenesis on P450 catalytic properties *(Chembiochem*, 2014). Interestingly, we discovered that certain unnatural amino acids, when inserted into the heme cavity of P450s, have the peculiar ability to dramatically affect either the site-selectivity or the catalytic efficiency of these enzymes. Postdocs **RITESH SINGH** and **MELANIE BORDEAUX** made the first inroads toward exploring the potential of cytochrome P450s as C-H amination catalysts. In a first paper, which has received a number of highlights, they demonstrated that engineered P450 variants can efficiently catalyze the cyclization of arylsulfonyl azides via an intramolecular nitrene C-H insertion reaction (*ACS Catalysis*, 2014). In follow-up work, they showed that engineered and artificial myoglobin-based catalysts can also exhibit this reactivity (*Bioorg. Med. Chem.*, 2014). With the help of visiting scientist **DR. GOPEEKRISHNAN SREENILAYAM**, we are currently exploring the scope of these catalysts in the context of other nitrene and carbene transfer reactions. I anticipate these efforts will lead to a series of interesting papers over the next few months, so stay tuned!

Three talented undergraduates have completed their Senior Thesis Research in our lab this past year and graduated in May among a number of accolades in recognition of their research and academic accomplishments. These are **LOUIS PAPA (B.S. '14)**, who will join the Chemistry Ph.D. program at MIT, **PETER KRASNIAK (B.S. '14)**, and **PHILIP SUTERA (B.S. '14)**, who will join the MD program at the Schools of Medicine of the University of Rochester and University of Pittsburgh, respectively. We also wish best of luck to other former students who completed their undergraduate studies this year: Aaron Cravens (B.S. Mathematics/Biomedical Engineering), who will start graduate studies in Bioengineering at Stanford University, and Chandra Ade-Brown, who will begin graduate school at Rutgers University after an internship in a biotech company. As these students move on with their careers, the lab welcomes the arrival of an enthusiastic group of new undergraduate research assistants, John DeCourcey ('15), Qi Ying (Queenie) Li ('15), Katherine Grasso ('16), and Matthew Carbone ('16), who have become part of the group during the academic year and/or as REU fellows over the summer.

Throughout the past year, Rudi visited and gave invited talks at a number of universities and colleges across the country. Most noteworthy are his participation in the Organic Young Investigator's Symposium at the 247th ACS National Meeting in Indianapolis, to the student-organized Chemical Biophysics Symposium at U. Penn., and to the 15th Tetrahedron Symposium in London, UK, on the occasion of which he received the 2014 Tetrahedron Young Investigator Award in Bioorganic and Medicinal Chemistry. Finally, the group was happy to celebrate Josh Kolev for receiving an Elon Huntington Hooker Fellowship, and Rudi for his promotion to the rank of Associate Professor. On the personal level, Rudi, Francesca, and their daughter, Penelope, were thrilled about the arrival of a new addition to the family, Maia Priscilla Fasan, who was born in September of 2013.

Maia Priscilla Fasan

Ignacio Franco

Assistant Professor of Chemistry — Ph.D. 2007, University of Toronto

RESEARCH INTERESTS

Laser control of electronic properties and dynamics, electronic decoherence in molecules, theory and simulation of single-molecule pulling processes, novel spectroscopies and control in single-molecule junctions.

CONTACT

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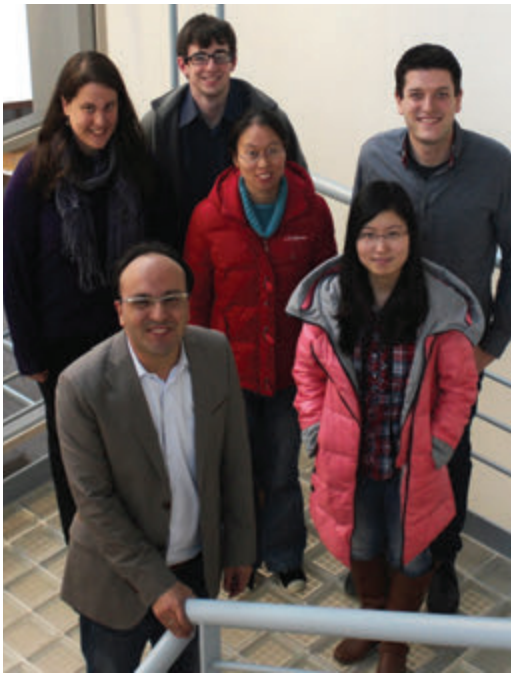
It has been an exciting inaugural year in **IGNACIO FRANCO'S** group. Our group offices are now set, "Femto" our infiniband connected computer cluster is fully operational and three Ph.D. students -**PETER THAYER, ZHI LI** and **RACHEL CAREY**- and two postdoctoral fellows -**LIPING CHEN** and **ARNAB KAR**- have now joined the lab. We have been very fortunate in our recruiting efforts and have been able to attract top interdisciplinary talent into the group. Liping, who has been in the group since day one, came to us from David Beljonne's lab at the University of Mons. Liping has brought tremendous experience in both electronic structure and quantum dynamics. She's currently investigating laser-induced electronic transport along nanoscale junctions. Arnab recently joined the group after completing a Ph.D. in High Energy Physics under S. G. Rajeev at the University of Rochester on a highly prestigious Messersmith Fellowship. Arnab is currently using and adapting his sophisticated mathematical and physical toolbox to gain deep insights into electronic decoherence processes in molecules. Peter joined the Ph.D. program in Chemistry after graduating as the top ranked senior in the School of Engineering at the University of Rochester and is currently investigating Stark effects on the nanoscale. Zhi came to Rochester from China where she completed a B.S. in Condensed Matter Physics at USCT Hefei. Rachel is from Albany, NY, and has a mixed background in Chemistry and Physics, graduating from Le Moyne College in 2011. Both Rachel and Zhi are working towards the understanding of the integration of single-molecule pulling with molecular electronics. In addition, we had **ALESSANDRO PIRROTTA**, a Ph.D. student from the University of Copenhagen, visiting us for two months in 2014. During his stay he computationally investigated the mechano-electric properties of hydrogen-bonded complexes. Ignacio taught Quantum Mechanics in the graduate program (CHM 451) for the first time. What a wonderful experience! In addition, Ignacio coordinated a weekly pedagogical "Dynamics Seminar" that is meant to complement the training of the students in the group. This seminar helps us bridge the knowledge gaps that are often encountered when carrying out interdisciplinary work.

In terms of travel, Ignacio gave lectures in Telluride, Stony Brook, Medellín and Vancouver, and attended two Gordon Research Conferences. Peter traveled to Spain to attend the famous Benasque workshop on Time-Dependent Density Functional Theory (TDDFT) on a NSF travel grant. In addition, Ignacio co-organized a meeting entitled "Modeling Single-Molecule Junctions: Novel Spectroscopies and Control" that took place in Berlin from October 14-16, 2014. The meeting was very successful and resulted in several new international collaborations among participants. We also had the good fortune of hosting Prof. Mark Ratner from Northwestern University Dec. 10-12 as the 2013 Noyes Lecturer. Mark gave three delightful and well-attended lectures. It was great to have him here! On a personal note, the Franco family is doing great and getting settled into the Rochester community. Martín (now 3) continues to pursue his keen interest in the animal kingdom and is getting ready to start at the Harley School in the Fall. We look forward to a successful new year of research, teaching and service.



The Franco Group

Alison J. Frontier

Associate Professor of Chemistry

Ph.D. 1999, Columbia University

RESEARCH INTERESTS

Synthetic organic chemistry; synthesis of bioactive natural products; pericyclic reactions; asymmetric catalysis; cationic cascades.

CONTACT

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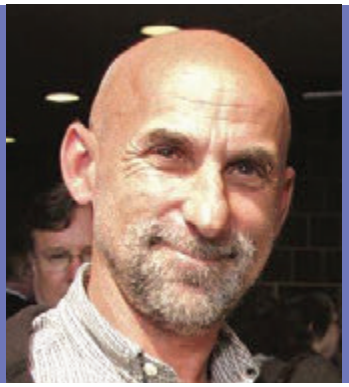
Professor **ALISON FRONTIER'S** research program is devoted to synthetic organic chemistry. Research directions being pursued in the lab include the study of novel pericyclic reactions, cationic rearrangements and stereoselective cyclization cascades, and their application to complex molecule synthesis. Projects focus on reactions that can produce unusual, densely functionalized ring systems from simple precursors for rapid assembly of polycyclic structures found in rare natural products. The lab has conducted an extensive study of the Nazarov cyclization over the past ten years, and identified several variants of the reaction that allow synthesis of many different highly substituted cyclopentanes. Continuing the work of **JOSHUA BROOKS (Ph.D.'12)**, **STEPHEN JACOB (M.S.'11)** found that both 4π (Nazarov) electrocyclization and 6π electrocyclization pathways are available to dienyl diketones in the presence of amine nucleophiles, and **YU-WEN HUANG (M.S.'11)** has discovered an enantioselective version of the same reaction.

Our ongoing collaboration with Rich Eisenberg has become focused on a novel type of heterogeneous gold catalyst and its Lewis acidic reaction chemistry, and the first report appeared early this year. New studies of cationic cyclization cascades carried out by **DAN (JESSIE) WU (M.S.'14)** strengthen our conviction that the gold complex offers exciting alternative reactivity, compared to conventional Lewis acids. **PETER CARLSEN (M.S.'11)** completed the first synthesis of the tetracyclic core of tetrapetalone A. In the past year, this challenging project led to a collaboration with Prof. Amir Hoveyda (Boston College) and his group, which allowed us to improve the efficiency of a critical ring-closing metathesis.

This year, we welcome Patrick Harrington (coming from Rensselaer Polytechnic Institute (RPI)) and Eric Stoutenberg (from Niagara University) to the group. Lastly, Alison was grateful to visit two former students in Beijing in May: **WEI HE (Ph.D.'07)**, and **CHAO JIANG (Ph.D.'09)**.

Joshua L. Goodman

Professor of Chemistry — Ph.D. 1984, Yale University



RESEARCH INTERESTS

Organic chemistry: use of two complementary techniques, nanosecond laser flash absorption spectroscopy and pulsed time-resolved photoacoustic calorimetry to observe transient reaction intermediates produced following an initial photochemical event.

CONTACT

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JOSH GOODMAN is currently serving as the chair of the Undergraduate Studies Committee. His research interests are focused on the investigation of organic reaction mechanisms using a variety of time-resolved techniques such as pico- and nanosecond absorption spectroscopy, and photoacoustic calorimetry. In particular, he has been examining processes in which electron transfer is coupled to bond breaking, and/or bond making. These bond-coupled electron transfer (BCET) reactions have the potential to drive chemical reactions using light. His studies focus primarily on dissociative return electron transfer (DRET) reactions that involve cleavage of C-C, Si-Si, and Ge-Ge bonds.

William D. Jones

Charles F. Houghton Professor of Chemistry — Ph.D. 1979, California Institute of Technology

RESEARCH INTERESTS

Mechanisms of reactions of transition metal organometallic compounds; activation of carbon-hydrogen, carbon-carbon, and carbon-fluorine bonds by transition metal complexes; transition metals as catalysts for the desulfurization of thiophenes in oil; electrophilic C-H activation and direct routes to aromatic amines.

CONTACT

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The **JONES** group continues to actively pursue organometallic chemistry and catalysis. We had two new graduate students join the group this year, Jing Yuwen and Matt Sleck. Dr. Sumit Chakraborty also joined the group in August. The lab has 12 people now, and a few summer undergraduates as well. Our research is examining the activation of C-H bonds in substituted hydrocarbons, the cleavage of carbon-carbon bonds in alkynes and nitriles, the C-S cleavage/hydrogenation of thiophenes, and the acceptorless dehydrogenation of amines and alcohols. An important advance this year has been the elucidation of factors that control metal-carbon bond energies, such that we can now predict which products will be favored in a variety of reactions. These studies have been extended to see the effects of different ancillary ligands. The group continues its role in the Center for Enabling New Technologies through Catalysis (CENTC), in which the group has collaborative research projects that are exploring new electrophilic C-H activation catalysts and new direct routes to aromatic amines from benzene. Bill continues as Associate Editor for the Journal of the American Chemical Society for an eleventh year, where he handled close to 500 manuscripts last year. He lectured in/at York, Hefei, Heidelberg, Brown, Exxon, Wayne State, and Rennes.

The group's scientific accomplishments have centered upon our work in alkane C-H bond activation, in which we showed that a rhodium complex first binds to an alkane and then cleaves the C-H bond. Studies have shown that the metal will only break the C-H bonds in the terminal methyl groups. Analysis of a variety of substituted hydrocarbons has now shown that alpha-electron withdrawing groups actually weaken metal-carbon bonds, not strengthen them, which appears to fly in the face of the conventional wisdom. While weaker, these bonds are not as weak as they should be (based upon the corresponding C-H bond strengths), and therefore behave as if the bond has been strengthened. Confused? Read our manuscript that appeared in *J. Am. Chem. Soc.* **2013**, *135*, 6994. The effects of ancillary ligands were established by examining PMe_3 and $P(OMe)_3$ ligands, see: *J. Am. Chem. Soc.* **2013**, *135*, 16198 and *Chem. Sci.* **2014**, 4, 804.

Our work in C-H activation is also continuing in a collaborative research effort in the Center for Enabling New Technologies through Catalysis (CENTC). This NSF-funded center includes researchers from a dozen universities participating in joint projects and using cyber-conferencing to discuss results. This mode of research is testing a new paradigm for conducting research and is beginning its eighth year of phase 2 funding ($4M/yr). Our group is also continuing mechanistic work on C-CN cleavage. We have determined that in C-CN cleavage of benzonitriles, coordination to the arene, not the nitrile, precedes bond cleavage. Detailed DFT studies have been used to support this pathway, and a novel migratory process of the metal has been elucidated.

Sarah, baby Henry, and Bill Jones

Bill taught at the Heidelberg Catalysis school this spring, and was also invited back to China this fall to help teach a course in kinetics to young Chinese professors. He will serve on the International Advisory Board for the ICOMC, ICHA, and OM&Cat conferences. The group is supported by continuing funding from the Department of Energy, the National Science Foundation, the NSF Center Enabling New Technologies through Catalysis, and a GE based EFRC grant.

Bill and his wife Heather are now the proud grandparents of Henry William Simson, born on September 10, 2014 to their daughter Sarah and her husband Michael.

Todd D. Krauss

Professor of Chemistry

Ph.D. 1998, Cornell University

RESEARCH INTERESTS

Physical chemistry; synthesis and characterization of nanometer scale materials and devices with relevance for renewable energy, techniques include single molecule photoluminescence spectroscopy, atomic force microscopy, ultrafast and nonlinear optical spectroscopy. Biophysical chemistry; single molecule studies of protein folding structure and dynamics.

CONTACT

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Time for that annual report on the comings and goings of the **KRAUSS** group!

We are going to have a busy remainder of the year with Ph.D. graduations. **JULIE SMYDER (M.S. '07)** and **HELEN WEI (M.S. '09)** are writing thesis chapters and we expect they will be defending their theses this fall. **LENORE KUBIE (M.S. '11)**, a joint Krauss-Bren student, successfully defended her thesis in early August on the photoinduced charge transport between heme containing proteins and carbon nanotubes, as well as some biologically inspired ways to make efficient and robust electrocatalysts for proton reduction to hydrogen. **FEN QIU (M.S. '10)** is also writing thesis chapters (and a second manuscript!) on the use of semiconductor nanoparticles of various sizes, shapes and compositions as robust photosensitizers for the photochemical production of hydrogen, and we expect she will defend her thesis this year. Finally, **CUNMING LIU**, still our first and only materials science student, has just submitted his first paper on the ultrafast spectroscopy of hole dynamics of CdSe nanoparticles. He is writing up his second paper on the ultrafast dynamics of electron transfer to our favorite Ni-catalyst and then he will be ready to graduate as well – likely in the late fall too!

AMANDA PRESKE (M.S. '12) spent more time in Ghana this spring as part of the NSF IGERT Fellowship program. When not in Africa or selling jewelry (check out her article in the May Rochester Review!) she is controlling the size of PbSe nanocrystals by changing the ligand attached to the Se during the synthesis. Combined with the fact that we can scale up the synthesis to grams scale with no loss of nanocrystal quality this result is quite exciting!

GREG PILGRIM (M.S. '12) published his first paper on the fabrication of vertically aligned carbon nanotube membranes, which can conduct both protons and electrons. While an interesting discovery, even better is that Greg has synthesized membranes made with semiconducting single-walled nanotubes, which due to their smaller diameter and semiconducting nature, may someday provide an important solution to the decades old artificial photosynthesis problem. We felt that this result was important enough (and the University agreed) that we submitted a patent on the membrane technology. **NICOLE BRIGLIO COGAN (M.S. '11)** also had a paper published this year in collaboration with the Nilsson laboratory on using short peptides with non-natural amino acids to create suspensions of carbon nanotubes that show interesting fluorescence properties. Nicole has built an inspiring low temperature single molecule fluorescence microscope and she is excited about testing it out this year. **KELLY SOWERS (M.S. '11)** is also writing her first paper on shelling CdSe quantum dots with CdS but using secondary phosphine sulfide precursors. The exciting discovery is that quantum dots with anion or cation termination behave quite differently with respect to their fluorescence, and Kelly has also discovered that she can control the synthesis to a high level of precision.

ZHENTAO HOU (M.S. '13) is studying carbon nanotube photophysics with high spatial resolution on the single tube level as well as looking into using heat to remove defects from the nanotubes. **AMANDA AMORI (M.S. '14)** has used various polymers to isolate specific nanotube species in solution and has subsequently put together a nice fundamental story on the temperature dependence of nanotube photoluminescence for various nanotube structures. As part of the NSF IGERT fellowship program **LEAH FRENETTE (M.S. '14)** is spending the summer work-

ing in the laboratory of David Norris at the ETH in Zürich! Lucky Leah! The only down side is that Leah had to suspend her work on the mechanism of chemical bond formation in CdSe nanoparticles, which we expect she will finish shortly after returning to the U.S. in the fall. **JENNIFER URBAN (M.S. '14)**, our first joint Nilsson-Krauss student, is working on attaching antibodies onto CdSe quantum dots for the purpose of studying protein clusters in the synapse of neurons with super-resolution microscopy. The hypothesis is that the structure of these proteins will change upon exposure to HIV and HIV drugs, which may be important in understanding neurocognitive disorders associated with HIV.

Finally, we wanted to welcome new student **ABBY FREYER** into the group! Abby is working on doping CdSe quantum dots with silver and using force microscopy to identify how many dopants are inside the nanoparticle and perhaps their spatial distribution. We are excited to have her join the team!

We had an exciting and volatile year for the research scientists in the group. Former group member **JEFF PETERSON (Ph.D. '07)** joined the group in July 2013 as a senior scientist. Jeff worked on getting electrostatic force microscopy to work with the new force microscope. I am glad to say Jeff won the long battle with the AFM! Jeff also gave much of his time to working with the students on their manuscripts and provided immeasurable guidance and insight when I was not available. Jeff went back to a faculty position at SUNY Geneseo in the fall, and we were delighted to welcome **DR. SANELA LAMPA-PASTIRK** to our group as a staff scientist. Postdoctoral fellow **DR. MICHAEL ODOI** got a real job in California working for a semiconductor nanoelectronic processing company. More importantly, Michael is now a proud father. (Congratulations)^2 Michael! **Dr. SEBASTIAN SCHAEFER** published a fantastic paper on the spectroelectrochemistry properties of individual nanotubes whereby he found that different nanotubes can have wildly different reduction and oxidation potentials. Sebastian has since returned to Germany and is awaiting his next position.

During the summer, the group hosted undergraduates Chris Vela, Dylan Gaeta and Kevin (Skippy) McClelland from the University of Rochester. Chris worked on solubilizing and sorting nanotubes with Zhentao and Amanda Amori, Dylan worked on making PbSe quantum dots water-soluble, and Skippy worked on making CdTe quantum dots water-soluble. Skippy and Dylan then used their water-soluble quantum dots for applications in solar hydrogen production.

Todd and UR alum **BRETT SWARTZ (M.S. '06, Ph.D. '10)** are still looking to get their new company started, called Advanced Quantum Imaging. We did get a shot in the arm from the Rochester Business community, as we took second place in the Rochester Business Plan Competition. Not bad for a couple of scientists!

Robert W. Kreilick

Professor Emeritus of Chemistry — Ph.D. 1964, Washington University

RESEARCH INTERESTS

New experimental and theoretical techniques to study molecular structure and electronic properties of transition metal complexes and paramagnetic organic molecules; and measurement of electron transfer rates between molecules held in polymers.

CONTACT

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Professor Emeritus of Chemistry, **ROBERT KREILICK**'s research involved investigations of magnetic and electrical properties of solid transition metal complexes and organic free radicals. Experiments which produce information about electron-electron exchange interactions, dipolar interactions, and electrical conductivity are conducted. New software was written for the ESR spectrometer and low temperature equipment was brought back into working order.

Thomas R. Krugh

Professor of Chemistry — Ph.D. 1969, Pennsylvania State University

RESEARCH INTERESTS

Biophysical chemistry; structural analysis of biomolecules from two-dimensional NMR, fluorescence, and UV-visible spectroscopies, along with energy minimization and molecular dynamics calculations.

CONTACT

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During the past year **TOM KRUGH** continued his support of graduate and undergraduate education. During the spring and summer his main project involves organizing our NSF-supported Research Experience for Undergraduates (REU) program. This summer (2014) we had 28 undergraduates participating in the REU program. Nine students were from other schools along with 19 UR undergraduates. Our REU program reflects support for undergraduate research by faculty, the Chemistry Department, and the College. Undergraduate research provides an opportunity for graduate students (and postdocs) to gain leadership experience through one-on-one mentoring of undergraduates, both in the summer and during the school year. Mentors often describe their experience as important milestones in their graduate career.

REU group

David W. McCamant

Associate Professor of Chemistry

Ph.D. 2004, University of California, Berkeley

RESEARCH INTERESTS

Ultrafast vibrational spectroscopy of structural dynamics in photochemistry; vibrational coupling and relaxation; structural rearrangements and relaxation mechanisms in photo-excited nucleic acids; Ultrafast energy and electron transfer processes relevant for solar energy systems.

CONTACT

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The **MCCAMANT** group has grown this year, and is continuing femtosecond laser studies of photochemical molecular dynamics. **BARBARA DUNLAP (M.S. '11)** moved on up to seventh order (!) Raman experiments after her last publication on fifth-order two-dimensional Raman spectroscopy. **RANDY SABATINI (M.S. '11)** has been working hard to understand the collection of dyes we receive from the Detty lab in Buffalo and their applications to solar hydrogen production. His efforts produced a massive and interesting article in JACS this spring. Working with Randy on the solar hydrogen project are second-year **EMILY HILLENBRAND** and two new first year students, **DAN MARK** and **MIKE MARK** (brothers in research only). Dan received an IGERT fellowship this spring to pursue his studies of novel dyes and catalysts for solar hydrogen production. Mike is tackling the photophysical characterization of a new series of dyes that absorb across a wide spectrum in the visible region. This summer, **CHRISTA CATALFAMO** from SUNY Geneseo, has joined the solar hydrogen project through the department's REU program. **ZAK PIONTKOWSKI**, a UR Chemical Engineering undergrad, has been helping out the projects doing advanced computational work before he matriculates as a graduate student in our department in the fall.

The DNA project is powering along with exciting new work by post-doc **COLLINS NGANOU**, who has spearheaded molecular dynamics simulations of our DNA tetramers to elucidate the extent of pi-stacking in those systems. Collins has been joined by two great undergraduates, **DANA BARNETT** and **CLAYTON STUMPF**, who started working in the lab this spring and have continued into the summer. Collins, Dana and Clayton are also performing transient absorption studies of the DNA oligomers to observe the ways in which adjacent purines modify the thymine excited state lifetime. Concurrent with the oligomer work, **JOOHYUN LEE (M.S. '12)** has finalized some nice spectra of the dGMP nucleic acid and a publication is imminent.

Dave was honored to receive the Journal of Physical Chemistry B lectureship award in 2013, for which he was invited to present at the ACS fall meeting in Indianapolis. There, he also presented new femtosecond stimulated Raman spectroscopy methodologies as part of the "Chemistry at the Space-Time Limit" symposium. Also in the summer of 2013, Dave enjoyed a great trip to a Telluride workshop on Quantum Dynamics and Spectroscopy in Condensed-Phase Materials and Bio-Systems. Dave, Caroline and the family are all doing well with Elise (12) starting middle school in 6th grade, Lydia (8) having a great year in 3rd grade and Nora (5) starting kindergarten.

McCamant Group (Back, left to right) Randy, Barbara, Emily Mike, Zak, Clayton. (Front) Dana, Christa, Dan, Joohyun, Collins, Dave.

John S. Muenter

Professor Emeritus of Chemistry

Ph.D. 1965, Stanford University

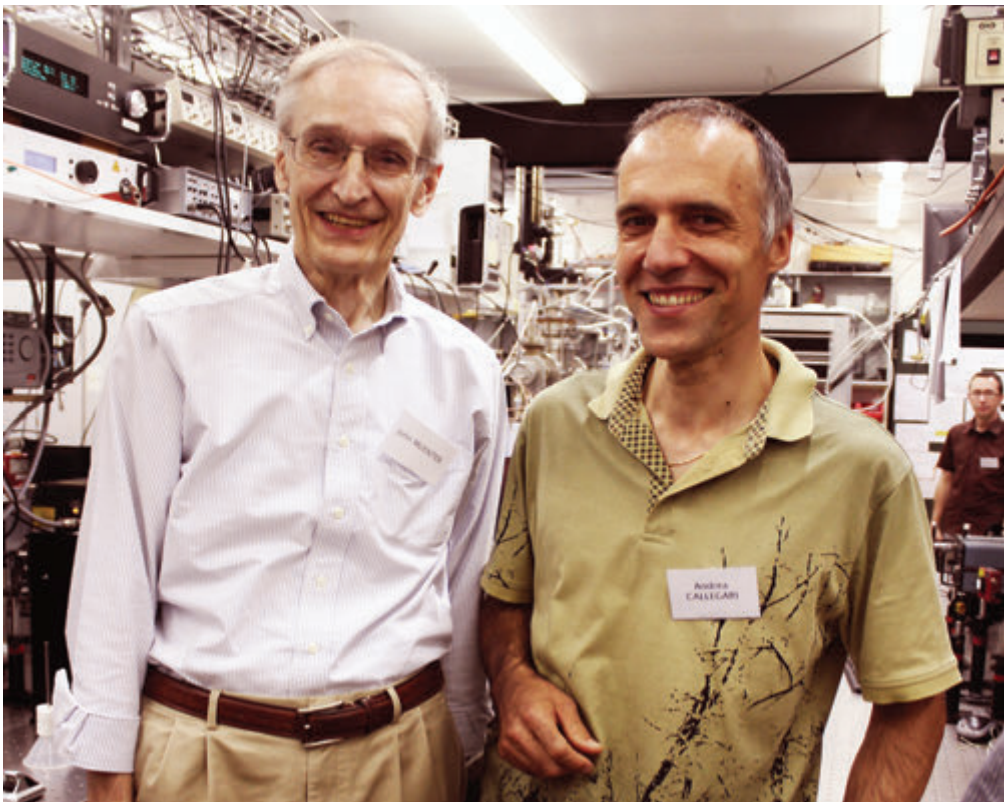
RESEARCH INTERESTS

Molecular spectroscopic studies of inter- and intramolecular interactions using molecular beam, microwave, and laser techniques.

CONTACT

muenter@chem.rochester.edu

For **JOHN MUENTER**, the past year has been much the same as the past few years; busy with nonacademic interests: travel, family, classical music, etc. However, molecular spectroscopy is still important to him and he continues to spend one week every couple of months working at MIT with Bob Field's research group. Two milestones were passed in 2014: John attended his 50th International Molecular Spectroscopy Symposium and his 100th publication has appeared. While he is no longer a senior author, he is pleased to still be contributing to science 45 years after beginning as an Assistant Prof. at the University of Rochester.



John Meunter and Andrea Callegari (EPFL)

Michael Neidig

Assistant Professor of Chemistry

Ph.D. 2007, Stanford University

RESEARCH INTERESTS

Physical-inorganic chemistry and catalysis: elucidation of structure and bonding in non-precious metal catalysts through inorganic spectroscopic methods; studies of reaction intermediates and mechanisms of transition metal catalysis; non-precious metal organometallic, biological and heterogeneous catalysis

CONTACT

neidig@chem.rochester.edu

MICHAEL NEIDIG'S group has continued to expand during their third year at Rochester. The group currently consists of seven Ph.D. students, with **TESSA WOODRUFF** (Miami U.) and **VALERIE FLEISCHAUER** (Buffalo State) joining the group this past Fall. We were excited to also have undergraduates **JOE BAILEY** and **ARI SHAPS** with us this past year. Our research on iron-catalyzed reaction in organic synthesis continues to expand, including research on bisphosphine and NHC ligand systems. We have published our first major study this year in Journal of the American Chemical Society detailing our methodology and its use for the first direct elucidation of iron speciation and reactivity in iron-bisphosphine cross-coupling. We have also published a few papers with collaborators, including studies on iron-pincers and iron-NHC complexes. We have hosted several students from synthetic labs in our group this past year, continuing our efforts to help other researchers incorporate physical-inorganic expertise into their groups. Finally, **KATHLYN FILLMAN (M.S. '14) , MALIK AL-AFYOUNI (M.S. '13)** and **JARED KNEEBONE (M.S. '13)** all presented their research at the International Symposium on Homogeneous Catalysis (ISHC) XIX meeting in Ottawa and a good time was had by all.

Mike and co-PI Dave McCamant were pleased to find out in July 2014 that they were awarded an NSF instrumentation grant. The intent of the proposal is to create a multi-user facility for continuous wave (CW) Raman experiments on solution, solid state and frozen glass samples as well as in-situ measurements during catalysis or gas/chemical treatment across multiple excitation wavelengths at temperatures ranging from room temperature to liquid helium at -269 °C.

Neidig Group

Bradley L. Nilsson

Associate Professor of Chemistry — Ph.D. 2003, University of Wisconsin, Madison

RESEARCH INTERESTS

Bioorganic chemistry and chemical biology; amyloid peptide self-assembly; Alzheimer's disease; amyloid-inspired materials, HIV infectivity and microbicide development.

CONTACT

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The **NILSSON** group experienced a busy period of research, teaching, and service during 2013–2014.

RIA SWANEKAMP (M.S. '10) completed her thesis research in December 2013 and accepted a teaching appointment in the Chemistry Department at Allegheny College for the Spring 2014 semester. She spent the spring writing her Ph.D. thesis and teaching several sections of general chemistry. She defended her Ph.D. thesis entitled "Understanding the fundamental mechanisms that drive amphipathic peptide self-assembly" on August 8, 2014. She recently published a manuscript describing the comparative behavior of multicomponent amyloid-like rippled beta-sheet materials to proteolytic degradation (*Chemical Communications* **2014**, 50, 10133-10136). Three additional manuscripts from her Ph.D. work are nearly complete and ready for submission. **JOHN DIMAIO (M.S. '10)** is also nearing completion of his Ph.D. research. He has spent the summer of 2014 writing his thesis and preparing manuscripts detailing his work with amyloid peptides as materials to prevent sexual transmission of HIV. We anticipate that three manuscripts will be ready for submission by the end of the summer. In September, John began studies in the Law School at the University at Buffalo. We anticipate that he will defend his thesis during the Spring 2015 semester.

WATHSALA LIYANAGE (M.S. '11) has also had an incredibly productive year in the Nilsson group. She is in various stages of writing no fewer than six manuscripts with additional projects advancing rapidly! She has made tremendous progress understanding and applying hydrogels derived from phenylalanine as materials for ex vivo tissue culture. In addition to this work, she has discovered that some of these materials have interesting properties as optical wave-guides, an entirely new and unanticipated area of research for the Nilsson group. We anticipate that Wathsala will complete her Ph.D. studies during the 2014/2015 academic year. **ANNADA RAJBHANDARY (M.S. '13)** has also continued to make breakthroughs in the development of self-assembled materials derived from phenylalanine. Her work has been instrumental in helping us understand the structural basis for self-assembly of these types of materials. She also submitted a manuscript for a book chapter, "Self-Assembling Hydrogels", that will appear in the forthcoming "Fundamentals of Hydrogels" which will be published in late 2014.

The Dandelion Square Clock Tower (J. Adam Fenster)

DANIELLE RAYMOND (M.S. '14) and **JEN URBAN (M.S. '14)** have both completed the qualifying exams and have been advanced to candidacy for the Ph.D. degree. They have been outstanding additions to the group and have both had a tremendous start to their graduate careers. Danielle has expanded our exploration of rippled beta-sheet materials derived from the co-assembly of enantiomeric peptides. Her work is opening interesting new avenues for the application

of these novel materials. Jen, who is a member of both the Nilsson and Krauss groups, is working in an entirely new area: the application of quantum dots for super high resolution imaging of cellular processes. Their research projects are shifting into high gear and we have high expectations for both of them in the coming year. The Nilsson group also welcomed **JADE WELCH** as the newest member of the group during the 2013/2014 academic year. She has had a strong start and has already appeared as a contributing author on a recent Nilsson group publication (*Chemical Communications* **2014**, 50, 10133-10136). We're excited to have her in the group!

GENKI TAMIYA (B.S. '13), who conducted his senior thesis research in the Nilsson lab last year, continued his project during the 2013-2014 academic year as he completed a fifth year towards an M.S. degree in chemistry. Genki has returned to Japan and is currently working towards acceptance to medical studies there. **KAITLYN CONNELLY (B.S. '14)** completed her senior thesis research in the Nilsson group this year and has since moved on to graduate studies in chemistry at Rutgers University. We wish her the best of luck in her future endeavors. This year we added a number of talented undergraduate students to our research group. **BENJAMIN MEATH, RUIJIA ZHU, and SAGAR PATEL** are University of Rochester undergraduates who have initiated research projects in the Nilsson group in the last year. Ben and Sagar were both NSF REU fellows during summer 2014 and Ruijia was a DeKiewet Fellow (Biology). In addition, **MELISSA CADENA** (Texas A&M) also spent the summer of 2014 in the Nilsson group as an REU fellow. We enjoy the energy and contributions these undergraduate researchers bring to the group and look forward to our continued association.

Brad continues to serve as chair of the Harrison Howe Award Committee (Rochester Section of the American Chemical Society); he also continues to serve as an elected member of the national Nominating Committee of the American Peptide Society (term of service 2013–2015). He taught the CHM 204 organic chemistry lecture for the second time in the Spring 2014 semester and also taught the Bioorganic Chemistry and Chemical Biology Course during Spring 2014. Brad and fellow faculty member, Rudi Fasan, have recently had a book proposal to write a graduate textbook in bioorganic chemistry accepted and have started this work, which will be completed in two years. With plenty of work to keep us busy, the Nilsson group looks forward to another exciting year of exploration in chemistry.

Lewis J. Rothberg

Professor of Chemistry

Ph.D. 1983, Harvard University

RESEARCH INTERESTS

Physical chemistry: photophysics of conjugated organic materials for solid-state lighting and solar energy conversion, metal nanoparticle-enhanced molecular spectroscopy, biomolecular sensing.

CONTACT

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LEWIS ROTHBERG'S group continues to work on the fundamental photophysics of luminescent conjugated polymer films and how these impact device applications of those materials. **CHI-SHENG CHANG** has demonstrated how metal nanoparticles can be incorporated into organic device structures and used to enhance both light-emitting diode and solar cell technology. **CHRIS FAVARO (M.S. '11)** has invented new ways to make and incorporate plasmonic scattering layers into OLEDs and the group is beginning to collaborate with OLEDWorks, a local manufacturer, to investigate potential commercial benefits of this work. **BEN MARTIN'S (M.S. '11)** struggles to observe single polymer chain spectroscopy have now borne fruit and we look forward to several interesting publications on the root causes of intensity fluctuations and photostability in fluorescent conjugated polymers. Meanwhile, materials science doctoral student **RAJ CHAKRABORTY** has started experiments to reveal how and why electric and magnetic fields affect the polymer photophysics with some surprising results that contradict the prevailing wisdom in the field. Senior scientists **AL MARCHETTI** and **RALPH YOUNG** are still working independently, and with students in the lab, while publishing outstanding work. Funding pressures have reduced the group size and moved Lewis' center of gravity towards the lab where he is working extensively with the graduate students and two bright undergraduates, **AARON BALLIET** (investigations of the spectroscopy of fluorene polymers upon aggregation), and **MICHAEL HAGGMARK** (surface attachment chemistry for biomolecular sensing). We are also working closely with **XUNZHI LI** in Alex Shestopalov's Chemical Engineering group to implement new surface attachment chemistry for biomolecular sensing that replaces hydrolytically unstable Si-O bonding on silicon.

Lewis once again thoroughly enjoyed teaching junior level statistical thermodynamics (CHM 252) and the course went extremely well. He continues to teach the advanced spectroscopy lab (CHM 232) with able assistance from **RAY TENG (B.S. '83, M.S. '87, M.B.A. '01)** and excellent teaching assistants, while beginning to make plans to overhaul and modernize that signature course.

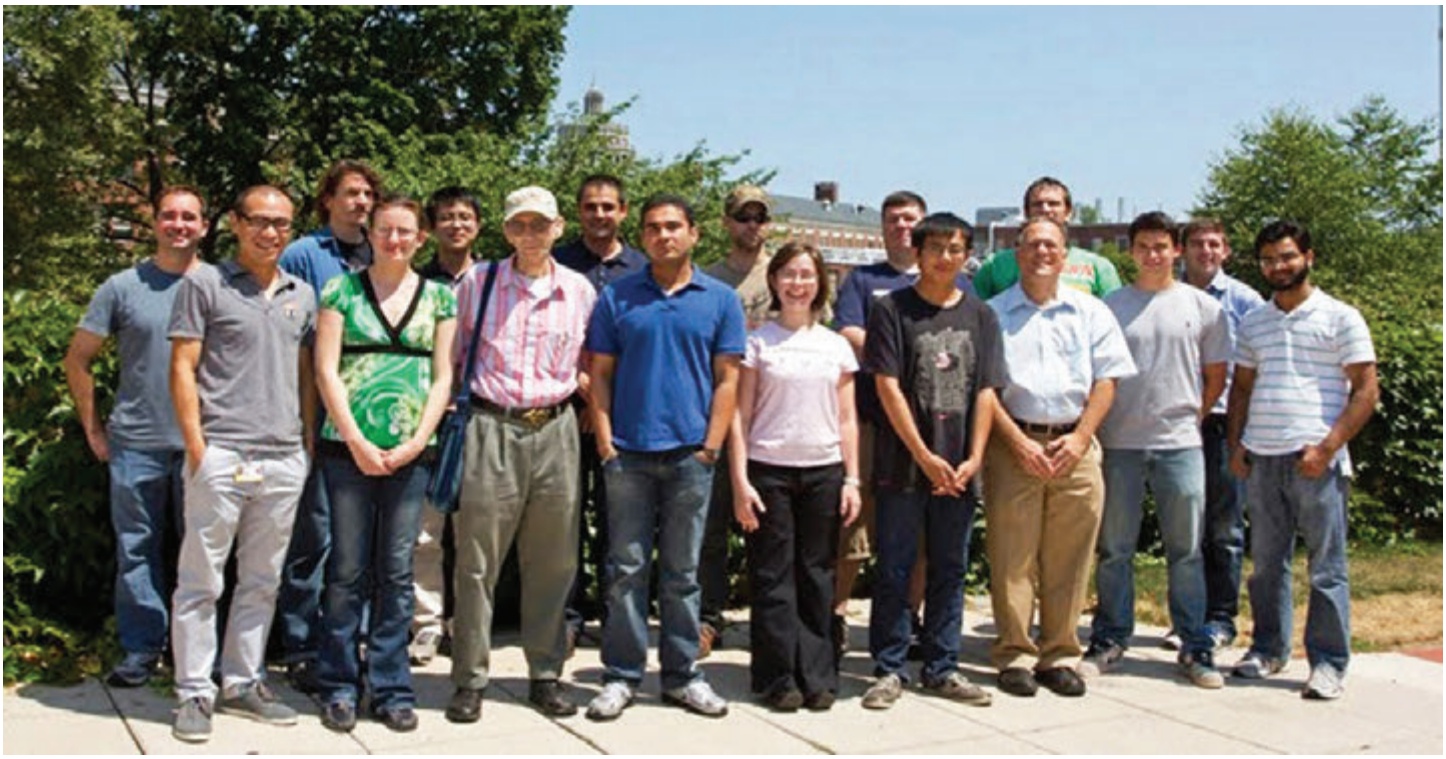
The group presented work at many meetings and institutional seminars. A particularly gratifying meeting was the international conference on optical probes of conjugated polymers held in Durham, the 10th in a series started by Lewis and Valy Vardeny in 1992. The vitality of the meeting and the field was evident, and there remain many exciting developments even as the understanding of conjugated polymers matures and organic electronics becomes commercial technology. What the field has

accomplished was highlighted for me when **PROFESSOR CHING TANG** showed us the remarkable new 55 inch diagonal OLED television made by LG Electronics and now available in electronics stores. Lewis also enjoyed giving an invited presentation at the Excited States conference in Santa Fe run by Sergei Tretiak, a Rochester chemistry alumnus.

In addition to teaching and research, Lewis was appointed head of the Materials Science program at the University, a Ph.D. and MS granting interdisciplinary program that has now grown to nearly 50 students. The program is blessed with strong support from new program coordinator Gina Eagan, plus a dedicated collection of faculty from multiple departments committed to improving this discipline at Rochester. We put together a Materials Research Center proposal to the NSF, and various groups of faculty participated in several other block grant applications designed to stimulate collaborative work in this area. We also coordinated the annual materials symposium in May, and Lewis is excited about bringing additional energy to that symposium series and the interdisciplinary seminar program.

As forecast, the past year was very stressful for Diffinity Genomics, a small biotechnology company formed to commercialize technology developed in our lab by Dr. Huixiang Li. The company is nearly out of cash and reduced to a skeleton staff but continues to sell product and has received a trial buyout offer from a larger company. Lewis described his entrepreneurial experience for the students in the NSF-REU summer program and had the opportunity to reflect on and be grateful for the fascinating and challenging range of opportunities made possible by the department and University.

Finally, Lewis and his group will dearly miss our esteemed friend and colleague **MARTY ABKOWITZ** who was killed in a freak accident this past winter. Marty made seminal contributions to the science of charge transport in disordered organic materials that laid the foundation for modern electrophotographic receptors and, more recently, OLEDs. Marty's wife Rollie kindly donated his library and equipment to the University and one memorable experience was helping to clear the Abkowitz basement of a remarkable treasure trove of instrumentation that Marty used after retirement to continue time-of-flight photoconductivity and capacitive measurements on promising organic photoconductors. Much of that equipment was absorbed into the Rothberg lab and is proving quite useful, so we think of Marty fondly and often.



William H. Saunders

Professor Emeritus of Chemistry — Ph.D. 1952, Northwestern University

RESEARCH INTERESTS

Ab Initio and Valence Bond Calculations of Proton Transfer and Elimination Reactions

CONTACT

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In early July 2013 I visited my son Claude and Gulchin in their new home in Portland Oregon. The visit included viewing July 4 fireworks from the roof of the office building where Claude worked, and a day spent exploring wineries. In August I spent a few days at the Stratford Festival with my daughter Anne. One of the plays we enjoyed was the classic avant garde "Waiting for Godot." I took a bicycling trip in September in the Netherlands, a nicely flat country for an aging cyclist. We had a few days in Amsterdam where I visited the impressively renovated Van Gogh Museum. The winter was not a pleasant one, with the weather accompanying the vicious polar vortex keeping me indoors most of the time. I received sad news in May that my first postdoc, Smiljko Asperger, had died in Zagreb, Croatia. The computational study of orientation in elimination reactions that I had been working on in collaboration with Scott Gronert of Virginia Commonwealth University was finally completed, and we hope to get it written up for publication shortly.

Wolf-Udo Schröder

Professor of Chemistry — Ph.D. 1971, University of Darmstadt, Germany

RESEARCH INTERESTS

Basic and applied nuclear science: dynamics of complex nuclear reactions at intermediate and high energies; dissipation, relaxation and other transport phenomena; non-equilibrium effects; thermodynamics of nuclear disintegration and transmutation; the equation of state of nuclear matter. Beyond the mean field: correlations and clusterization of nuclear matter. Light-ion reactions in a thermonuclear environment. Chemi-and physisorption of tritium in metals.

CONTACT

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UDO SCHRÖDER'S group has continued research in radiochemistry, heavy-ion reaction dynamics, advanced detector development, as well as development of laser induced acceleration of ions for nuclear Science (LIANS). Theoretical work based on a simple but successful quantum statistical model of finite nuclei has addressed one of the major gaps in our understanding of the excitation modes and the stability of atomic nuclei. A new, fundamental mode of nuclear decay ("spinodal vaporization") has been found responsible for a host of previously enigmatic and misinterpreted experimental observations such as the existence of a limit to the temperature that can be sustained by nuclei. In heavy-ion experiments conducted at the Italian laboratory LNS Catania at low and intermediate bombarding energies, the group has made several unexpected observations: At intermediate energies, evidence has been found for unusual cluster disintegration of primary reaction products on a time scale so fast that the proximity of their nuclear reaction partners is felt. Of specific interest are the isotopic regularities seen in the final products which could reflect the isospin dependence of the nuclear tensile strength, i.e., the nuclear equation of state. Even

more exciting is a discovery made by Udo's group at a low bombarding energy. Here, a theoretically long-postulated inability of nuclei to sustain and dissipate the impact of an energetic projectile in a head-on collision may now have been discovered. Observed was a dynamic prompt fission process in Kr+Ca head-on collisions at 10 MeV per nucleon, where the formation of equilibrated compound nuclei is predicted by traditional theory.

Udo lecturing at the 2014 ACS Nuclear Chemistry School at Brookhaven National Laboratory

Radiochemical investigations of transport phenomena of tritium in metals have included thermal desorption and plasma induced sputtering measurements on a series of different materials. Results for metallic samples covered in presumably protective surface films have demonstrated an unexpected complexity of tritium diffusion through lattices and surface layers of various metals. The group's understanding of tritium adhesion to metal films is hoped to help in the future with laser-induced generation of tritium beams for light-ion interactions of interest to studies of stellar fuel cycles. Most recent experiments by the group at the Omega/EP laser system have been successful in producing well-controlled beams of MeV deuterons.

ERIC HENRY (M.S. '10) presented results of his Ph.D. work at the "International Workshop on the Many Facets of EOS and Clustering" in Catania/Italy. Jan Tõke lectured at the International Workshop on Nuclear Dynamics and Thermodynamics (College Station, TX). Udo gave invited lectures at this meeting and at several other international conferences, including the Indianapolis Meeting of the ACS, the international conference "75-years of Nuclear Fission: Present status and future perspectives" (BARC, Mumbay/India), and presented a seminar at the Inter-University Research Centre, New Delhi/India. He also gave a week of lectures at the 2014 ACS Nuclear Chemistry Summer School at Brookhaven National Laboratory.

Udo Schröder, John Huizenga, and Dr. Dieter Hilscher, visiting scientist from Hahn-Meitner Institut Berlin/Germany. (1987)

Douglas H. Turner

Professor of Chemistry

Ph.D. 1972, Columbia University

RESEARCH INTERESTS

Biophysical chemistry: nucleic acid structure and function, prediction of RNA structure from sequence, RNA folding, and design of therapeutics that target influenza RNA.

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The **TURNER** group continues its quest to advance methods for predicting from genome sequences the RNA structures that can be targets for therapeutics. Most therapeutics used clinically target proteins, but only about 5% of the human genome codes for protein. In contrast, more than 75% of the genome codes for RNA. The group's efforts fall into two categories: (1) Understanding the physical interactions that drive RNA folding, and (2) Discovering and targeting RNA structures of influenza.

Doug wrote an invited review of the group's work titled, "Fundamental Interactions in RNA: Questions Answered and Remaining." Recent work trying to answer more questions is focusing on comparing predictions from molecular dynamics (MD) simulations with NMR spectra of oligonucleotide tetramers. **DAVE CONDON (M.S. '11)** , a graduate student, published a paper with **ILYAS YILDIRIM (PHYSICS Ph.D. '08)**, Scott Kennedy, Brendan Mort, and Ryszard Kierzek reporting results on Locked Nucleic Acid (LNA) tetramer, CAAU, which has a methylene bridge locking the sugar in a single conformation. Dave is now writing a paper that includes results for the RNA tetramer, CAAU. Locking the ribose allows the MD to agree better with NMR, which suggests that ribose can be parametrized better in force fields used for predicting 3D structures. The projects illustrate the interdisciplinary approach common in the Turner group. Ilyas used quantum mechanics to parametrize the chi torsion for LNA, Scott provided NMR expertise, Brendan provided computer expertise, and Ryszard synthesized the LNA.

Results on influenza RNA include **SAL PRIORE'S (Ph.D. ' 13)** experimental paper reporting a new hairpin structure that may be important for regulating RNA splicing. An exciting, but very preliminary, result from Ela and Ryszard Kierzek while they visited last summer indicates that targeting the hairpin with oligonucleotides can reduce virus titer by about 30-fold. These experiments were done in the lab of Prof. Luis Martinez-Sobrido in the Department of Microbiology. Sal also published a bioinformatics paper showing that sequences in influenza B are more stably folded than randomized sequences, but not as stable as possible if different codons were used to encode the same proteins. A bioinformatics paper by **INDEE DELA-MOSS (Ph.D. '14)** and **WALTER MOSS (Ph.D. '11)** revealed predicted stable structures at splice sites in influenza B and C, thus allowing comparisons to those published by Walter and Sal in influenza A. Indee graduated and joined Walter in New Haven, where he has an American Cancer Society Fellowship for postdoctoral research with Joan Steitz at Yale. The Cancer Society is making an excellent investment in Walter and RNA.

Statue of Industry in Rush Rhees Library (Brandon Vick)

Graduate students **KYLE BERGER, JON CHEN**, **TIAN**

JIANG (M.S. '11), and **ANDY KAUFFMANN (M.S. '13)** continue to expose the secrets of influenza, including determinations of 3D structures of RNA based on NMR spectra. Tian is collaborating with Luis Martinez-Sobrido to test how site directed mutations in predicted secondary structures affect virus propagation. Luis, Doug, and Steve Dewhurst in Microbiology received a University Research Award to support part of their collaboration.

In news from alumni, **MATT DISNEY (Ph.D. '02)** won the American Chemical Society's David W. Robertson Award for Excellence in Medicinal Chemistry and was promoted to Professor of Chemistry at Scripps. **SUSAN SCHROEDER (Ph.D. '02)** received the Nancy L. Mergler Faculty Mentor Award for Undergraduate Research at the University of Oklahoma. **GREG DEWEY (Ph.D. '79)** accepted an appointment as President of the Albany College of Pharmacy and Health Sciences. On behalf of all the group's graduate students, Doug accepted UR's Doctoral Commencement Award for Lifetime Achievement in Graduate Education. He hopes it does not imply the end of his scientific or biological lifetime.

Doug presented the group's work at the RNA Dynamics Meeting in Telluride, City College of New York (where he once attended a summer program for high school students), the ACS meeting in Indianapolis where Matt Disney received the Eli Lilly Award in Biological Chemistry, the Computational Chemistry Gordon Conference in Vermont, and in Poznan at the 25th Anniversary Celebration of the Institute of Bioorganic Chemistry of the Polish Academy of Sciences.

For the first time, Doug taught his General Chemistry course with lectures starting at 3:25 PM. This assured that both Doug and his students had enough sleep before lecture.

Daniel J. Weix

Associate Professor of Chemistry — Ph.D. 2005, University of California, Berkeley

RESEARCH INTERESTS

Transition-metal catalyzed reactions; synthetic organic chemistry; methods development; study of reaction mechanisms; reductive chemistry; stereoselective transformations.

CONTACT

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Research in **PROFESSOR WEIX'S** group is focused on the development of new, catalytic methods for forming C-C and C-X bonds, with a particular emphasis on understanding mechanism and the use of first-row transition metals. The major focus of the group continues to be the selective cross-coupling of two electrophiles and the use of earth-abundant, first-row metals. Advances this year include the development of co-catalysts that expand the pool of electrophiles to include epoxides (titanium or iodide co-catalysis) and alkyl sulfonate esters (cobalt). This work continues to grow in importance, both in academia (several groups have began working in the area this year) and in industry. Two industrial grants were awarded to the Weix group this year for cross-electrophile coupling: a postdoctoral research grant from Pfizer to support Nick Gower's work on the use of heterocycles in cross-electrophile coupling and an ACS Green Chemistry Institute Pharmaceutical Roundtable grant to investigate the use of greener solvents and reductants. In addition, we have finalized an agreement to work with Merck on some new cross-electrophile coupling chemistry that **JILL CAPUTO (M.S. '13)** has been developing. This past year has been our most productive to date and it seems that nearly everyone is working on a manuscript at the moment!

Daniel began teaching freshman this year in Chemistry 173, Freshman Organic Lab, and he enjoyed working with such a talented, enthusiastic group. In Fall 2014, Daniel switched to the companion lecture for Freshman, Chemistry 171. As a product of the Freshman Organic program at Columbia 18 years ago, Daniel is particularly excited about teaching this course! Daniel will also be ending his run in Chemistry 234, Advanced Laboratory Techniques, after four fun-filled years. The TA job for Chemistry 234 had become a rite of passage for Weix group members. A total of seven have served since 2009: **DANIEL EVERSON (Ph.D.'13)**, **ALEXANDER WOTAL (M.S.'12), LAURA ACKERMAN (M.S.'12)**, **JILL CAPUTO (M.S.'13) KIERRA HUIHUI (M.S.'14), KEITH HILFERDING (M.S.'14)** and **KEYWAN JOHNSON**. Happily, Daniel will be taking over Chemistry 210 in the Spring of 2015, so he will continue to work with our (future) chemistry majors.

The group was fortunate to be recognized with a variety of awards and honors this past year. Recent alumni **JOSEPH BUONOMO (B.S.'13)** was awarded a prestigious NSF Graduate Research Fellowship. **DANIEL A. EVERSON (Ph.D. '13)** won the University of Rochester's 2013-2014 Outstanding Dissertation Award. **RYAN D. RIBSON (B.S.'14)** won the department's ACS Organic Chemistry Award, along with the Carl A. Whiteman, Jr. Teaching Award, and was an honorable mention for the NSF Graduate Research Fellowship Award. **MICHAEL T. ROBO (B.S.'14)** received the John McCreary Memorial Prize at graduation. Both **KEITH HILFERDING** and **KIERRA HUIHUI** received the W. D. Walters Teaching Award, in part for their effort spent teaching CHM 234 lab with Dan Weix. **YANG ZHAO (M.S.' 13)** and **LAURA ACKERMAN** were awarded Elon Huntington Hooker Fellowships from the University for 2014-2015. Fifth-year **ALEXANDER C. WOTAL** won an Arnold Weissberger Fellowship and was also selected for a 1-year co-op with the GlaxoSmithKline Anti-Bacterial team. He overlapped with **LUKIANA ANKA-LUFFORD (M.S.'12)** for a couple of weeks as she finished her internship at GSK and returned to Rochester. Daniel Weix was selected to speak at OMCOS-17 and the Organic Division's Young Investigator Symposium this past summer and was honored to participate in the Kavli Foundation "Frontiers in Science" conference and the NSF SusChem workshop/symposium this past fall. Finally, just this spring, Daniel was selected as a Camille Dreyfus Teacher-Scholar and was promoted to Associate Professor.

The group has finally reached an equilibrium size of about 13 researchers after years of growth. We welcomed 6 new researchers and bid adieu to 6. First-year student **KEYWAN JOHNSON** joined the Weix group last Fall. Keywan was active in undergraduate research with Donald A. Watson at the University of Delaware and is working on macrocyclization. **ZULEMA MELCHOR** spent the summer of 2013 in Rochester as part of the NSF REU program working with

Amalia Weix in regalia

Laura Ackerman. We are thrilled to report that she has returned to Rochester as a Ph.D. student! Zulema has already made a key finding on a new joint project with Todd D. Krauss's lab. Dr. Nick J. Gower joined the Weix group in December to work on our Pfizer collaboration. Nick did his thesis work with Robin Bedford (Univ. of Bristol) and came to Rochester after a successful JSPS postdoctoral stint with Masaharu Nakamura (Univ. Kyoto). Don Batesky joined the group as a Research Associate this past spring. Don brings a wealth of experience in large-scale synthesis and heterocycles from his work with Eastman Chemical, Kodak, and Aldrich. We also welcomed two new undergraduate researchers: Adam B. Haas ('15) and Andrew K. Olsen ('16).

In May, we celebrated the graduation of six group members. Undergraduates **RYAN D. RIBSON (B.S. '14), MICHAEL T. ROBO (B.S. 14)**, and **MATTHEW M. LOVELL (B.A. '14)** all completed their undergraduate degrees in chemistry. Ryan has chosen to work towards his Ph.D. at Caltech; Mike has moved to Ann Arbor, MI, where he will study for his Ph.D. at the University of Michigan; and Matt is applying to medical schools, volunteering in an emergency medicine department in Ohio, and taking some time to visit Ukraine. **MICHAEL R. PRINSELL (Ph.D.'13)** defended his thesis in August and began a teaching postdoc position with Nancy S. Mills at Trinity University (TX) in November. Mike was able to return to Rochester in May for the Ph.D. ceremony, where Dan Weix officially hooded him. **LINGBO DIAO (M.S.'14)** completed his Master's degree in Materials Science as a joint student with Dan Weix and Todd D. Krauss. **SYLVIA CHEN (M.S.'14)** completed her Master's degree in Chemistry. Finally, **DR. SOUMIK BISWAS** left for a well-deserved break before beginning a new position with John A. Gladysz at Texas A&M University in the fall. Congratulations to all of our graduates!

Jill Caputo, Yang Zhao, and Keith Hilferding passed their oral exams and have advanced to candidacy. Third-year students Jill Caputo and Yang Zhao also presented third-year talks on frustrated Lewis pair catalysis and the mechanism of the hydrolytic kinetic resolution of epoxides. Both talks were well delivered. Laura Ackerman again was a class-leader for a group of middle school students in the Horizons summer program at the University of Rochester. Daniel Weix's children, Elliott (9), Madeleine (7), and Amalia (5), continue to keep him and his wife, Stella, busy. They have recently taken up hiking the many parks and trails of Western NY and have found Stony Brook state park to be a particular favorite.

In group alumni news, **JOSEPH A. BUONOMO (B.S.'13)** joined the research group of Courtney Aldrich at the University of Minnesota for his Ph.D. thesis, where he will be working on medicinal chemistry. **RACHEL E. KELEMEN (B.S. '13)** joined the research group of Abhishek Chatterjee at Boston College for her Ph.D. thesis work in chemical biology. **DAVID T. GEORGE (B.S.'13)** joined the group of new faculty member Sergey Pronin at UC-Irvine. After marrying Amit at the beautiful San Franscisco city hall in December, **RUJA SHRESTHA (Ph.D.'12)** finished her postdoc with John Hartwig (Univ. California, Berkeley) in November and moved to a research position at Rennovia, a small catalysis company that develops methods for the conversion of biomass to useful chemicals. **DANIEL A. EVERSON (Ph.D.'13)** finished his postdoc with Chris Douglas (Univ. of Minn.) to take a Visiting Professorship at St. Olaf College. Congratulations and best wishes to all!

The Weix family at Boldt Castle

Publications '13-14

ROBERT K. BOECKMAN, JR.

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The Total Synthesis of (-)-Rasfonin. R.K. Boeckman Jr., K.F. Biegasiewicz, J.E. Pero, D.J. Tusch, J.R. Miller, *J. Org. Chem.*, **2014**, *79* submission anticipated.

KARA L. BREN

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ESTHER CONWELL

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JOSEPH P. DINNOCENZO

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RICHARD EISENBERG

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JAMES M. FARRAR

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RUDI FASAN

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IGNACIO FRANCO

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ALISON J. FRONTIER

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WILLIAM D. JONES

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TODD D. KRAUSS

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DAVID W. MCCAMANT

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JOHN S. MUENTER

Chirped Pulse Millimeter Wave Spectroscopy for Dynamics and Kinetics Studies of Pyrolysis Reactions. K. Prozument, G.B. Park, R.G. Shaver, A.K. Vasiliou, J.M. Oldham, D.E. David, J.S. Muenter, J.F. Stanton, A.G. Suits, G.B. Ellison, R.W. Field, *Phys. Chem. Chem. Phys.*, **2014**, *16*, 15739.

MICHAEL L. NEIDIG

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BRADLEY L. NILSSON

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Selective Suspension of Single-Walled Carbon Nanotubes using beta-Sheet Polypeptides. N.M.B. Cogan, C.J. Bowerman, L.J. Nogaj, B.L. Nilsson, T.D. Krauss, *J. Phys. Chem. C.*, **2014**, *118*, 5935-5944.

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LEWIS J. ROTHBERG

Permanent polarization and charge distribution in organic light-emitting diodes (OLEDs): Insights from near-infared charge-modulation spectroscopy of an operating OLED. A.P. Marchetti, T.L. Haskins, R.H. Young, L.J. Rothberg, *J. Appl. Phys.*, **2014**, *115*(11), Article 114506.

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W. UDO SCHRÖDER

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DOUGLAS H. TURNER

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DANIEL J. WEIX

Substituted 2,2'-bipyridines by nickel-catalysis: 4,4'-di-tert-butyl-2,2'-bipyridine. J.A. Buonomo, D.A. Everson, D.J. Weix, *Synthesis*, **2013**, *45*, 3099-3102.

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Cross-Electrophile Coupling: Principles of Reactivity and Selectivity. D.A. Everson, D.J. Weix, *J. Org. Chem.* **2014**, *79*, 4793-4798.

Aerial View of River Campus

Commencement

Bachelors and Masters Degrees Awarded in Chemistry

2014 BACHELOR OF SCIENCE

Tyler Banker
Kristen Bentley [1]
Kaitlyn Connelly [1]
Sarah Koniski [1]
Peter Krasniak [3†]
Jonathan Nemeth
Mikael Olezeski [2*]
Louis Papa [3†]
Anthony Paschke [1]
Jessamyn Perlmutter [2*]
Ryan Ribson [3†]
Michael Robo [3]
James Shanahan [3†]
Taylor Sodano [1**]
David Stelter
Philip Sutera [3]
Josey Topolski

2014 BACHELOR OF ARTS

Chandra Ade-Browne*
Brian Barker [2]
Gidion Beyene
Shane Borzok [2*]
Zachary Brumberger [2]
Sarah Bugner
Nina Datlof
Nathan Freeman [2**]
Joshua Geiger [3*]
Anisha Gill
Zachariah Hale [3†]
Erin Hayes [1]
Ahsum Khan
Matthew Lovell
Myranda Maynard [2]
Gregory McKay [3†]
Rina Minato [2**]
Hiroko Miyagi [2]
Adriana Natali
Rachel Hee Young Park [3†]
Ian Pershing*
Daniel Petkovich
Eduardo Quinonez Zanabria
Sarah Skinner [2]
Matthew Wilfred [1]

2014 MASTER OF SCIENCE

Amanda Amori
Sylvia Chen
Abby Cryan
Benjamin Dick
Kathlyn Fillman
Leah Frenette
Keith Hilferding
Jeffrey Kehl
Miles Marnell
Katryna Pellingra
Danielle Raymond
Melissa Scharoff
Jennifer Urban
Dan Wu
Lifeng Xiao
Hongmei Yuan

DISTINCTIONS

[1]Distinction [2]High Distinction [3]Highest Distinction
[†]Phi Beta Kappa *Take 5 Scholar (finishing)
**Take 5 Scholar/KEY Program (beginning)

2014 Chemistry Graduates

Autumn on the Genessee River

Doctoral Degrees Awarded in Chemistry

George Arab
Studies Toward the Synthesis of FK-506
Robert K. Boeckman, Jr.

Sarina Bellows
Steric and electronic effects of the beta-diketiminate ligand on low-coordinate iron complexes
Patrick L. Holland

Arielle Butts
Repurposing Triphenylethylene Estrogen Receptor Antagonists as Anticryptococcal Agents
Damian J. Krysan

Lumbini Dela-Moss
Analysis of RNA Secondary Structure: Common Themes in Spliced Segments of Influenza A, B, and C
Douglas H. Turner

Daniel Everson
Nickel-Catalyzed Electrophile Cross-coupling of Aryl Halides with Alkyl Halides
Daniel J. Weix

Zhiji Han
Light-Driven Hydrogen Production from Water Using Noble-Metal-Free Systems
Richard Eisenberg

Jesse Kleingardner
Biological Role and Applications of Covalent Heme Attachment to Polypeptides
Kara L. Bren

James Morris
Experimental and Theoretical Investigations of Strong Bond Activation and Functionalization with Rhodium, Iridium and Platinum
William D. Jones

Michael Prinsell
Nickel-Catalyzed Reductive Coupling of Alkyl, Allyl and Vinyl Electrophiles
Daniel J. Weix

Jason Tubbs
Computational and Experimental Advancesin the RNA Therapeutic Pipeline
Douglas H. Turner

Student Awards

DEPARTMENT AWARDS

Dr. E. W. and Maude V. Flagg Award
Louis Papa

John McCreary Memorial Prize
Michael Robo

ACS Rochester Section Award
Peter Krasniak

ACS Inorganic Chemistry Award
James Shanahan

ACS Organic Chemistry Award
Ryan Ribson

Chemistry Department Award
Joshua Geiger
Zachariah Hale
Gregory McKay
Rachel Hee Young Park
Philip Sutera

COLLEGE AWARDS

Janet Howell Clark Prize
Rachel Hee Young Park

Catherine Block Memorial Fund Prize
Chitavi Maulloo

TEACHING AWARDS

W. D. Walters Teaching Award
Keith Hilferding
Kierra Huihui
Brian Sheldon
Peter Thayer

Carl A. Whiteman, Jr. Teaching Award
Peter Krasniak
Louis Papa
Ryan Ribson
James Shanahan

ENDOWED DEPARTMENT FELLOWSHIPS

Robert & Marian Flaherty DeRight Fellowship
Joshua Kolev
Tian Jiang
Wathsala G.H.M. Liyanage

Moses Passer Fellowship
David Condon

Elon Huntington Hooker Fellowship
Peter Carlsen
Nicole Cogan
John Frost
Yunzhe Jiao
Doug Tusch

Arnold Weissberger Fellowship
Kyle Biegasiewicz
Yekaterina Lyubarskaya
Alexander Wotal

Samuel A. & Ellen F. Lattimore Fellowship
Amanda Amori
Stephanie Daifuku
Banu Kandemir
Kathlyn Fillman
Danielle Raymond
Dan Wu

Robert L. & Mary L. Sproull Fellowship
Jennifer Urban

Agnes M. & George Messersmith Fellowship
Zhiji Han

PHI BETA KAPPA

Zachariah Hale
Peter Krasniak
Gregory McKay
Louis Papa
Rachel Hee Young Park
Ryan Ribson
James Shanahan

Fellows 13-14

Albert Collins Nganou Assonkeng
Prof. McCamant
Technical University, Berlin, Germany, 2012

Alexey Akimov
Prof. Prezhdo
Rice University, Houston, Texas, USA, 2011

Nina Bionda
Prof. Fasan
Florida Atlantic University, USA, 2013

Soumik Biswas
Prof. Weix
State University of New Jersey - Rutgers, USA, 2010

Melanie Bordeaux
Prof. Fasan
l'Ecole Nationale Supérieure de Chimie de Montpellier (ENSCM), France, 2012

Sergiy Bubin
Prof. Prezhdo
University of Arizona, USA, 2006

Sumit Chakraborty
Prof. Jones
University of Cincinnati, USA, 2012

Liping Chen
Prof. Franco
Institute of Chemistry, Chinese Academy of Sciences, China, 2008

Amit Das
Prof. Eisenberg
Indian Institute of Technology, Bombay, India, 2012

Yuming Dong
Nanjing University, P.R. China, 2008

Greg Frattini
Prof. Boeckman
University of Rochester, New York, USA, 2011

Nicholas Gower
University of Bristol, Bristol, UK, 2012

Run Long
Prof. Prezhdo
Shadong University, P.R. China, 2008

Michael Odoi
Prof. Krauss
University of Massachusetts, USA, 2010

Linsen Pei
Prof. Farrar
University of Science and Technology of China, P.R. China, 1999

Ruth Castro Rodrigo
Prof. Jones
University of Zaragoza, Spain, 2010

Sebastian Schaefer
Prof. Krauss
University of Siegen, Germany, 2008

Ritesh Singh
Prof. Fasan
University of Lucknow, India, 2007

William Spencer
Prof. Boeckman
University of Rochester, New York, USA, 2012

Brett Swartz
Prof. Krauss
University of Rochester, New York, USA, 2010

Vikas Tyagi
Prof. Fasan
CSIR-Central Drug Research Institute - Jawahal Lal Nehru University, India, 2013

Francesca Vitali
Prof. Fasan
Universität Zürich, Switzerland; La Sapienza-Università di Roma, Italy, 2003

Linjun Wang
Prof. Eisenberg
Institute of Chemistry, Chinese Academy of Sciences, Beijing, China, 2009

Bo Zheng
Prof. McCamant
Nanjing University, China, 2008

Seminars & Colloquia

AUGUST 2013

Jesse Kleingardner (University of Rochester)
"Biological Role and Applications of Covalent Heme Attachment to Polypeptides" August 13, 2013

Michael Prinsell (University of Rochester)
"Nickel-Catalyzed Reductive Coupling of Alkyl, Allyl and Vinyl Electophiles" August 13, 2013

SEPTEMBER 2013

Professor Claudia Turro (Ohio State University) "Control of Excited States of Transition Metal Complexes for Applications in Solar Energy Conversion and Biology" September 4, 2013

Professor Gong Chen (Pennsylvania State University) "New Palladium-Catalyzed C-H Functionalization Strategies for Organic Synthesis" September 13, 2013

Professor Arindam Chakraborty (Syracuse University) "Investigation of electron-hole interaction in nanoparticles using explicitly correlated wavefunction based methods" September 16, 2013

Professor Mahdi Abu-Omar (Purdue University) "Selective Catalysis for Biomass Conversion" September 18, 2013

Professor Maja Koehn (European Molecular Biology Laboratory - Germany) "Investigation of phosphatases with chemical biology tools" September 20, 2013

Professor Eva Zurek (SUNY Buffalo) "Building a Chemical Intuition Under Pressure : Predictions of Novel Hydrides" September 23, 2013

Professor Daniel Mindiola (University of Pennsylvania) "Titanium Alkylidynes. C-H Bond Activation and Beyond" September 25, 2013

Professor Katherine Willets (University of Texas) "Super-resolution imaging of SERS hot spots" September 30, 2013

OCTOBER 2013

Professor Oleg Ozerov (Texas A&M University) "Reaction Discovery With Pincer Complexes" October 2, 2013

Benjamin Martin (University of Rochester)
"Single Molecule Spectroscopy of MEH-PPV: varying environment to study conformational effects on photo-physics" October 7, 2013

Professor Kent Kirshenbaum (New York University) "Peptoid Foldamers: Form and Function" October 11, 2013

Seymour Rothchild Lecture

Professor Richard Royce Schrock (Massachusetts Institute of Tehnology)
"Olefin Metathesis by Mo and W Complexes. Not Just Chopped Liver" October 16, 2013

Professor Samuel Thomas III (Tufts University) "Controlling Polymer Films with Light" October 18, 2013

Professor Hairong Guan (University of Cincinnati) "Catalysis of Nickel and Iron POCOP-PINCER Complexes" October 21, 2013

Professor Timothy S. Zwier (Purdue University) "Exploring Hydrogen Bonded Networks in Gas phase Peptides, Foldamers, and Water-containing Clusters" October 23, 2013

Professor E. James Petersson (University of Pennsylvania) "Thioamides: Minimalist Chromophores for Monitoring Protein Folding and Stability" October 25, 2013

Professor Michael Tauber (University of California - San Diego) "From feathers to fission: Spectroscopic studies of carotenoids" October 28, 2013

Professor Alan Aspuru-Guzik (Harvard University) "Quantum information tools for theoretical and experimental physical chemistry" October 30, 2013

NOVEMBER 2013

Professor William Dichtel (Cornell University)
"Bottom-up Synthesis of Structurally Precise Organic Materials and Interfaces" November 1, 2013

Professor Christine Payne (Georgia Institute of Technology)
"Nanoparticle-cell interactions: Importance of protein structure" November 4, 2013

Professor Michel Etienne (Universite de Toulouse, Laboratoire de Chimie de Coordination du CNRS)
"From CC agostic interactions to CH bond activation" November 11, 2013

Magomedov Award Lecture

Professor Melanie S. Sanford (University of Michigan, Ann Arbor)
"Recent Advances in Metal-Catalyzed C-H Bond Functionalization" November 14, 2013

Professor Adam Wasserman (Purdue University)
"Partition Density Functional Theory" November 18, 2013

Professor Rudi Fasan (University of Rochester)
"Synthesis and evolution of macrocyclic organo-peptides for selective biomolecular recognition" November 20, 2013

Lumbini Indeewari Dela-Moss (University of Rochester)
"Analysis of RNA Secondary Structure: Common Themes in Spliced Segments of Influenze A, B, and C" November 25, 2013

DECEMBER 2013

Dr. David Leitch (California Institute of Technology)
"Mechanism Driven Development of Catalytic Processes in Organic Synthesis and Energy Science" December 2, 2013

Professor Daniel J. Weix (University of Rochester)
"No More Nucleophiles: Direct, Selective Cross Coupling of Electrophiles" December 4, 2013

Dr. Elliot Hulley (Pacific Northwest National Laboratory)
"Metal-localized vs. Ligand-localized Reactivity: Utilizing Metal-Ligand Cooperativity" December 5, 2013

James C. Morris (University of Rochester)
"Experimental and Theoretical Investigations of Strong Bond Activation and Functionalization with Rhodium, Iridium and Platinum" December 9, 2013

Dr. Timothy Cook (University of Utah)
"Multinuclear Coordination Chemistry: From Molecular Self-Assembly to Solar Energy Conversion" December 9, 2013

W. Albert Noyes Jr. Memorial Lecture

Professor Mark A. Ratner (Northwestern University)

"Molecular Photovoltaics and Electron Transfer" December 10, 2013

"Molecular Mesoscopics: Transport in Molecular Junctions" December 11, 2013

"Controlling Electronic Properties of Molecules by Distortion: Fixing Pathways" December 12, 2013

Arielle Butts (University of Rochester)
"Repurposing Triphenylethylene Estrogen Receptor Antagonists as Anticryptococcal Agents" December 12, 2013

Dr. Dong Wang (University of Princeton)
"From C-H Oxidation to Water Splitting: High-valent Metal-oxo Complexes in Energy-demanding Reactions" December 16, 2013

JANUARY 2014

Dr. Feifei Li (Brookhaven National Laboratory)
"Small Molecule Activation in Bioinorganic Chemistry: From Orbital to Organism" January 6, 2014

Dr. Alexander Spokoyny (Massachusetts Institute of Technology)
"Organomimetic Chemistry of Aromatic Fluorine- and Boron-Rich Molecules" January 13, 2014

Dr. Gopeekrishnan Sreenilayam (SUNY Brockport)
"Configuration-Encoded Iterative Approach to 1,5-Polyols and Synthesis of Bacterial Biofilm killing Antibiotic Carolacton" January 17, 2014

Dr. Alexey Akimov (University of Rochester)
"Quantum dynamics in solar energy materials" January 20, 2014

Medical Scientist Research Symposium

Professor Thomas R. Cech, Nobel Laureate (University of Colorado-Boulder)

"Long Non-coding RNA's and Their Protein Partners" January 23, 2014

"Telomerase in Health and Disease: genomics and the future of medicine" January 24, 2014

Adam Feinberg (University of Rochester)

"Highly Enantioselective Hydrogenation of Quinolines Using Phosphine-Free Chiral Cationic Ruthenium Catalysts" January 24, 2014

Professor Svetlana Kilina (North Dakota State University)

"Theoretical Insights into Covalent and Non-covalent Functionalization of Carbon Nanotubes" January 27, 2014

Zhiji Han (University of Rochester)

"Light-Driven Hydrogen Production from Water Using Noble Metal-Free Systems" January 28, 2014

FEBRUARY 2014

Andrew S. Kende Distinguished Lecture

Professor Justin Du Bois (Stanford University)

"Making Molecules from CH Bonds" February 3, 2014

"Toxins as Targets for Chemical Synthesis" February 4 2014

"Toxins as Tools for Chemical Biology" February 5, 2014

Professor Liviu Mirica (Washington University in St. Louis)

"Organometallic Reactivity of High-Valent Group 10 Transition Metal Complexes" February 10, 2014

Terrell Samoriski (University of Rochester)

"Mechanistic Investigations of chiral VANOL-BOROX catalyzed aziridination reaction" February 14, 2014

Professor Robert Morris (University of Toronto)

"Developing Iron Catalysts for the Efficient Asymmetric Hydrogenation of Ketones and Imines" February 17, 2014

Dr. Susanne Kiau (Bristol-Myers Squibb Pharmaceutical Company)

"Process Chemistry in the Pharmaceutical Industry BMS-803903: Bench Synthesis to Pilot Plant" February 21, 2014

Professor Alison Peterman (University of Rochester)

"Weird theories of matter" February 24, 2014

MARCH 2014

Sarina M. Bellows (University of Rochester)

"Steric and electronic effects of the beta-diketiminate ligand on low-coordinate iron complexes" March 3, 2014

Professor Robin Perutz (University of York - UK)

"Why weak bonds matter: sigma-alkane complexes and halogen bonds to metal complexes" March 5, 2014

Professor Ian Fleming (University of Cambridge - UK)

"Short cuts - A series of interlocking stories, with chemistry, taken from my career" March 6, 2014

Jill Caputo (University of Rochester)

"Catalytic Hydrogenation of Alkynes Using a Frustrated Lewis Pair" March 7, 2014

Victor J. Chambers Memorial Lecture

Professor Stephen Buchwald (Massachusetts Institute of Technology)

"Palladium-Catalyzed Carbon-Heteroatom Bond Formation" March 11, 2014

"Palladium-Catalyzed Carbon-Fluorine Bond Formation" March 12, 2014

"New Methods for the Enantioselective Formation of sp3-Carbon-Heteroatom Bonds" March 13, 2014

Yang Zhao (University of Rochester)

"Mechanistic Basis for High Stereoselectivity and Broad Substrate Scope in the (salen)Co(III)-Catalyzed Hydrolytic Kinetic Resolution" March 14, 2014

Dr. Samit Bhattacharya (Pfizer, Inc.)

"Adventures in Drug Discovery as a Medicinal Chemist" March 21, 2014

Professor Jonas C. Peters (California Institute of Technology)
"Catalytic reduction of nitrogen to ammonia by mononuclear iron complexes" March 26, 2014

Professor Laura Anderson (University of Illinois at Chicago)
"Synthetic Versatility of N-O Bond Rearrangements" March 28, 2014

APRIL 2014

Charles F. Hutchison Memorial Lecture

Professor Yi Lu (University of Illinois at Urbana-Champaign)

"Biosynthetic Inorganic Chemistry and its Applications in Designing Novel Biocatalysts for Alternative Energy" April 1, 2014

"Functional DNA Sensors for On-site and Real-time Environmental Monitoring and Medical Diagnostics" April 2, 2014

"Functional DNA Nanotechnology: Precise Spatial and Dynamic Controls of Nanomaterials with Different Morphologies and their Applications in Imaging and Targeted Drug Delivery" April 3, 2014

Professor Angelique Louie (University of California, Davis)
"Multimodal Molecular Imaging April 7, 2014

Professor Sharon Hammes-Schiffer (University of Illinois at Urbana-Champaign)
"Proton-Coupled Electron Transfer in Catalysis and Energy Conversion" April 9, 2014

Professor Tehshik Yoon (University of Wisconsin - Madison)
"Photocatalysis with Visible Light" April 11, 2014

Professor Celia Goulding (University of California - Irvine)
"Structural insights into mechanisms of bacterial survival" April 14, 2014

Professor Brian McNaughton (Colorado State University)
"Expanding the Functional Utility of Proteins as Research Tools and Therapeutic Leads" April 18, 2014

Professor Seth Herzon (Yale University)
"Target-Driven Total Synthesis" April 25, 2014

Lloyd Munjanja (University of Rochester)
"Mechanistic Studies for Dual Gold Catalyzed Enyne Cycloisomerization" April 28, 2014

Stephanie Daifuku (University of Rochester)
"Insight into In-situ Iron C-C Cross-Coupling Catalysts through Structure, Bonding, and Mechanism" April 28, 2014

Professor Serge Gorelsky (University of Ottawa)
"Opening up the Black Box of Quantum Chemical Calculations: New Insights into Bonding and Reactivity of Transition Metal Complexes" April 30, 2014

MAY 2014

Professor Richard Robinson (Cornell University)
"Chemical and Structural Engineering of Nanomaterials for Energy Applications" May 5, 2014

Banu Kandemir (University of Rochester)
"Hydrogen Evolution from Neutral Water Catalyzed by Cobalt Biosynthetic Catalysts" May 6, 2014

Zhentao Hou (University of Rochester)
"Effects of annealing process on the photoluminescence properties of single-walled carbon nanotubes" May 7, 2014

Rebecca Smith (University of Rochester)
"Applications of Cytochromes c as MRI Contrast Agents and for Solar Fuels" May 7, 2014

Jared Kneebone (University of Rochester)
"Elucidation of In-Situ Speciation and Mechanism in Iron-Catalyzed Sonogashira-type Cross-Coupling Reactions" May 19, 2014

Malik Al-afyouni (University of Rochester)
"Activation of Nitrous Oxide and Carbon Dioxide by a Masked Two-Coordinate Co(I) Complex" May 19, 2014

Professor Amir H. Hoveyda (Boston College)
"The Evolution of Catalytic Olefin Metathesis: From Ancillary Process to Purveyor of Stereochemical Identity" May 21, 2014

Jessica Marie Smith (University of Rochester)
"Macrocyclic Organo-Peptide Hybrids (MOrPHs): Methodology and Application toward the Inhibition of Protein-Protein Interactions" May 27, 2014

Professor Raymond Schaak (The Pennsylvania State University)
"Synthetic Design Tools for Complex Inorganic Solids and Nanostructures" May 28, 2014

Staff News

ADMINISTRATIVE STAFF

The staff enjoyed their annual summer outing on the Sam Patch Tour boat located on the canal in Pittsford on July 23rd despite the heavy downpour and thunder and lightning. We had lunch and enjoyed the scenery as the boat went up and down in the locks.

DEB CONTESTABILE is in her third year with the Chemistry Department as Course Administrator and Undergraduate Program Coordinator. She has moved her office to Hutch 404E, which is behind the chemistry main office. Her responsibilities include undergraduate student advising, serving as a liaison between the registrar's office and the faculty for course scheduling each semester, website updates, as well as coordinating various chemistry events - the largest being the chemistry commencement ceremony. In addition, she is also CLASP certified and will be assisting with pre-grant proposals. Outside of work, Deb and her husband stay busy with their two boys, ages 12 and 17, who both play cello and participate in cross country/track. Her older son is a senior in high school and is deciding where he would like to attend college, with the University of Rochester at the top of his list.

ROBIN COOLEY, our graduate studies coordinator, has now been with the department for ten years. She continues to coordinate the recruitment and admission of new graduate students, as well as assisting current students as they progress through their studies toward the doctoral degree. Each year, Robin organizes the department's main recruitment activity, Visitation Weekend, which always draws many prospective graduate students to Rochester. This past year the attendees were welcomed with a night of fun and games at the Strong Museum of Play hosted by the current graduate students, followed by a full day of activities including tours, faculty talks and socializing. Each fall, Robin also organizes a week long orientation event for all incoming graduate students. For the 2014-2015 school year, we welcomed thirteen new graduate students to the department.

DONNA J. DOLAN is currently beginning her twenty-seventh year in Chemistry serving as departmental secretary. In this role, Donna continues to provide support for purchasing in the Chemistry Business Office while also providing assistance to faculty and managing the chemistry department's main office. In addition, she organizes the departmental distinguished speakers program. Donna continues to enjoy riding her XL883 Harley.

GINA EAGAN joined the department in February as administrative assistant to Professor Lewis Rothberg, chair of the Materials Science program. With the addition of four Ph.D. and eight M.S. students this fall, there are a total of 18 Ph.D. and 20 M.S. students in the program. Some of Gina's responsibilities include explaining the graduate requirements to students and faculty, assisting with course registration and exam scheduling, and working closely with the Graduate Studies office and ISO to submit all of the required documentation. Gina is also responsible for organizing the annual one-day Materials Science Nanosymposium which was held on May 19, 2014. Gina and her family love to participate in outdoor activities during all of the seasons. As a native of Rochester, she encourages her two children to dress for the weather and go outside and have fun!!

LYNDA W. MCGARRY (M.S. '85), completing her fourth year with the department and finishing up her first year as the Development and Alumni Relations Administrator, enjoys working with faculty on preparing grants and awards submissions, as well as organizing alumni and department events. This past fall Lynda and her husband, Dan, became "empty nesters" as they moved their son to SUNY Oswego for his freshman year. Their daughter started her second year at SUNY Albany where she is pursuing a M.S. degree in Public Health. Lynda and her family like to get away to their cottage on Port Bay, a few miles east of Sodus Bay, and go boating in the summer or snowmobiling in the winter.

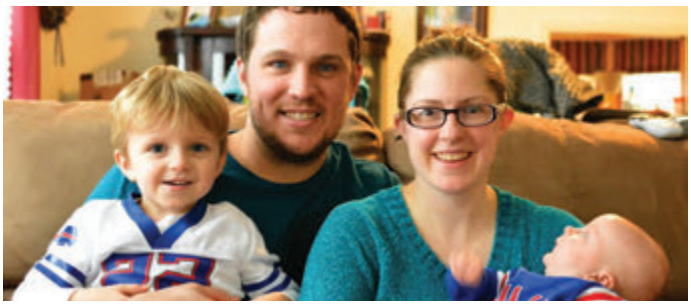
KATE REINHARDT is finishing her second year in the chemistry department. Kate and Elly work together in prepping the undergrad labs as well as shipping and receiving for the department. Kate distributes dry ice and gas cylinders, and is responsible for inspecting the research labs for safety compliance. She is completing her first year at the Simon School of Business Professional Masters in Business Administration Program. Besides taking classes part-time and working in the department, she teaches kick-boxing classes for U of R Intramurals at the River Campus Gym and is involved in both a basketball and kickball league!

KENNETH SIMOLO (PH.D. '85) starts his twenty-seventh year of service to the University of Rochester. Ken has been assistant chair for administration in the Department of Chemistry since 1988. As assistant chair, Ken manages and advances the administrative and financial functions of the department and also serves as the chief safety officer, helping to ensure that chemistry complies with all EPA and OSHA safety regulations. This past year Ken managed the renovations of the Chemistry Department Administrative offices, including the Chair's office.

BARBARA SNAITH completed her third year with us on July 1st as Administrative Assistant to the Chair of the Department. Barb continues to be a great asset to our Department and enjoys her many responsibilities, including organizing faculty recruiting, attending monthly faculty meetings and preparing the discussion minutes. She also manages the immigration paperwork needed for the Department's incoming postdoctoral research associates, many of whom are foreign nationals. In her spare time, Barb enjoys fundraising for Lollypop Farm, and volunteering to fundraise and work on a Habitat for Humanity house. She enjoys going to the GEVA theatre and Rochester Broadway Theatre League plays with her good friends. She is a very active member of her church, chairing fundraisers and women's events. Barb lives in Gates with her adorable white cat named Snowball!

MARGUERITE WESTON, assistant to the faculty, has been with the Department of Chemistry for eighteen years. She coordinates the seminar program by scheduling rooms, contacting speakers to ensure their travel arrangements are in place, obtains their titles and abstracts, and prepares schedules of visits with department faculty, along with producing and advertising the online seminar schedule each month throughout the University community. Marguerite also coordinates select special events, assists with various projects, and provides support to numerous faculty members. She assists Professor Thomas Krugh with the many administrative details of the department's National Science Foundation supported annual summer research program for undergraduates (REU). The program attracts approximately 100 applications each year from undergraduates across the nation and the University of Rochester. Marguerite and husband, Art, are residents of Henrietta, NY, enjoy dancing and gardening, and have 3 sons and five grandchildren (plus 2 cats!).

ELLY YORK, who joined the chemistry department in November of 2006, works part-time prepping for the undergraduate general chemistry laboratories. Elly also assists part-time in the chemistry stockroom. Elly is a graduate of Alfred University and has a Master's degree in education. She also has clinical experience, having previously worked in several veterinary clinics prior to coming to the UR. On July 8th, Elly and her husband, Brandon, celebrated their son Aaron Timothy's third birthday, and on August 21st the newest addition to their family arrived, a second son Caleb Noah!



THE EDITORIAL OFFICES

VALERIE DRAKE began working in December 2013 with Prof. Kara L. Bren as Editorial Assistant with the Journal of the American Chemical Society (JACS), and expects that over 400 manuscripts will be assigned to this office in 2014. She has received plenty of valuable training from Editorial Assistant **VALERIE FITZHUGH**. Valerie Drake received her M.S. in Biology from the University of Rochester, and finds her position as Editorial Assistant to be continually fascinating. Val and her husband, Lee, are both mentors for Penfield High School's FIRST robotics team 1511, "Rolling Thunder." Their son, Calvin (now a senior at USC), was an active member of the team for all four years of high school. The photo shows Val in her robotics team outfit, riding a Segway at a robotics competition.

VALERIE FITZHUGH has been working as an editorial assistant in the Department of Chemistry for almost thirteen years. She served on the journal staff of the Inorganic Chemistry EIC office and the Journal of Organic Chemistry before assuming her current position as Editorial Assistant to Associate Editor William D. Jones for the Journal of the American Chemical Society (JACS) in December 2002. She enjoys the fast pace of the JACS editorial office, and all aspects of processing the 460+ submitted manuscripts to editorial decision and/or production. Val's passion is her family, especially her three grandsons, and she hopes to be retiring in the not too distant future so that she can spend more time with them, and with her ever growing gardens. Pictured are two of her three grandsons, Rowan and Clark, with their cat "Gretzky The Great".

TERRELL SAMORISKI began her tenth year as editorial assistant for The Journal of Organic Chemistry (JOC) this August, 2014. She works closely with Professor Robert K. Boeckman, Jr., associate editor for JOC, and continues to enjoy her work in scientific publishing. Her previous position as structure editor for the Chemical Abstract Service also involved the processing of scientific information. In 2013, the Rochester office handled about 280 manuscripts submitted to the Journal. As a direct result of the contributions of the JOC Editors and staff, the Thomson Reuters Impact Factor for 2013 increased to 4.638 and again set a new standard. Terrell is busy finishing up her Ph.D. degree, making wedding plans for her eldest son who attends UR medical school, and keeping up with her daughter and youngest son in college.

We were sad to say farewell to **MARINA TOKINA,** editorial assistant for her husband, Professor Oleg Prezhdo, for physical and theoretical chemistry journals. They moved to California where Oleg started a new faculty position at USC. A dinner in Marina's honor was held in June at Good Luck Restaurant. We will miss Marina's infectious laugh and her enthusiasm for parties and desserts!

SCIENTIFIC & TECHNICAL STAFF

BILL BRENNESSEL manages the X-ray Crystallographic and CENTC Elemental Analysis facilities. The two techniques are independent and complementary, so when the results from both agree, it is excellent evidence for convincing the broader scientific community that a researcher has synthesized the proposed material. Bill also teaches the graduate course in X-ray crystallography (CHM 416) every spring semester. He works closely with undergraduate students during the X-ray portion of the excellent synthesis and instrumentation course CHM 234. Throughout the year Bill collaborates with various professors from the local colleges, most recently with Professor Bradley Kraft from St. John Fisher College and Professor William Eckenhoff from Hobart and William Smith Colleges.

Bill is very generous with his time and cooking skills as he mans one of the two grills outside Hutchison Hall at lunchtime every Tuesday throughout the year no matter

what the weather brings. We are all grateful to Bill and the entire Tuesday Grill Team of Ted O'Connell and Ray Teng, for providing tasty food at a very reasonable price and always with a smile!

TERRY (TED) O'CONNELL starts his thirty-first year with the chemistry department and still enjoys his position as director of technical operations. He is responsible for new equipment installations and any building renovations. Ted enjoys riding his motorcycle when the weather permits and is also an essential participant of the wildly popular lunch BBQ that occurs outside Hutchison hall every Tuesday at lunchtime throughout the year.

SUE CARDINAL, Chemistry Librarian from the Carlson Library, reports that many print journal volumes and maps were removed from the first floor to make space for the new VISTA Collaboratory. Most online access to journal articles is considered reliable for the long term.
Sue hosted a focus group for ACS ChemWorx which resulted in two graduate students, James Morris and Kyle Rugg, going to Washington, DC to act as consultants.

ERIC LOBENSTINE (PH.D. '81), manager for computers and network, reports another year of pretty smooth sailing for our computers and network, for which he is glad. He continues to represent Chemistry's interests on numerous IT committees within the University, and finds that he routinely advises IT directors on how various IT initiatives will be viewed at the department level - "in the trenches", so to speak. Eric's two sons, Brian and Ethan, are now both employed and sharing a house in Boston.

JALIL SHOJAIE is currently a Sr. lab engineer/chemist who works mornings in the chemistry department and afternoons at the University Laboratory for Laser Energetics (LLE). He has been at the University of Rochester since 1996. He worked as a research chemist in both the obgyn and anesthesiology departments. Prior to coming to Rochester, he worked as a research chemist at NYU, Nelson Institute of Environmental Medicine (1990-95). He has peer-reviewed research publications and patents, with both the University of Rochester and NYU.

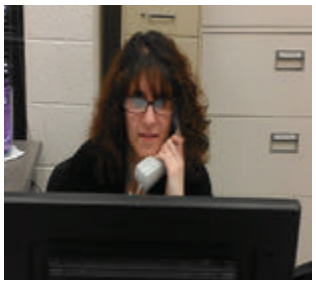
RAY TENG (B.S. '83, M.S. '87, M.B.A. '01) has been with the University since 1987 and joined chemistry in 2004 as research/facility coordinator. Ray brings many years of experience to the department, having previously worked in the Department of Physics and Astronomy, the Nuclear Structure Research Laboratory, and the Department of Earth and Environmental Sciences as senior technical associate. Ray continues to enjoy the daily interactions with faculty and students in addressing research and facilities issues, and he has been very busy with the renovation of the department's administrative offices. Soccer continues to play a big part in Ray's spare time not only as a coach but "making road trips to Johns Hopkins University to watch his daughter play D3 soccer."

THE BUSINESS OFFICE

The Business Office continues to provide service to faculty, staff and students on all financial matters such as payroll, reimbursements, purchases, preparation of grant budgets and monitoring grant expenditures. **DORIS WHEELER**, business office manager since 2002, is very happy to report that the

business office is running smoothly. The business office staff consists of four members with valuable experience. **ANNA KUITEMS** is responsible for reconciling grant ledgers, P-card management and graduate student payroll, and as backup for Randi Shaw. Anna has had the opportunity this year to participate in an Accounts Payable Focus group for the new workday financial system which goes live January 1, 2015. After waiting almost one year, Anna, her family

and especially her son Chris, were excited for the arrival of daughter-in-law, Oksana, from Kazakhstan in late July.



RANDI SHAW, the chemistry accounting bookkeeper, is responsible for billing internal charges, purchase orders, reconciling ledgers, employee reimbursement forms, and processing invoices.

DIANE VISIKO, TAR accounting bookkeeper, continues to work with departmental payroll and is the 'Timekeeper' for HRMS. With her flexible schedule, she is able to spend more time with her nine grandchildren.

PAUL LIBERATORE continues to provide exceptional service as the manager of the chemistry stockroom located in the basement of Hutchison Hall. Paul has been with us for 29 years now.

INSTRUCTIONAL FACULTY

Congratulations to **BENJAMIN HAFENSTEINER** and his wife, Amanda Gorman, on the birth of their beautiful daughter, Scarlett, on September 5, 2014. Ben received his Ph.D. from The Scripps Research Institute in 2008, and proceeded on to a postdoctoral fellowship at UC Irvine in Dr. Larry Overman's group. "Prof. H", as he is called by his students, has been an instructional faculty member for General and Organic Chemistry since 2011, and was chosen by the University of Rochester Student's Association as Professor of the Year in the Natural Sciences in spring 2013, citing his support for the students and his "ability to make any class feel small." Ben was also the recipient of the Salsero award, which is given by the Spanish and Latino Students Association. On the award is engraved "Your passion for education and development makes a positive impact on every life you touch."

Instrumentation

The Chemistry Department at the University of Rochester provides a stimulating work environment and is equipped with a wide variety of sophisticated research instrumentation for spectroscopy, analysis, and computation. All of the departmental instruments are used by students and faculty in a "hands-on" manner; most are available 24 hours a day. The opportunities for student use of major state-of-the-art instrumentation represent one of the special strengths of Chemistry at Rochester. The Department acquires the most up-to-date equipment through instrumentation grants from the National Science Foundation, the National Institutes of Health, and other donors. Many of the Department's instruments are highly specialized and in some cases unique, designed and built on site or substantially modified from commercially available instruments to meet the specific needs of the Department's researchers. Staff members are available to train new users, help with troubleshooting, and offer advice on special problems, but the actual measurements are carried out by the individual researchers and the students they mentor. Students learn the theory and practice of a broad range of instrumental techniques in the course of carrying out their research. Several groups in the Department collaborate with scientists and students at the Laboratory for Laser Energetics, an interdisciplinary facility on the University of Rochester campus which conducts cutting-edge research in ultrafast optics and electronics as well as laser fusion.

NMR Spectrometers:

- Varian 500 MHz NMR Spectrometer
- Brüker 500 MHz NMR Spectrometer
- Two Brüker 400 MHz NMR Spectrometers
- Brüker 300 MHz NMR Spectrometer

Mass Spectrometers:

- Brüker 9.4 Fourier Transform Mass Spectrometer (FTMS)
- Thermo LTQ Velos Ion Trap LC/MS
- Brüker Autoflex III SmartbeamMALDI-TOF
- Shimadzu GC/MS, with AOC-20i autosampler & dual columns, + & - CI
- Shimadzu GC/MS, with Direct Inject Probe, + & - CI
- Shimadzu LC/MS, with APCI & Electrospray ionization sources

Laser Systems:

- Transient absorption systems based on a picosecond Nd:YAG laser and a nanosecond excimer-pumped dye laser
- Picosecond time-correlated single photon counting fluorescence system based on a Nd:YLF-pumped cacity-dumped dye laser
- Nd:YAG/dye laser system
- Associated optical instruments:
  monochromators and spectrographs
  fast multichannel plate photo-detectors
  state-of-the-art, highly sensitive array detectors (CCDs and photodiode arrays)

Other Instruments Include:

- Brüker EMX-Plus EPR spectrometer with 4 K temperature capability
- CEM Explorer Microwave Synthesizer
- ThalesNano H-Cube continuous-flow hydrogenation reactor
- Perkin Elmer 2400 CHN/S Analyzer with VAC Atmospheres (Argon) glove box
- REACT IR; infrared with probes for monitoring and recording spectra over time
- Brüker X-Ray Diffractometer, with Apex II CCD area detector
- Perkin Elmer Lambda 950 UV/VIS Spectrometer
- Perkin Elmer Lambda 35 UV/VIS Spectrometer with Peltier temperature control unit
- Shimadzu 6300 Atomic Absorption Spectrometer
- Five Shimadzu FTIR spectrometers
- Single molecule time-resolved fluorescence confocal microscope
- Thermogravimetric analysis and Differential Scanning Calorimetry for polymer characterization
- Digital Instruments Nanoscope IIa Atomic Force Microscope
- Ellipsometer
- Spectrofluorometer from Roper Scientific, infrared and visible
- Phosphoimager

Organic Chemistry students in lab (J. Adam Fenster)

Departmental Funds

You may also donate online at: www.chem.rochester.edu/alumni/giving.php

The department has established several funds that greatly benefit our departmental activities. Contributions from alumni and friends are the dominant source of income to these funds. If you wish to support the Department of Chemistry, please mark the appropriate box on the form below and send it with your contribution. Donations are tax-deductible; donations of appreciated securities may also carry significant tax advantages. If you wish to donate by credit card, please visit the website above. The chemistry department is grateful for your support.

Chemistry Alumni Research Fund

A general fund that enhances the educational and research activities of the department. The fund enables a number of endeavors, among them the purchase of undergraduate laboratory equipment, assisting graduate students with travel expenses to scientific conferences, and supporting Chemistry's outside speakers program.

Distinguished Lectureship Funds

These lectureship funds are designed to bring scholars distinguished in their field to the department for a series of lectures and to meet with faculty and students.

Victor J. Chambers Memorial Lectureship honors an early chairman of the Department of Chemistry.

Hutchison Memorial Lectureship honors Charles F. Hutchison, Class of 1897, who donated funds for Hutchison Hall.

W. Albert Noyes, Jr. Memorial Lectureship honors Professor Noyes, former chairman of the department, dean of the Graduate School and dean of the College of Arts and Science.

Richard Eisenberg Chemistry Endowment

A new fund to honor the distinguised career contributions of Richard S. Eisenberg, the Tracy H. Harris Professor of Chemistry.

The Chair of Synthetic Organic Chemistry, Honoring Andrew S. Kende

Established in 2006 to honor the distinguished career contributions of C. F. Houghton Professor Emeritus Andrew S. Kende.

Magomedov-Shcherbinina Memorial Fund

Establishes an annual research prize in memory of the Magomedov Family, who were tragically killed in 2006.

Jack A. Kampmeier Fund for Peer-Led Workshop Education in Chemistry

Established in 2005 to honor Professor Kampmeier's 45th year of teaching, this fund supports initiatives that strengthen the Peer-Led Workshop program.

Marshall D. Gates, Jr. Chair in Chemistry Fund

Established in 2002 to honor Marshall D. Gates, this fund helps finance research for the chair holder.

I wish to contribute to the following fund:

_____ Chemistry Alumni Research Fund

_____ Other - Please specify _____

My gift is in honor of _____ (see above)

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Degree Information:

Year degree(s) received from the Department

B.A. _____ **M.S.** _____

B.S. _____ **PH.D.** _____

ADVISOR

_____

Please send your contribution and this form to: Development Administrator, Department of Chemistry, University of Rochester, RC Box 270216, Rochester, NY 14627-0216.

Alumni Update

This form is available online at: www.chem.rochester.edu/alumni/update_contact.php

We would love to hear from you! If your address has changed or if you have an item of interest for the next Newsletter, please fill in the form below and return to:

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Department of Chemistry
RC Box 270216
Rochester, New York 14627-0216

585-275-2915 (phone)
585-276-0205 (fax)
alumni@chem.rochester.edu
www.chem.rochester.edu/alumni

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NAME _____

ADDRESS _____

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Degree Information:

Year degree(s) received from the Department

B.A. _____

B.S. _____

M.S. _____

PH.D. _____

ADVISOR _____

LATEST NEWS _____

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NEWSLETTER COMMENTS _____

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Chemistry Department
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UNIVERSITY of ROCHESTER