

GOESSMANN gazette

A Publication of the Chemistry Department
University of Massachusetts Amherst
www.chem.umass.edu

VOLUME 45 – SPRING/SUMMER 2016

INSIDE

Alumni Reunion	2
Points of Pride.....	4
Lab Notes	5
Seminar Program	20
Dissertation Seminars	21
Senior Awards Dinner	22
Degrees Awarded	22
Research Symposium	23
Friends of Chemistry	26
Letter from Head	28

EVENTS for 2016

Five College Seminar
Prof. Veronica Vaida
University of Colorado
March 24, 2016

Marvin Rausch Lectureship
Prof. Wolfgang Herrmann
Technische Universität München
April 5, 2016

Senior Awards Dinner
April 27, 2016

Alumni Reunion 2016
June 3, 2016

ResearchFest 2016
August 2016

Stein-Covestro Seminar
Prof. Krzysztof Matyjaszewski
Carnegie Mellon University
November 3, 2016

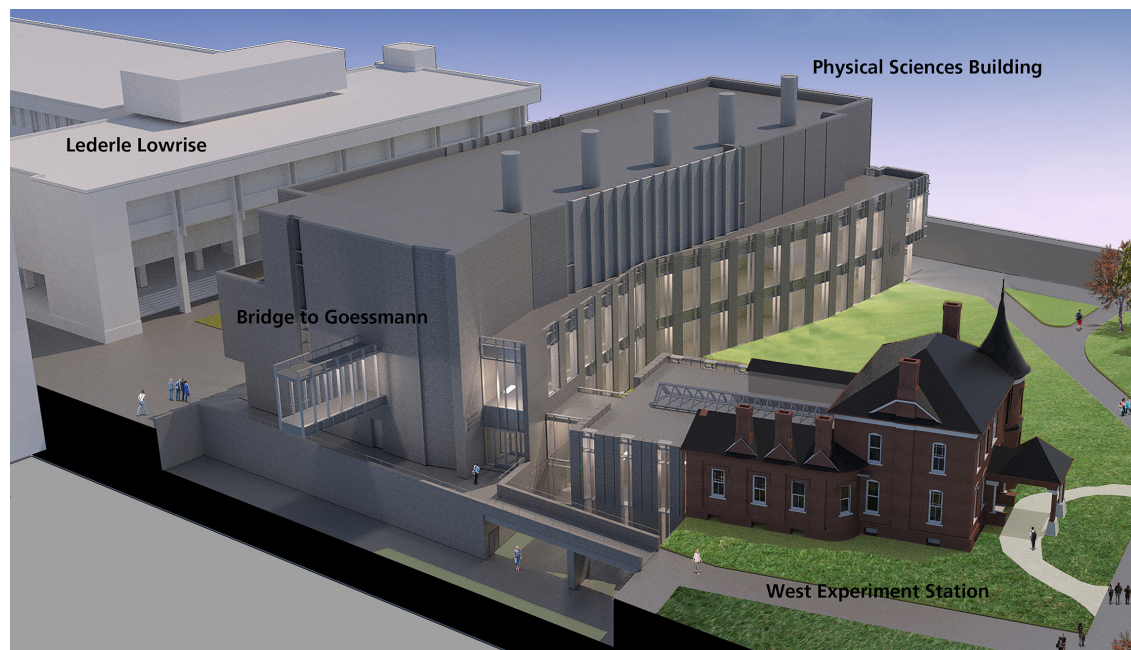
William E. Mahoney Annual Lecture
Prof. Stuart Schreiber
Harvard University
November 10, 2016



University of
Massachusetts
Amherst

CHEMISTRY IS GROWING!

21st Century Labs for 21st Century Research



Construction has begun on the new 80,000 square foot Physical Sciences Building (PSB), which will provide state-of-the-art laboratories for synthetic chemistry on two floors, and specialized, “high-bay” lab space for physics on one. When it is completed in April 2018, the \$100 million project will provide 22,000 square feet of chemistry research labs and support space for 80 graduate students and postdoctoral fellows in 6-8 research groups.

... continued on page 24

“My research program is very interdisciplinary and I’m very excited to have other chemistry colleagues like Thai, DV and future colleagues (hopefully in materials chemistry) nearby. I’m also very much looking forward to the increased spatial overlap with the experimental condensed matter physics groups that will occupy the basement of PSB.”—Prof. Kittilstved



Chemistry Alumni Reunion 2016


The 2016 Chemistry Alumni Reunion was held on Saturday, June 4, 2016 from 1:30 - 4:45 p.m. in the beautiful Integrated Sciences Building (ISB). All alumni, students, faculty, staff, and friends were invited to attend the 2016 Chemistry Alumni Reunion. The university celebrated the Class of 1966 50th Reunion.

1:30-2:30 Reception - ISB Atrium

2:30-3:30 Talks - ISB 221

Presented by featured speakers: Gabriela Weaver, "In the Spotlight: STEM Education and the National Academies;" Raina Kittilstved, "Elementary: Promoting UMass Chemistry Through Forensic Courses and Other Outreach Efforts."

3:30 - 4:45 Reception - ISB Atrium

Check our reunion page for detailed information at <http://www.chem.umass.edu/alumni/reunion.html> 

steinSYMPOSIUM

A symposium was held on Friday, August 21, 2015 to honor Richard S. Stein, Goessmann Professor of Chemistry, Emeritus. Friends, family, colleagues, and alums gathered to celebrate Prof. Stein's 90th birthday. The event was a full day of talks and fellowship, providing a wonderful opportunity to reconnect and reminisce. Over 100 people from all over the world attended the celebration.

The day began with opening remarks given by Chancellor Subbaswamy and Dick Stein. Throughout the day, talks were presented by esteemed speakers: Profs. Brad Bass, Russell Composto, Georges Hadziioannou, Takeji Hashimoto, Benjamin Hsiao, Samuel Krimm, Thein Kyu, Murugappan Muthukumar, Robert E. Prud'homme, Moonhor Ree, Chester Roistacher, Mitsuhiro Shibayama, Yohji Shindo, Mohan Srinivasarao, Garth Wilkes, and Do Y. Yoon, with sessions moderated by Paul Lahti, M. Muthukumar, Hyuk Yu, Dave Hoagland and D. Venkataraman.

At the luncheon, Massachusetts Senate President Stanley Rosenberg presented Prof. Stein with an official Joint House Senate resolution recognizing his many accomplishments and contributions to the Commonwealth. Prof. Stein was also bestowed with birthday gifts, including a special issue of the *Journal of Plastic Film and Sheeting* 31(4) in his honor, with a dedication written by Ananda Chatterjee and a guest editorial by Prof. Stein.



Prof. Stein cutting his 90th birthday cake!

... continued on page 15

alumniREUNION 2015

The 2015 Chemistry Alumni Reunion honoring **Professor Robert M. Weis** was held on Saturday, June 6, 2015 in the Integrated Sciences Building (ISB). **Bob** joined the department in 1988, and was a founding member of the Biological Division in Chemistry. The reunion provided an opportunity to celebrate his life and to reflect about the tremendous impact he made on our department. This event was part of the university-wide Alumni Weekend open to all alumni, students, faculty, staff, and friends.



Professors Earl McWhorter, Elizabeth Connor, Lila Gierasch and husband, John Pylant.

A reception was held in the ISB Atrium, followed by


talks from two of **Bob's** former graduate students. **Dr. Anas Chalah**, Executive Director of Active Learning, Director of Lab Safety Program, School of Engineering and Applied Science, Harvard University, spoke about the impact **Bob** had on his career and his life. **Anas** told several humorous stories that reminded the attendees of the many facets of **Bob**, ranging from his uncompromising scientific rigor to his tremendous warmth.

Dr. Tatiana Besschetnova,

Instructor in Developmental Biology, Harvard School of Dental Medicine, shared her current research on understanding the functional role of an integrin-like receptor in vascular, connective, and bone tissue homeostasis. It was inspiring to see from both talks how training with **Bob** has enabled **Tania** to tackle very complex research and has enabled **Anas** to foster wide-spread use of innovative teaching methodologies.

Over half of our current faculty do research related to understanding biology and developing new approaches to improving human health. These groups exploit tools and approaches from all branches of chemistry. Interdisciplinary work involving chemistry faculty and students is a key ingredient in the successful Chemistry-Biology Interface Training Program, the recent NIH-supported renovations of several floors in LGRT, and the new Institute for Applied Life Sciences, a significant state investment on campus that has led to marvelous new laboratory space and equipment. These developments have a tremendous positive impact on graduate training and research in chemistry.

Bob was at the forefront of what is now a massively successful effort at UMass.

This year's reunion featured a tremendous turn-out of a new generation of alumni, reflecting **Bob's** contributions to training many students in courses, research, and other interactions, both within and beyond his group. It was fabulous to reminisce about times at UMass while learning about the current science and lives (including a number of children in attendance!) of our many successful alumni. 



Drs. Sharon Leitch, Khadine Higgins and Samantha Nicholls.



Professor Scott Garman and Dr. Anas Chalah.



Dr. Tatiana Besschetnova and Prof. Lynmarie Thompson.

POINTS *of* PRIDE in Chemistry

- ❖ **Julian Tyson** was named one of the nine selected Public Engagement Faculty Fellows by the Public Engagement Project.
- ❖ **Richard Vachet** and **S. Thai Thayumanavan** were issued US Patent 8,969,026 B2 entitled, "*Polymeric Reverse Micelles as Selective Extraction Agents and Related Methods of MALDI-MS Analysis.*"
- ❖ **Dhandapani Venkataraman (DV)** received the University's highest teaching honor, the Distinguished Teaching Award.
- ❖ **Stefan Marco Eres** (BA '15 and iCons student) was named a UMass Amherst Alumni Association 21st Century Leader for the class of 2015.
- ❖ **Larry Renna** was one of four finalists for the 2015 East Chemical Student Award in Applied Polymer Science sponsored by the Eastman Chemical Company.
- ❖ **Dhandapani Venkataraman (DV)** was recipient of the Graduate School's second annual Distinguished Graduate Mentor Award.
- ❖ **Tim Gehan** (DV/Lahti groups) was selected as a co-chair for the 2016 Gordon Research Seminar - *Electronic Processes in Organic Materials*.
- ❖ **S. Thai Thayumanavan** was issued US Patent 9,012,584 B2 entitled, "*Organoboronate Nanoparticles and Methods of Using the Same.*"
- ❖ Former chemistry professor and Representative **John W. Olver**, received an honorary degree at Commencement on May 9.
- ❖ **Igor Kaltashov** was issued patent WO2014152678-A1, "*New Substituted Transferrin Receptor Ligand Containing Compounds Used to Treat Bacterial Infection of CNS and Bacterial Meningitis.*"
- ❖ **Tim Gehan** (DV/Lahti groups) and **Narasimha Rao** (Hardy group) have both received Manning Inventor Fellowships for their translational research and entrepreneurship.
- ❖ **Craig Martin** was issued US Patent 9,045,740 B2 entitled, "*Modified T7-Related RNA Polymerases and Methods of Use Thereof.*"
- ❖ **Vincent Rotello** and colleagues received the University of Massachusetts President's Science and Technology Initiative Fund award for a project entitled "*Integrating Physical Sciences and Oncology,*" which represents a unique combination of the physical sciences at Amherst with molecular biology at Worcester to help develop new diagnostics and therapeutics for cancer.
- ❖ **S. Thai Thayumanavan** and colleagues have partnered with Anika Therapeutics, Inc. in a research collaboration to focus on innovative therapy for rheumatoid arthritis.
- ❖ **Kevin Kittilstved** received NSF CAREER award to study quantum dot analogs.
- ❖ **Paul Dubin** was honored with a symposium celebrating his career at Osaka University on June 21, 2015.
- ❖ **Gabriela Weaver** was appointed Professor in Chemistry and Vice Provost for Faculty Development and Director of the Center for Teaching and Faculty Development.
- ❖ **Scott Auerbach** received a new NSF grant on quantum chemistry of biofuels.
- ❖ **Vincent Rotello** is among "the world's leading scientific minds" according to a Reuters survey.
- ❖ **Gabriela Weaver**, Institute for Teaching Excellence & Faculty Development (TEFD), is co-PI on a \$1.5 million STEM Grant shared with the University of Colorado Boulder.
- ❖ **Kevin Kittilstved's** publication, "*Control Over Fe³⁺ Speciation in Colloidal ZnO Nanocrystals,*" was selected for the "*Journal of Materials Chemistry C* 2015 Hot Papers" themed collection.
- ❖ **Dhandapani Venkataraman's** group is on the cover of the September 22 issue of *Macromolecules*.
- ❖ **Richard Stein**, Goessmann Professor of Chemistry, was presented with an official Joint House Senate resolution.
- ❖ **Vincent Rotello** and **Richard Vachet** received a \$400,000 grant from the National Science Foundation to develop new methods to image the stability of nanoparticles in biological tissues.
- ❖ **Libbie Haglin** (Thompson group) was awarded the *Biophysical Journal* Outstanding Student Poster Award at the Biophysics of Proteins at Surfaces: Assembly, Activation, Signaling meeting in Madrid, Spain for her presentation "*Signalling-related Structural Changes of Chemoreceptor Nano-Arrays.*"
- ❖ **Scott Auerbach** attended the 13th annual "NAKFI" conference on November 11-14 at the Beckman Center, University of California, Irvine. NAKFI, which stands for National Academies Keck Futures Initiative, is a collaboration between the National Academies of Science, Engineering, and Medicine, and the Keck Foundation.
- ❖ **Michael Maroney** was named AAAS Fellow.
- ❖ **Scott Auerbach** was one of four faculty chosen to receive a Coleman Fellowship grant from the Berthiaume Center for Entrepreneurship at the Isenberg School of Management for the 2015-16 academic year.
- ❖ **S. Thai Thayumanavan** received a \$6.25 million grant from the US Department of Defense to develop molecular signals.
- ❖ **S. Thai Thayumanavan** received a grant from the Massachusetts Technology Transfer Center Innovation Commercialization Seed Fund grants. 

labNOTES

In the AUERBACH LAB ...

This has been a fantastic year for Prof. Scott Auerbach, his research group, and group alumni. Prof. Auerbach received a new three-year NSF grant (\$330,000) funding his computational chemistry research on biofuel production, entitled: “Predictive Ab Initio Dynamics in Zeolite Biofuel Production Catalysts: Towards More Gas and Less Coke.” This grant supports advanced quantum modeling techniques that will suggest ways to enhance pathways for making gasoline from cellulose while reducing the waste of precious hydrocarbon feedstocks. Auerbach group research on nanoporous zeolite materials hit two milestones this year. First, we published an invited review article with **Prof. Wei Fan** and **Prof. Peter Monson**, both from the UMass Amherst Chemical Engineering Department, in *International Reviews in Physical Chemistry* entitled “Modeling the Assembly of Nanoporous Silica Materials,” detailing our progress towards the holy grail of zeolite science: simulating the crystallization of zeolite nanopores. Second, the Auerbach group published a paper on the best way to model zeolite catalyst clusters, entitled “On the Rational Design of Zeolite Clusters,” featuring our newly minted PhD, **Dr. Angela Miguez**, as the lead author along with undergraduate researcher **Adina Muscat**, our new collaborator from Schrödinger, Inc., **Dr. Woody Sherman**, and corresponding author and former postdoc **Dr. S. (“Vaithee”) Vaitheeswaran**. **Vaithee’s** work on this paper was so impressive that **Dr. Sherman** hired **Vaithee** as an application scientist at Schrödinger, Inc. Also finishing her PhD this year was **Dr. Szu-Chia Chien**, whose dissertation (“Modeling the Self Assembly of Ordered Nanoporous Materials”) accomplished breakthroughs thought impossible by Prof. Auerbach, such as simulating the crystallization of zeolites by developing sophisticated “off lattice” Monte Carlo algorithms. This fantastic year was capped off by Prof. Auerbach delivering an invited lecture entitled “Sipping from the Holy Grail: Simulating the Formation of Zeolites” at the 2015 Gordon Research Conference on Nanoporous Materials in Holderness, NH.

Professor Auerbach remains the founding director of the UMass Integrated Concentration in Science (iCons) Program. This nationally-acclaimed integrative science program for undergraduates is now in its sixth year, after having graduated its second cohort

(the so-called “Second Wave”) in May 2015. This past year, Chemistry **Prof. Justin Fermann** became iCons Co-Director in charge of Academic Affairs, applying his educational brilliance to ensure that the UMass iCons Program provides the best real-world science education in the nation. We have been busy building the iCons Corporate Alliance, bringing new internship and job opportunities to UMass iCons students, and endeavoring to put UMass Amherst on the map as a center of excellence in real-world, interdisciplinary education. For more information on UMass iCons, please see the detailed update on page 18.

Dr. Angela Miguez is now a postdoctoral fellow at Stony Brook University pursuing biophysical calculations of protein structure and function under the guidance of Chemistry **Prof. Carlos Simmerling**. **Prof. Karl Hammond** (Chemical Engineering, Missouri) is spearheading a project on modeling the infrared (IR) and Raman spectra of zeolite frameworks. **Prof. Ateeque Malani** (Chemical Engineering, IIT Bombay) is engaged in a wide array of modeling projects, from understanding fuel cell membranes to the formation of kidney stones.

We wish all present and past members of the Auerbach group a wonderful year, and hope they’ll stay in touch and visit campus whenever possible. Go UMass Crunch Lab!

In the BARNES LAB ...

In the past year, Prof. Mike Barnes continued research supported by the US Department of Energy on “Chemical Microscopy of Conjugated Nanomaterials” with grant support totaling \$420,000 (through 2016), and the Polymer-based MRSEC at UMass Amherst.

Barnes gave invited presentations at Mount Holyoke College, University of Wisconsin, Madison, and the Materials Research Society fall national meeting in Boston, MA. The Barnes group also had a paper published in *Nature Communications* on photo-induced directional charge separation in crystalline organic nanowires.

Our group members and research news:

New group members are **Sarah Marques** (2nd year chemistry), **Hilary Thompson** (2nd year chemistry), and **Peijian Wang** (3rd year physics). **Kathleen Dreher** is an undergraduate (BS ’17) who joined our group last fall.

Joelle Labastide (PhD '15, "Photophysics of Semiconductor Aggregates") is currently a postdoctoral associate working with **Prof. Jenny Ross** in the Physics Department at UMass Amherst.

Mina Bahghar (PhD '14—Physics, "Photophysical and Scanning Probe Studies of Poly-3-Hexylthiophene Nanowires") is a postdoctoral associate in **Prof. Silvera's** group in the Physics Department at Harvard University.

Kevin Early (PhD '10, "Photophysics of Hybrid Quantum Dot-conjugated Organic Nanostructures") is at 3M Corporation in Minneapolis MN where he heads the Quantum Dot Display laboratory.

Michael Odoi (PhD '10, "Time-resolved Single-Molecule Spectroscopy of Semiconductor Quantum Dot-Conjugated Organic Hybrid Nanostructures") leads a product development team at Perkin-Elmer Corp. in Bridgeport, CT.

Austin Cyphersmith (PhD '12, "Probing effects of orientation on the chiroptical properties of single molecules") is now a Microscopy and Imaging Laboratory Manager at University of Illinois-Urbana Champaign.

In the GIERASCH LAB ...

The Gierasch lab has had a busy 2015. Lab members have come and gone throughout the year. We sadly said goodbye to **Weiwei Kuo**, who left her position as postdoctoral researcher (jointly in the Gierasch, **Gershenson** and **Hebert** labs) and took a position as Staff Fellow at the FDA in Detroit, MI. She is enjoying her new life there. MCB graduate student **Kristine Faye Pobre** successfully defended her dissertation

in December and moved to Memphis, TN where she joined **Dr. Linda Hendershot's** lab at St. Jude's Hospital for a postdoctoral stay. We will miss **Weiwei** and **Kristine** very much, and wish them all the best. We are happy that chemistry graduate student **Uma Nudurupati** joined our lab jointly with **Peter Chien's** lab. And, as usual, we had a crew of undergraduate students coming and going: biochemistry major **Nicolas Fandino** left our lab after graduating and receiving an award from the American Institute of Chemists. **Nico** is now working at Brigham and Women's Hospital in Boston. Good luck, **Nico**! New undergraduates in the lab are **Peter Tao**, **Natalie McArthur**, **Chloe McCollum**, and **Todd Morse**; Welcome all! We are enjoying very much having them in the lab pursuing their research projects.

We also enjoyed the company of temporary visitors: **Louise Pinet** from Ecole Normale Supérieure in Paris, France came to do a five month internship; and **Punya Navaratnarajah** from UT Southwestern Medical Center spent two weeks working on FCS with **Anne Gershenson** in the fall. We loved having **Punya** and **Louise** with us.

Several products of the lab's research energy were published including papers in *Biophysical Journal*, *PNAS*, *Cell Reports*, and the *Journal of Molecular Biology*. We are excited by our new understanding of protein folding in the cell and mechanisms of molecular chaperones.

Group members presented their research widely, including major talks that Lila gave: the Frederic Richards seminar at Yale, the Beckman Scholars seminar at the University of Michigan, an invited lecture at the FASEB "Amyloid" meeting in Palm Beach, and many more.

Recently, The American Society for Biochemistry and Molecular Biology announced that Lila will be the next editor-in-chief of the *Journal of Biological Chemistry*, the flagship journal of the Society. We are all very proud of her and sure that she will do a fantastic job.

Lastly, postdoctoral fellow **Abhay Thakur** and his wife **Yamuna** welcomed beautiful baby **Ayan** in December.

We are happy with our busy lab and look forward to another year of great work.



The Gierasch group.



Hardy Lab after kayaking on the Deerfield River – Summer 2015.

In the HARDY LAB ...

This has been a successful and fun year for the Hardy lab. We kicked off the academic year with a lab rafting trip on the Deerfield River. Soon after Bay Serrano received the **William E. McEwen Fellowship Award** for Outstanding Presentation during ResearchFest 2015. This year she also trekked in the Philippine mountains to the elite group who have seen the highly endangered Philippine eagle in the wild. Kevin Dagbay also won the **William E. McEwen Fellowship Award** for outstanding poster presentation at the Chemistry ResearchFest for the third consecutive year. Kevin Dagbay is making great progress on the characterization of the potent and the most selective inhibitor of casp-6 to date. Over the last year Scott Eron has received multiple awards for his enthusiastic presentation style, including a poster award at the joint UMass Amherst/Worcester CBI retreat as well as a distinguished poster award at Researchfest. Scott also published a paper in collaboration with the Thayumanavan group on caspase delivery. Maureen Hill and Derek MacPherson with alumni post-doc Peng Wu published an *ACS Chemical Biology* paper on caspase engineering. Maureen received the **Eugene M. Isenberg Scholarship** to explore the industrial applications of her research and also presented her work at the Synthetic Biology: Engineering, Evolution and Design (SEED) conference. Last summer Derek mentored a student from the National Technical Institute for the Deaf at Rochester Institute of Technology and found it rewarding to mentor

someone who is hard of hearing like himself. At ACS Boston Derek was selected amongst the top 10% of abstracts to present a poster at the Sci-Mix. This year we recruited one new post-doc, Dr. M. P. Narasimha Rao who is supported by a Manning Inventor Post-doctoral fellow to develop caspase-6 inhibitors for the treatment of neurodegeneration. We have also recruited three excellent first year students Yifei Pei, Ishankumar Soni and Francesca Anson, a joint student between the Hardy and Thayumanavan groups. This year two of our undergraduates Alesia Vialichka and Jacob Lytle will graduate in May. Jacob has accepted a job at Waters Corp. and Alesia will join AbbVie. Elizabeth Barrett, a junior will continue to work in the lab next fall after her internship this summer at Shire Pharmaceuticals.

In the JACKSON LAB ...

Our group continues to explore the dynamics of several important gas-surface reactions, with a focus in recent years on understanding methane dissociation on transition metal-based catalysts. This is the rate-limiting step in the steam reforming of natural gas. We have developed quantum mechanical methods that allow us to compute the dissociative sticking probability of methane as a function of the temperature of the metal and the translational energy and vibrational state of the methane. Graduate student Azar Farjamnia has used a similar approach to examine the dissociative chemisorption of water on the surface of metal catalysts, the rate-limiting step in the famous water-gas shift reaction. She is now examining CO₂ dissociation on smooth and stepped Ni surfaces. Graduate student Han Guo has examined the dissociative chemisorption of all of the isotopologues of CH₄ on both Pt(111) and Ni(111) surfaces. Both students have published their work and presented it as posters at last summer's Dynamics at Surfaces Gordon Conference. Prof. Jackson has presented this work at several venues, including invited talks this past summer in San Sebastian and Salamanca, Spain.

In the KALTASHOV LAB ...

2015 was a very busy year in the Kaltashov laboratory, which included publication of three papers, as well as several presentations given by the group members at numerous scientific meetings and conferences. Lola Fatunmbi defended her PhD dissertation and moved to Penn State. Mark Nazzaro graduated in May and moved on to Mersana Pharmaceuticals, where he works alongside two

group's alumni (**Dmitry Gumerov**, PhD '03 and **Alex Johnson**, MS '14). A new graduate student (**Chendi Niu**) joined the group in December 2015.

In the KITTILSTVED LAB ...

2015 was an exciting year in the inorganic materials chemistry lab located in Goessmann. Graduate students **Swamy Pittala**, **Keith Lehuta**, **Dongming Zhou**, **William Harrigan**, and **Fumitoshi Kato** all had a very productive year with three publications that included a Hot Article by **Dongming** that was published in the *Journal of Materials Chemistry C* on the speciation of Fe^{3+} in colloidal ZnO nanocrystals for visible-light photocatalysis and spin-based electronics applications. Other notable efforts include **Swamy Pittala** who was first author of two manuscripts that revealed some interesting mechanistic details regarding metal ion exchange in CdS-based molecular clusters of varying size. This project also received funding for five years through the National Science Foundation Early Career Faculty Development Program (CAREER). The research and outreach efforts that will be supported through the CAREER award were highlighted in a full article in the Hampshire Gazette in August. You can also read about it here: <http://www.chem.umass.edu/news/kittilstvedCAREERAward.html>

Undergraduate **Michael Mortelliti** was graciously supported through a **Bradspies Fellowship** to work over the summer on the molecular cluster project under the supervision of **Swamy Pittala**. **Michael's** summer research was included and a significant part of the story that was published in October in an issue of *Chemical Communications*.

During the Fall, the lab hosted a visiting graduate student, **Eva Belmonte Sanchez** from the Universidad de Almeria. **Eva** spent her time working on a new

organic radical ligand platform with the ultimate goal of binding them to transition metal ions and obtaining strong magnetic exchange couplings.

Kevin was elected to a Councilor position in the American Chemical Society Connecticut Valley Section in late 2014 and began his official duties in that new role at the Spring National Meeting and Exposition of the ACS in Denver. In October Kevin was invited to attend the Innovation for Cool Earth Forum (ICEF) in Tokyo, Japan and also presented an invited talk at the National Institute for Advanced Industrial and Scientific Technologies in Tsukuba. The group is looking forward to building on the success of 2015 in the next year.

In the KNAPP LAB ...

Recent graduates have moved on to new phases of their careers. Recent graduates worked on topics that were focused on the enzymology and chemistry of HIF hydroxylases. **Cristina Martin** (PhD '16) recently completed her studies with the group. **Cornelius Taabazuig** (PhD '14) is pursuing opportunities in the Big Apple. **John Hangasky** (PhD '14) is working as a postdoctoral researcher with **Micheal Marletta** at UC Berkeley. **Meaghan Valliere** (Honors BS '14) is underway at UCLA for graduate school. **Serap Pektas** (PhD '13) is on the faculty of RTEU, Recep Tayyip Erdogan University in Turkey. It makes me proud to see how the graduates have gone on to impact so many places and topics. Congratulations to each of you, and thanks for the many ways that you advanced research within the group.

The NIH grant about HIF hydroxylases was renewed last year, with leading effort from **Vanessa Chaplin** (PhD candidate), **Alex Barbato** (BS '17) and **Michael McKeon** (BS ChemE '17). This next phase of work is moving the group towards research in the areas of protein engineering and the impacts of enzyme activity on cellular responses.

In the LAHTI LAB ...

On 9 June 2015, I retired from service at UMass Amherst, and became professor emeritus. I no longer accept students or projects at UMass, and generally am not to be found here any more. I am very grateful for many wonderful colleagues I have known at UMass, and even more so for the fantastic graduate students, postdoctoral associates, undergraduates, and visiting scholars who gave so much to the richness of my research group. I am particularly grateful to the departmental and university staff, past



Kittilstved group winter Raclette Party 2015

and present, who have kept the place running, and enabled me to do the things I wanted to do. The Chemistry Department, and many people outside the department, have made kind wishes to me for my future. I am glad I saw many friends at the departmental farewell party that I shared with **Ed Voigtman** and **Margaret MacDonald** in November 2015. I will always treasure the special gift presented to me, and the remembrance book with kind wishes from so many good people.

I have a lot of memories, cards, notes, photos from many people. I could write a lot of words to try to express what I feel and have felt through the years. They would not be enough, so better I be brief. Thank you. Live long and prosper.

In the **MARONEY LAB** ...

News from the Maroney group includes that **Julius Campeciño** successfully defended last summer and received his PhD in September for his work on nickel-dependent superoxide dismutase that was funded by the NSF. Most of the work described in his dissertation appears in:

J. O. Campeciño, L. W. Dudycz, D. Tumelty, V. Berg, D. E. Cabelli, M. J. Maroney, "A Semi-synthetic Strategy Leads to Alteration of the Backbone Amidate Ligand in the NiSOD Active Site," *J. Am. Chem. Soc.* 2015, 137 (28), pp 9044–9052 <http://dx.doi.org/10.1021/jacs.5b03629>.

Julius is now teaching in the Department of Chemistry, Mindanao State University - Iligan Institute of Technology, in the Philippines.

In addition to a newly minted PhD, **Carolyn Carr**, **Heidi Hu**, and **Hsin-Ting Huang** attended the Bioinorganic Chemistry Gordon Research Symposium in Ventura, California last January, where **Carolyn** gave an invited lecture on her work on the RcnR transcriptional regulator, a part of the nickel-trafficking project (NIH). The Maroney group was out in strength for the ACS National Meeting in Boston last August, having five posters in the Biological Chemistry Division program. The group received several small grants (two CBI travel grants [**Carr** and **Hu**], two chemistry department travel grants [**Carr** and **Huang**], an MCB travel grant [**Hu**] and a Graduate School travel grant [**Huang**]) that really made a difference. These grants enabled attendance at the GRS meeting and **Heidi's** travel to the protein-protein interaction conference



Maroney Awarded AAAS Fellow

Michael J. Maroney was awarded the distinction of Fellow from The American Association for the Advancement of Science (AAAS) "for his efforts toward advancing science applications that are deemed scientifically or socially distinguished." He was recognized for his "pioneering work in understanding nickel bioinorganic chemistry, with applications to bioenergy science, bacterial pathogenesis and transition metal homeostasis." Mike received an official certificate and a gold and blue rosette pin in February at the AAAS Fellows Forum during the 2016 annual meeting in Washington, D.C. The tradition of AAAS fellows began in 1874.

in Boston last October. The group also had two dissertation grants from the Graduate School (**Carr** and **Hu**). The Maroney group is looking forward to another productive year with more publications and graduations on the horizon.

In the **MARTIN LAB** ...

The Martin group has launched a new NSF-funded initiative aimed at understanding complex folding pathways in large, structured RNAs. Recent developments have revealed that RNA plays key (and previously unappreciated) roles in cellular regulation and catalysis, and adopts complex folded structures. In a large class of "riboswitch" RNAs, site-specific pauses in transcription are essential for correct function. In particular, it is proposed that targeted pausing of relatively fast RNA polymerization is required to allow time for the folding of the binding site and binding of the sensed ligand. As with the Martin lab's earlier work in transcription, the key to function is relative kinetics of complex processes.

Using tools from the emerging field of DNA nanotechnology, the Martin lab is developing an approach to mimic this sequential folding of RNA in the test tube, but in a precisely controllable manner. Using fluorescent reporters, we can follow folding in real time. **Elvan Cavaç** is using molecular beacons, while **Yasaman Gholamalipour** is using RNAs that bind small molecules to turn on their fluorescence.

The development of this system has also prompted a new direction for the lab. As end-users of RNA polymerase, we have become at times frustrated with sequence-specific “side reactions” in transcription. Consequently, **Aruni Karunanayake Mudiyanse** is now developing a second new thrust, exploiting state of the art “deep sequencing” technologies, combined with combinatorial libraries of a million or more sequences, aimed at fully understanding the sequence dependencies of the already industry work-horse T7 RNA polymerase. More on that next year.

In the METZ LAB ...

The Metz group continues to study structure and bonding in gas-phase metal ion complexes and to explore their photodissociation dynamics, supported by a new NSF grant. Graduate students **Chris Copeland** and **Muhammad Affawn Ashraf**, along with undergraduates **Emily Boyle** (BS '17), and **Augustina Amoako** (BS '18) are studying the initial step in C-H bond activation by transition metal cluster ions. By measuring vibrational spectra of $\text{Fe}_3^+(\text{CH}_4)_n$ and $\text{Ni}_2^+(\text{CH}_4)_n$ they determine the extent to which binding to the metal weakens the C-H bonds in methane. This extends work done by our group on C-H bond activation by atomic metal ions and iron dimer. Graduate student **Dave Johnston** and undergraduates **Matt Gentry** (BS '17), **Kati Johnson** (BS '18) and **Allison Coutu** (BS '18) are using our photofragment imaging instrument to study bonding in small, metal-containing ions such as MnO^+ . By measuring the amount and direction of the kinetic energy released when ions photodissociate, this instrument allows us to measure bond strengths and study photodissociation dynamics. In the UV, MnO^+ photodissociates to form ground state Mn^+ and O; at shorter wavelengths electronically excited Mn^{+*} is the major product. By measuring kinetic energy release to these two channels, they determined that Mn^{+*} is produced at its thermodynamic threshold and they measured the $\text{Mn}^+\text{-O}$ bond strength, resolving a long-standing controversy. It was great to see **Fernando Aguirre** (PhD '01, now at Fresenius Medical Care),

who stopped by for a brief visit, and we welcome any lab alums in the area to stop by!

In the ROTELLO LAB ...

2015 featured comings, goings and many other happenings in the Rotello Lab. Vince was named a Highly Cited Researcher and also recognized as one of “the world’s leading scientific minds” by Thomson Reuters. He has also been named a 2016 recipient of the **RCSA’s TREE Award** (Transformational Research and Excellence in Education) by a committee of senior Cottrell Scholars and members of the RCSA scientific staff. Vince finished his second year as Editor-in-Chief of *Bioconjugate Chemistry*, with **Ngoc Le** continuing to run the social media website (“like” us at <https://www.facebook.com/bioconjugatechemistry>).

Three group members won prizes at the 2015 ResearchFest. Congratulations to **Joseph Hardie** and **Gülen Yesilbag Tonga** for their **William E. McEwen Fellowship Awards** for Outstanding Posters and also **Rubul Mout** for his **Marvin D. Rausch Scholarship Award** for Outstanding Presentation. In addition, **Ying Jiang** won the outstanding student poster award during the 250th ACS national meeting in Boston and **Ngoc Le** won the **Eugene M. Isenberg Scholar Award** for the 2015 academic year. To inspire upcoming generations, our lab members **Rubul Mout**, **Li-Sheng Wang**, and **Ryan Landis** had LabTV interviews (<http://www.labtv.com/Home/Channels?instituteId=2080>).

Thanks to hard work and innovation, four patents have been submitted to the technology transfer office. The first two, led by **Ryan Landis**, involved designing polymeric nanocapsules for the intracellular delivery of therapeutic proteins and polymeric nanocomposites for the treatment of biofilms. **Rubul Mout** paved the way towards designing nanoparticle-protein self-assemblies for intracellular delivery of the CRISPR/Cas9 Gene Editing System. Finally, **Ying**



The Rotello group.

Jiang developed nanoparticle nanocapsules for the intracellular delivery of siRNA.

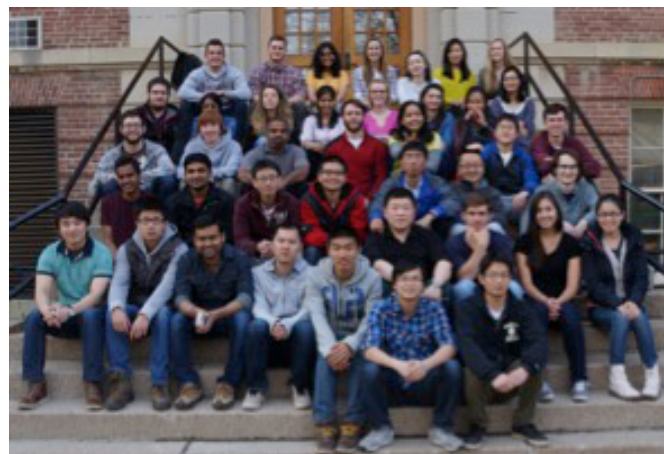
On the departure side, **Daniel F. Moyano**, **Brian Creran**, and **Bradley Duncan** received their PhDs, with **Daniel** heading to PPG Industries, **Brian** off to Markem-Image and **Brad** to Wikifoods. Postdoctoral researchers **Dr. Tsukasa Mizuhara** and **Dr. Young-Kwan Kim** have left the group with **Tsukasa** off to PartiKula LLC, Florida and **Young-Kwan** going to KIST Korea in South Korea. Visiting scholars **Dr. Rajesh Ramanathan**, **Thimon Schwaebel**, **Dr. Li Wang**, **Long Bai**, **Shuaidong Huo**, **Brice Couillaud**, **Bianka Golba**, **Alexis Bordet**, **Ali Akbari**, **Fanny Ariza**, **Dr. Wenbing Shi**, **Dr. Eunhee Jeung**, **Roxane Ridolfo**, **Dr. Neveen Mohamed**, **Arafeh Bigdeli**, **Dr. Sarawut Cheunkar**, **Mahin Bayat**, and **Attasith Parnsubsakul** have returned home. We have had a strong influx of new faces including **Cheng-Hsuan (Ian) Li** who has officially joined our group as a graduate student, **Dr. Tatsuyuki Yoshii** and **Dr. Somrita Mondal** as postdoctoral researchers and **Dr. Ruijin Yu**, **Dr. Junbo Li**, **Dr. Aiping Fan**, **Dr. Feng Zheng**, **Martin Schnurr**, **Dr. Yonghua Xiong**, **Yanwei Ji**, **Xiang Luo**, **Shazia Mumtaz**, **Zill E Huma**, **Jessica Fernanda Affonso de Oliveira**, **Maiara Emer**, and **Dr. Bo Feng** all joining as visiting scholars. Welcome to the group! Our previous group visitor, **Prem** (**Prem**) **Puangploy** from Thailand, received his PhD degree from King Mongkut's University of Technology Thonburi this year. Also, **Arafeh Bigdeli** from Tehran, Iran received her PhD degree from Sharif University of Technology. Congratulations again!

Publications continued apace, with 41 in 2015. These publications are making an impact, with over 2700 citations last year, and Vince hitting an h of 78. Industrial collaboration featured strongly in the group, with funding from GE, Firmenich, and Flexcon.

For up-to-date news, please check out <http://www.umass.edu/rotellogroup/> or see what's up on our less formal Facebook page <https://www.facebook.com/rotellogroup>.

In the THAYUMANAVAN LAB ...

The Thayumanavan group has been as busy as ever during the past year. Please visit our website at <https://elements.chem.umass.edu/thaigroup/> for more on our news and achievements. Also follow our group on Facebook or Twitter (links provided in our website). If you are a group alum and we do not have your



The Thayumanavan group.

updated whereabouts, please let us know. Below, we are listing a few of the highlights of the past year.

New graduate students **Kingshuk Dutta**, **Thameez Koyasseril** and **Francesca Anson** joined the group. **Francesca** will split her time between the Thayumanvan and **Hardy** groups. The group also welcomed **Ziwen Jiang** and **Arash Manafirad**, both of whom were already students in the department. **Arash** is a joint student with the Thayumanavan group and the **Dinsmore** group in physics.

Current graduate student **Priyaa Prasad** completed an internship from July through December at Genzyme in the Boston Area. Graduate students **Joy He** and **Bin Liu** have a new baby son, **Ivan**. **Celia Frieler** has married PSE grad student, **Pat Homyak** and now goes by the name of **Celia Homyak**.

The following graduate students received their degrees this past year: **Dr. Longyu Li**, who is currently a postdoctoral researcher in the **Yaghi** research group at UC Berkeley; **Dr. Krishna Reddy Raghupathi**, who is now a senior scientist at PepsiCo in NY and has a new baby daughter, **Dhathri**; and **Dr. Jiaming Zhuang**, who has continued here in the lab as a senior post-doctoral associate after his graduation.

There are some updates from our graduate student alumni as well. **Dr. Malar Azagarsamy** is now a research scientist at Partikula in Florida. **Dr. Jing Guo** is now working in IBM in Albany, NY and has a new son, **Aiden**. **Dr. Bhooshan Popere** has just accepted a position at Dow Electronic Materials in Marlborough, MA.

We welcomed **Dr. Subramani Swaminathan**, from the University of Maryland Baltimore County, to

the group as a post doc in July. One of our post doc alums, **Dr. Mijanur Rahaman Molla**, is now the Alexander von Humboldt Fellow at Karlsruhe Institute of Technology in Germany.

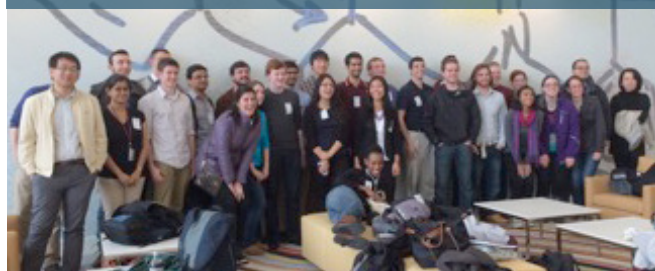
Visiting scholars, **Pingsheng Huang** and **Ding Hu** both returned to China to complete their graduate work. **Albane Birault**, from France, completed an internship here beginning in April with support from her home institution (ENSCBP) and returned in September to France to continue her work towards a PhD. This year, we welcomed **Ya Zuo** to the group, who joined in June with support from the China Scholarship Council, and **Dr. Hatice Seçinti**, who arrived in November, with the support of the Scientific and Technological Research Council of Turkey (TUBITAK). Former visiting scholar **Cunfeng Song** received her PhD from Xiamen University and plans to remain there as a post doc.

Undergraduates this past year included some familiar researchers and some new ones: **Matthew Caissy**, **Daniel Estabrook**, **Margareta Ianosi-Irimie**, **Bailey Ingalls** and **Lauren Okamoto**. We said goodbye to graduating undergrads **Kevin Byrne**, **Sean Byrnes**, and **Matthew Richard**. **Kevin** is now working as a chemist at Cambridge Isotope Laboratories, Inc. **Matthew** is now working at Beth Israel Deaconess Medical Center. High school student **Zoya Fan** is now an undergraduate student at MIT.

The US Department of Defense (DoD) awarded Thai a five-year, \$6.25 million MURI (Multi-University Research Initiative) grant. The award will focus on the development of new algorithms and identifying pathways involved in a molecular detection and signaling process. The exciting part of the grant was the collaboration with five other chemists, physicists and chemical engineers from the University of Chicago, the University of California San Diego, the University of Wisconsin Madison and here at the University of Massachusetts Amherst.

Finally, Thai was awarded the Chemical Research Society of India's (CRSI) Medal at a ceremony during the organization's annual meeting at Punjab University in Chandigarh, India on February 4, 2016. The medal is given for outstanding contribution to the chemical sciences by scientists of Indian origin working outside of the country. He was recognized for his contributions to the area of supramolecular chemistry and nanomaterials. Stay in touch with us through frequent visits to the group webpage, liking

CBI Training Grant Successfully Renewed!



We have just learned that the NIH Training grant supporting our Chemistry Biology Interface program has been renewed for another five years. There are currently 29 CBI programs nationwide (the only other CBI program in Massachusetts is at Harvard) and UMass has one of the longest running CBI programs (since 1995). Our 28 CBI faculty and 60+ CBI graduate students participate in a broad range of CBI activities that enhance training and collaboration, and prepare our students for careers in life-science-related fields. CBI activities also benefit our undergraduates: CBI developed a Drug Design course that is now also quite popular with senior undergraduates and features a field trip to Vertex Pharmaceuticals (photo above). With the major state investment in life sciences at UMass, including new instruments and laboratories in multiple buildings, it is a fabulous time for the CBI Program to continue its mission of connecting research groups from chemistry and biology disciplines for the exchange of expertise and ideas.

us on Facebook, following us on Twitter, and emailing the group!!

In the THOMPSON LAB ...

In the Thompson lab we are very happily and productively taking advantage of new instrumentation, including a Bruker 600 MHz solids/solution NMR spectrometer and a Waters Synapt mass spectrometer, to investigate structure and dynamics of bacterial chemoreceptor nanoarrays. This new instrumentation is part of the recent state investment in the new Institute for Applied Life Sciences (IALS), making it an exciting time to do research at UMass!

We congratulate graduate student **Libbie Haglin**, who attended the "Biophysics of Proteins at Surfaces" meeting in Madrid, Spain and was awarded the Biophysical Society Award for Outstanding Student Poster! Graduate student **Maryam Kashefi** was

selected to attend the US-Canada Winterschool on Biomolecular Solid-State NMR, where she also presented a poster on her work. Congratulations and a fond farewell to undergraduates **Pratichi Mishra** and **Meaghan Molloy**, who completed their honors research projects and their degrees in May. **Pratichi** is now a medical student at St. George's University in Grenada. **Meaghan** is now a research study assistant at Boston Children's Hospital. Last summer we welcomed **Cheyenne Hakes** from SUNY Cortland, who joined us as part of the CURE summer undergraduate research program. **Cheyenne** worked on ABC transporters of interest for biofuel production, a collaborative project with **Jeff Blanchard's** group. Congratulations to undergraduate **Karen Li** who was awarded a Commonwealth College Honors Research Grant for work on this project in Spring 2016.

Lynmarie continues to direct the NIH-funded Chemistry-Biology Interface Training Program (CBI, <http://www.umass.edu/cbi/>) and to co-direct the Postbaccalaureate Research Education Program (PREP, <http://www.umass.edu/prep/>). She has also been involved in several meeting-related activities. She was selected to chair the Meeting Review Committee for the 2015 Bacterial Locomotion and Sensory Transduction conference (BLAST), and she was elected co-chair of the upcoming FASEB meeting on Molecular Biophysics of Membranes. She also presented the lab's work on hydrogen exchange probing functional dynamics of chemoreceptor arrays at a new Gordon Conference on Membrane Protein Folding.

In the TYSON LAB ...

In the spring semester, undergraduates **Harry Lu**, **Cassandra Martin**, **Jem Sibbick**, and **Manas Sarma** were joined by **Alyssa Gordon-Ross**. **Harry** continued his work on the development of our "kitchen" method for the determination of arsenic compounds in rice, **Cassandra** and **Jeb** starting on developing a method for the determination of the arsenic compounds in single rice grain, **Manas** continue his calculations on various t-test scenarios, and **Alyssa** picked up a project from our collaboration with Chemists Without Borders (<http://www.chemistswithoutborders.org/>), who want to develop a (much) cheaper version of the Hach test kit for the determination of arsenic in groundwater that can be deployed in a project in Bangladesh involving college students working with high-school students. This collaboration and related activities at UMass are

described in an article in the *International Journal of Environmental Monitoring and Analysis* (<http://article.sciencepublishinggroup.com/pdf/10.11648/j.ijema.s.2015030301.16.pdf>), and were featured in an invited lecture by Prof. Tyson at the 2015 SCIX Conference in Providence, RI. As a Public Engagement Fellow (<https://www.umass.edu/pepf/>), Prof. Tyson was trained in how to interact with the media and spent time in the UMass TV studio, though his biggest impact was with a piece published in The Conversation, (<https://theconversation.com/are-we-eating-too-much-arsenic-we-need-better-tests-to-know-40732>), which has, as of February 2016, been read 47,000 times. The Hach test kit development was also studied by groups in the arsenic project, in which 18 students (six groups) participated. Prof. **Hans Mentzen** (PhD '06) was also involved. During the summer, the project was continued by a visiting undergraduate from Grinnell, **Lucas Verrastro**, who lives locally and wanted to get some analytical chemistry research experience. Also working in the lab for a few weeks in the summer were **Andrew Patari** (chemistry teacher at Four Rivers Charter School in Greenfield, whose students had also been working on aspects of the Hach test kit in the spring) and **Tiffany Berg** (PhD '12), who helped with the atomic fluorescence procedure for arsenic in rice. Prof. Tyson gave an invited lecture at the International Conference on Analytical Sciences and Spectroscopy in Halifax Nova Scotia, in which he urged labs that have the capability to analyze individual rice grains. In the fall, we were delighted to have **Richmond Ampiah-Bonney** (PhD '06) as a regular visitor from Amherst College, to join **Harry** and work on the dialysis separation of rice starch and arsenic compounds. We welcomed new undergraduate students **Anton El Khoury** and **Thanh Mai**. **Cassandra** and **Jem**, continuing to work together, obtained results to show that some rice grains contain a much higher concentration of arsenic than others from the same bag. **Alyssa** and **Anton** devised a method for the determination of arsenic species by graphite furnace atomic absorption spectrometry as a first step in the hunt for the volatile arsenic compound that is lost when rice is heated. **Thanh** studied several possible methods for extracting arsenic compounds from rice with hot water. Sadly, the CHEM 726 course could not be sustained with visiting speakers, but it was good to see **Chris Hanna** (PhD '93), who did visit and gave a great seminar. Through the Public Engagement Project, Prof. Tyson made contact with staff at the Museum of Science in Boston, with whom he wrote an NSF proposal for a citizen-science project that would be based both in Springfield and Boston.

Although he is retiring in May 2016, he plans to continue working with undergraduate students and on some public engagement projects.

In the VACHET LAB ...

Research in Vachet group continued in the areas of (i) amyloid fibril formation of β -2-microglobulin; (ii) new mass spectrometric tools for detecting nanoparticles in cells and tissues; and (iii) biomarker detection by mass spectrometry. We published six papers on these topics in 2015, and Prof. Vachet and his group made almost 20 presentations at various conferences, meetings, and universities. We also began a new collaboration with Photonis USA, which is located in Sturbridge, MA, to develop a new ICP-MS detector. In addition, the company QuarryBio is licensing technology from the lab and is using it to assess the folding quality of protein therapeutics.

In other group news, we said good-bye to Nick Borotto and Singyuk Hou. Nick successfully defended his PhD in October and is currently doing a postdoc at the University of Michigan with Kristina Håkansson. Nick's love of practical jokes will be missed (maybe. . .). Hou finished her Master's degree during the summer and has enrolled in a chemical engineering graduate program at the University of Maryland. Long-time undergraduate researchers Cara D'Amico and Alexandra Bare also graduated in May. Cara began grad school in biochemistry at the University of Michigan, and Alex is working as an analytical technician at Ocean Spray.

We also welcomed two new members to the lab: Kristen Sikora and Patanachai "Kong" Limpikirati. Kristen is expanding our work on nanoparticle imaging by mass spectrometry, and Kong has a fellowship from the government of Thailand and is developing some new mass spectrometry-based approaches to assess the three-dimensional structure of protein therapeutics.

In alumni news, several former graduate students transitioned to new positions. Michelle Herrmann (MS '00) started a new position at the Food and Drug Administration after many years at the National Institutes of Health; Juma Bridgewater (PhD '06) took a new position at Bristol-Myers Squibb, and is now the analytical lead on the product Orenicia®; and Jia Dong (PhD '13) moved to Johnson & Johnson in Philadelphia (and also got married!). In other news, Shaynah Browne (MS '11) recently passed her Clinical License exam, which will now allow her to do

more in her position at the Albert Einstein College of Medicine.

In the VENKATARAMAN LAB ...

The DV Group had a great year in terms of research and recognition. DV received the 2015 *University Distinguished Teaching Award* and the *University Distinguished Mentor Award*. A heartfelt thanks to all of you! Tim Gehan (PhD '05) was selected as a co-chair of the 2016 Gordon Research Seminar on Electronic Materials. Tim also received the 2015 *Manning Fellowship*, which allows him to focus on fabricating prototypes of organic photovoltaic devices from aqueous dispersions. Larry Renna was named as a finalist for the 2015 *ACS Eastman Chemical Award* for his work on nanoparticle assemblies and methods to study disordered assemblies. Larry also named as a 2015 *Eugene M. Isenberg Scholar*. Larry and Christie, who joined the DV group in 2015, won *William E. McEwen Fellowship Award* for outstanding posters. Marco Eres (BS '15) was named as a *21st Century Leader* for the class of 2015 and a speaker at the CNS commencement for chemistry. Gautam Satishchandran was named as speaker for the CNS commencement for physics. Dana Algaier and Tim Gehan successfully defended their PhD dissertations. The DV group had productive year in terms of publications. A perspective on Nanoparticle



Assemblies was featured on the cover of *Macromolecules*. A collaborative work with Prof. Paul Lahti was featured on the cover of the *Journal of Polymer Science: Polymer Physics*. The DV group's paper on the "Kinetics of Ion Transport in Perovskite Active Layers

and Its Implications for Active Layer Stability" (DOI:10.1021/jacs.5b08535) provided key insights on the role ion movement and method to improve the stability of these important active layers. Seung Pyo and Connor Boyle showed that end-capped with hexabenzocoronene bind strong to carbon nanotubes and enables the dispersion of single nanotubes in organic solvents. You can visit thedvgroup.com to keep updated on some the exciting science.


The DV Group welcomed **Christie Cutting** as a graduate student. We also welcomed **Julia Lenef** and **Nick Caldarone** as undergraduate researchers. We had some departures too: **Dr. Monojit Bag**, **Dr. Dana Algaier**, **Marco Eres**, **Gautam Satishchandran** and **Joe Daignault**. **Monojit** is now a faculty at the Indian Institute of Technology at Roorkee. **Dana** has a teaching assignment at Hampshire College in Amherst, MA. **Marco** is a graduate student at the University of California, Berkeley and is working with **Profs. Ting Xu** and **Alivisatos**. **Gautam** is a graduate student in physics at the University of Chicago. **Joe** is a manufacturing engineer at the AmericanBio.

From the graduate alumni side, **Amar** is now a faculty at BML Munjal University, Gurgaon, India. He also received the *Young Investigator Grant* from Department of Science and Technology in India. **Dipankar** is now research scientist at Solvay in Gujrat India. **Sravan** is back in Amherst as a lecturer in our department. **Nag** is a postdoc at UIUC with **Jeff Moore** and this fall, he will start as an assistant professor at Georgetown University in Washington DC. I got a surprise visit from **Sumono Arobo** in December. **Sumono** was an undergraduate in our lab and worked on the copper project. He has his own business and is doing well. I get annual Christmas cards from **Travis**, **Derek**, and **Jay**. Thank you! DV is proud of all of your achievements and would like to hear from all of you. So drop a line when you can to dv@umass.edu. For group updates and news, visit us on the web at thedvgroup.com and follow us on twitter @dvgroupumass.

In the WOOD LAB ...

The big event in the Wood lab was a field project in Bloomington, Indiana investigating radical chemistry in forests. We deployed our new peroxy radical sensor “ECHAMP: Ethane CHEmical AMPlifier” to a research forest just outside of Indiana University for the month of July of 2015 as part of three year NSF project. This newly-developed instrument quantifies the very low concentrations (1 to 50 parts per trillion) of total peroxy radicals (e.g., HOO, CH₃OO, etc.) in the air. Peroxy radicals are the very first oxidation products of those nice-smelling volatile organic compounds emitted by trees – and their fate affects the formation of particulate matter (bad to breathe, but with a cooling effect on the planet) and ozone (bad to breathe and a greenhouse gas). The instrument worked (yay!) and we determined that ozone formation rates were very low – mainly thanks to the last couple decades of decreasing NO_x emissions from power plants.


Postdoc **Shuvashish Kundu** and chemistry undergraduate **Benjamin Deming** played critical roles in making the project a big success! Paper writing and preparation for the next field deployment (Michigan, July 2016) are keeping us busy now.

In other news we have recently been notified that we will be funded by the National Oceanic & Atmospheric Administration to participate in a four year project investigating the impact of North American wild fires on air pollution and climate change – so we’ll be busy with both live forests and burning forests! 

Stein Symposium—continued from page 2

The event was made possible by support from the Departments of Chemistry and Polymer Science and Engineering, the College of Natural Sciences, and from gifts to the *Dr. Richard and Judith Stein Endowed Fund for Sustainability and Renewable Energy*.

Thanks to the speakers, moderators, supporters and all of the guests for participating in Prof. Stein’s birthday celebration and making it such an enjoyable and memorable day! And thanks to Prof. Stein for giving everyone a reason to get together and celebrate, and for his countless contributions to his students’ lives, to our campus, and to the fields of chemical and polymer research.

For event photos, presentations and information, please visit www.chem.umass.edu/steinSymposium.html. 



(left to right) Drs. Saleh Abdel Karim Jabarin, Robert Prud’homme, Pi Chang, Richard Stein and Ashok Misra.

chemistryRETIREMENTS

A retirement celebration was held on Thursday, November 12, 2015, in the Amherst Room of the Campus Center. Three outstanding chemistry colleagues were honored.




Prof. Paul Lahti, Margaret MacDonald, and Prof. Edward Voigtman

PROFESSOR PAUL LAHTI retired after 30 years of high profile service to UMass Chemistry. In the classroom, Paul was deeply admired by his students, in service as department head, he was appreciated by his colleagues, and in research, he earned international recognition for his many accomplishments. He was the only faculty to be recognized by the College of Natural Sciences and Mathematics in his receipt of the trifecta of awards in Research, Teaching and Service. Paul led an internationally renowned program in the area of organic materials that resulted in over 200 peer-reviewed publications. His 1996 paper (in collaboration with Prof. Nishide of Waseda U) entitled “Poly(phenylenevinylene)-Attached Phenoxy Radicals: Ferromagnetic Interaction through Planarized and π -Conjugated Skeletons” provided molecular designs for generating potential spintronic materials. His 1987 paper entitled “Use of the Pariser-Parr-Pople Approximation to Obtain Practically Useful Predictions for Electronic Spectral Properties of Conducting Polymers” provided relationships to predict the band-gap of common conjugated polymers from the degree of polymerization. His world-renowned research in the area of molecule-based magnets established fundamental relationships between the molecular connectivity and magnetic properties. He was the editor of the book entitled *Magnetic Properties of Organic Materials* which is a comprehensive overview of the field of molecule-based magnets. More recently, Paul did pioneering work in the areas of organic light emitting devices, organic photovoltaics, and organic

thermoelectrics. Through Paul’s research program, he provided a wonderful training opportunity for more than 60 graduate students, postdocs, research scientists, and *innumerus* undergraduates. He established and maintained close ties with universities in Brazil, China, and Japan. Back home at UMass, he recently co-directed the \$16 million Energy Frontiers Research Center, funded by the Department of Energy. Not content with quiet retirement, Paul is now a Discovery Research Fellow at Universal Display Corporation in Ewing NJ, where his expertise in organic light emitting diodes (OLEDs) is helping to brighten our world.

MARGARET MACDONALD served the department as head’s assistant for about ten years, this after almost 20 years of dedicated service in Physics, and nine years in other departments on campus. In her role as assistant to the head in Chemistry, she ably kept department heads on track – not an easy task, to be sure. More broadly, she also managed the entire faculty more generally, handling appointments, personnel actions and the like. Some say that managing faculty in academia is like herding cats; Margaret dealt with a wide variety of “cats” with grace and patience. She also worked well with staff across the department and the college. She is currently enjoying retirement by spending more time with her miniature horses, grandchildren, gardening, artwork, and of course, travelling-with a recent trip to Hawaii!

PROFESSOR EDWARD VOIGTMAN retired after 29 years of dedicated service to our department and its students. Ed was tireless in his promotion of UMass Chemistry and was a wonderful departmental citizen, recently serving simultaneously as undergraduate program director and associate head (and this right after a stint as graduate program director!). He would often maintain, and volunteer to teach, a “super secret” section of Gen Chem, just in case enrollment in other sections peaked beyond our expectations – no student was turned away! A super-positive colleague throughout his career, we’ll miss his recent “countdown to retirement” clock.

Ed’s published work on statistical analysis of limits of detection and noise in optical measurements placed him uniquely in his field, and his love of chemical demonstrations for the public and knowledge of all things chemistry placed him uniquely in the department (happily, this love of showy demonstrations is now propagating to those who have followed him). Ed is the “go to guy” for questions across the periodic table. We’ll miss that, but we’ll keep him on retainers for his expertise! 

staffNOTES

ISB LAB STAFF CHANGES

We have had a couple of changes to our ISB laboratory positions. Post retirement of long-term employee **Don Taylor** (2014), existing employee **Raina Kittilstved** has transitioned into the Organic Lab Technician position. **Supamon (Mint) Singkankachen** was hired in Fall 2014 to replace Raina's former teaching lab support position.


OFFICE STAFF CHANGES

In Lederle Towers, with the retirement of long-term employee **Margaret MacDonald**, the position of Assistant to the Head is now held by **Carrie Morrison Penland**. **Boyana Dragicevich** was hired in June 2015 as our seminar and safety coordinator. **Amanda Bennett** is our Interim Personnel Coordinator in the main office. In ISB, with the retirement of long-term employee **Marie Whalen**, **Brigette McKenna** is currently the Interim Undergraduate Program Manager. **Seung-eun Lee** was hired as the Undergraduate Program Assistant.

NEW GLASSBLOWER

Since the Administration decided we no longer needed a full-time glass shop, **Tim Landers** resigned. I am happy to say that **Sally Prasch** has returned in her role as industrial glassblower. For the near future, the shop is open on Fridays only. Sally is also interested in restarting an undergraduate glassblowing course in the near future. Please contact the glass shop or Sally directly for additional information (sprasch@umass.edu).

FACULTY CHANGES

With the retirement of **Peter Samal**, **Chris McDaniel** has assumed the role of Organic Lab Guru. The Summer of 2015 **Paul Lahti** and **Ed Voigtment** retired. **Julian Tyson** has announced his upcoming retirement in summer 2016. In the Winter 2016, **Jim Chambers** relocated from LGRT over to LSL2 to become part of the Institute for Applied Life Sciences (IALS) and runs their new Light Microscopy Core Facility on the fifth floor. 

Letter from the Head—continued from page 28

This great crop of new faculty joins a group that is similarly stellar. Vince Rotello, who has recently been named Editor-in-Chief of the ACS journal *Bioconjugate Chemistry*, won the 2016 Bioorganic Chemistry Award from the Royal Society of Chemistry and received the TREE (Transformational Research and Excellence in Education) award from the Research Corporation. He has also been listed on the 2015 (and 2014) Thomson-Reuters Most Cited Researchers list. Lila Gierasch has been named Editor-in-Chief of the *Journal of Biological Chemistry* and was elected to the American Academy of Arts and Sciences. Mike Maroney was named a AAAS Fellow, while Thai Thayumanavan was awarded the Chemical Research Society of India's Medal of Honor. Thai and a team of scientists from other universities were awarded a \$6.25 million grant from the DOD's Multidisciplinary University Research Initiative, to study molecular algorithms: how chemical processes go from molecular to macroscopic. Scott Auerbach received the first ever Manning Prize for Excellence in Teaching and was awarded a Coleman Fellowship from the Berthiaume Center for Entrepreneurship. Lynmarie Thompson, along with many colleagues in and outside of Chemistry successfully renewed our

NIH Chemistry-Biology Interface Training grant, while Jeanne Hardy and a similarly talented group of cross-disciplinary faculty received funding for a new NIH training grant in Biotechnology. Finally, Min Chen is the proud recipient of an NIH R01 research grant to develop the OmpG nanopore for single molecule protein sensing and Kevin Kittilstved received an NSF CAREER award to study quantum dot analogs, with downstream implications for consumer products such as next generation LEDs. They are each off to a great start in their careers.

Finally, we continue to be deeply grateful to all of you who have contributed so generously to our department over the years. Your gifts are invaluable towards improving our teaching and research facilities and providing scholarships to students. With your support, we will forge ahead, pushing the frontiers of knowledge and training top-notch scientists!

Sincerely,


Craig Martin, Department Head

iCons MAKES QUANTUM LEAPS



iCons 2 Grand Finale Energy Debate.

The Integrated Concentration in Science (iCons) Program at UMass Amherst remains the signature interdisciplinary science program on campus. Involving faculty and students from 25 different science, technology, engineering, and math (STEM) majors across campus – all working on real-world problems in diverse student teams – the UMass iCons Program has made quantum leaps in 2015, its fifth year since the program was launched. As the iCons Program prepares to graduate its 3rd cohort (the so-called “Third Axis”) in spring 2016 with a record number of seniors, our progress can be measured in important ways: the hiring of a new, full-time staff manager; the renewed commitments of our corporate sponsors; a memorable evening with a special guest; and the ever-expanding reach of the iCons faculty.

WELCOME CAMERON HOLDEN, THE NEW ICONS PROGRAM MANAGER

Please welcome **Cameron Holden** as the new program manager of the iCons Program. **Holden** came to UMass Amherst in 2014 after teaching secondary school in Detroit and Sacramento for nearly a decade. With a BA in English and an MA in education both from U Michigan, **Holden** began as the full-time program manager on October 1, 2015. She takes over for **Jane Markarian**, who managed the iCons Program from its inception in 2008; **Markarian** will continue in her duties as manager of special projects and outreach for the College of Natural Sciences.

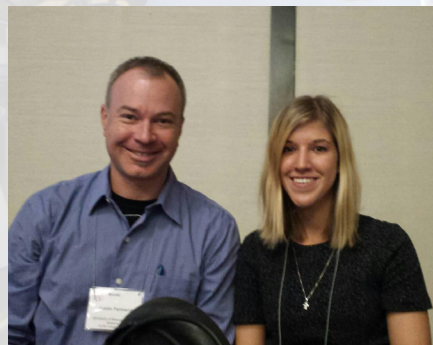
“I am excited and honored to be a part of a program that is pushing the limits in education,” **Holden** says. “As a teacher in middle school and high school, I developed a deep appreciation for teaching that connects students to real-world applications. I believe strongly in the student-driven, integrated, team approach that iCons offers and I am thrilled to be a part of its growth.”

“I am delighted that we were able to attract **Cameron** to this new position,” says **Scott Auerbach**, chemistry professor and director of the iCons program. “Hiring **Cameron** as our first full-time program manager bodes well for the future of iCons and its students.”

GROWING ALLIANCES

The unique skills that iCons students develop during their teamwork on real-world problems give them a clear advantage as interns and employees working with members of the iCons Corporate Alliance. Both Anika Therapeutics and Waters Corporation recognize the value of the iCons Program, and have recently signed three-year pledges for the iCons Corporate Alliance at the Network Alliance level. In 2016, Anika doubled the number of internship opportunities held for iCons students, and are currently considering candidates for both R&D and process engineering positions.

The Waters-iCons partnership continues to produce benefits for both Waters and iCons as featured in a blogpost of the Associated Industries of Massachusetts. Waters is loaning UMass iCons a “supercritical fluid chromatograph” (SFC) instrument to allow iCons students to make measurements associated with a case study on Environmental and Food Safety.



Professor Justin Fermann and Erin Amato.

“I am excited and honored to be a part of a program that is pushing the limits in education”



Dr. Jeff Karp at the Fall Workshop.

In other exciting news, Boston-Power, Inc, a battery company that supports the electric vehicle industry, has come onboard as the first sponsor in the field of alternative energy technologies!

REAL-WORLD INSPIRATIONS

This fall 2015, **Professor Jeff Karp** presided over the iCons Fall Workshop. **Prof. Karp**, a leading biomedical engineer at Harvard Medical School, wowed the iCons community with his workshop on biomimicry – developing new materials and processes that build on Mother Nature’s successful designs. The iCons students tackled a problem introduced by **Prof. Karp**: developing new, synthetic materials to facilitate healing

after surgery on neonates. **Prof. Karp** worked with student teams to identify the pros and cons of student-designed solutions, and then shared his research breakthroughs on bio-inspired tissue adhesives. Dozens of students remained after the workshop – filled with enthusiasm and energy – discussing other problems studied by **Prof. Karp**, and learning about opportunities in **Prof. Karp**’s multi-disciplinary laboratory. All agreed that this workshop was the best ever, confirming the power of the iCons approach to learning science.

EVER EXPANDING REACH OF ICONS FACULTY


iCons faculty remain eager to share the iCons story and methods to broaden the impact of iCons on STEM education. Chemistry Professor and iCons Program Director, **Scott Auerbach**, wrote an impassioned article featured in *The Huffington Post*, “How Science Education Can Save the World” (December 21, 2015). In it, he argues that we need to change the way that math and science are taught in American high schools to produce an informed electorate, able to address challenges such as climate change.

In November 2015, Chemistry Professor and iCons faculty, **Justin Fermann**, and iCons alumna, **Erin Amato**, were invited presenters at the Association of American Colleges and Universities (AAC&U) Conference in Seattle. The forum, entitled “Crossing Boundaries: Transforming STEM Education,” showcased students’ stories about the kinds of college learning that matter most, and examined how institutions can foster innovative approaches such as those in iCons to problem-based learning for all students.

The iCons Program gratefully acknowledges generous support from its loyal alumni base, and from other UMass alums. A recent alumni donation supports a collaboration involving iCons Director **Scott Auerbach** and the UMass College of Education, working to bring iCons case studies into Chicopee high school science classes. We hope to bring the excitement of iCons far and wide, and close to home as well.

One important way to showcase the successes of iCons is through our online Student Showcase, featuring brief videos produced by iCons students explaining the societal importance of their senior thesis projects.

To see the latest installment of the iCons Student Showcase from the Third Axis, please follow this link: <https://www.cns.umass.edu/icons-program/students/icons-presents-the-third-axis>.

We thank all Chemistry alumni near and far for your support for and interest in the UMass iCons Program. We could not do it without you! We look forward to another exciting year, transforming the lives of today’s students, becoming tomorrow’s leaders. 



iCons Second Wave—Class of 2015

2015 SEMINAR SERIES

The 2015 UMass Amherst Department of Chemistry seminar series brought many outstanding scientists to our campus to share their insights and recent developments. Some of the highlights of the 2015 seminars included several distinguished speakers from various fields in chemistry.

Each year UMass Amherst, Smith, Mt. Holyoke, Amherst and Hampshire Colleges co-host the *5-College Lecture Series in Chemistry*. For 2015, we welcomed **Professor Phil Baran** from the Department of Chemistry at the Scripps Institute as the 5-College Lecturer. **Prof. Baran** has won numerous prestigious awards including the ACS Award in Pure Chemistry, Sackler Prize, Beckman Young Investigator, NSF CAREER Award, and National Fresenius Award, to list just a few. The title of his seminar at UMass was “Scalable Synthesis and New Bond Forming Reactions.” **Prof. Baran** discussed his group’s recent contributions enabling novel organic coupling reactions.



Professors Craig Martin, Karl Wieghardt, Jane Rausch, and Michael Maroney

Professor Karl Wieghardt from Max-Planck-Institut-Mülheim, was the *Marvin D. Rausch Lecturer in Organometallic Chemistry* this year. **Prof. Wieghardt** is a world-renowned leader in inorganic and bioinorganic chemistry, specifically the synthesis, reactivity and structure determination of transition metal complexes, the mechanism of electron transfer reactions, and polynuclear metal centers in chemistry and biology. On April 9, he gave a talk entitled “Coordination Chemistry with Organic pi-Radicals: Where are the Electrons?” In his talk, he described interesting peculiarities that occur in coordination compounds with redox-active metal centers and ligands.

Professor Mitch Winnik from the University of Toronto presented the *Stein-Covestro Honorary Seminar in Polymer Chemistry* on October 22. **Prof. Winnik** presented a lecture on “Metal- Chelating Polymers and Lanthanide Nanoparticles for Immunoassays by Mass Cytometry.” In this talk, he described his group’s work developing novel nanotechnologies to analyze the contents of whole cells.

On November 19, the 2015 *William E. Mahoney Annual Lecture* was given by **Professor Prashant Kamat** from Notre Dame. **Prof. Kamat** is Samsung Distinguished Professor in




Professors Richard Stein, Mitch Winnik, and Don Wardius (Covestro)

Nanoscience and Nanotechnology Research and Editor-in-Chief of a new journal, *ACS Energy Letters*. His lecture, “Organic Metal Halide Perovskites for Next Generation Photovoltaics” described the current state of this promising new material for solar photovoltaics that have efficiencies comparable to silicon solar cells.



Professors Prashant Kamat and Kevin Kittilstved

We are grateful for the generous contributions of our alumni and corporate sponsors, who make the success of the seminar program possible. More information about the upcoming seminars and events can be found at www.chem.umass.edu/events/. We look forward to another exciting seminar series in the next year! 

dissertation DEFENSE SEMINARS

GRADUATE STUDENT	SEMINAR TITLE	DATE	RESEARCH ADVISER
Daniel F. Moyano-Marino	<i>“Structure-Property Relationships at the Nano-Bio Interface: Engineering the Nanoparticle Surface for Immunomodulation”</i>	March 30, 2015	Vincent M. Rotello
Joelle A. Labastide	<i>“Time- and Polarization-Resolved Photoluminescence Studies of Directional Coupling in Isolated Semiconductor Nanostructures”</i>	April 2, 2015	Michael D. Barnes
Cornelius Taabazuing	<i>“Inhibition and Cofactor Targeting of Hypoxia-Sensing Enzymes”</i>	April 3, 2015	Michael J. Knapp
Daniel Seeman	<i>“Protein Charge Anisotropy Mediated Self-Association and Phase Separation”</i>	May 14, 2015	Paul L. Dubin
Amanda Marie Hussey	<i>“Chemical Biology-Based Probes for Labeling Targets on Live Cells”</i>	May 21, 2015	James J. Chambers
Brian Creran	<i>“Inkjet Printing for Biosensing and Security Applications”</i>	May 26, 2015	Vincent M. Rotello
Stephen T. McCarron	<i>“Photochemical Tools for Fluorescent Labeling of Endogenous Proteins”</i>	May 29, 2015	James J. Chambers
Longyu Li	<i>“Responsive Supramolecular Assemblies Based on Amphiphilic Polymers and Hybrid Materials”</i>	June 3, 2015	S. Thai Thayumanavan
Angela N. Miguez	<i>“Quantum Calculations of Aldol Condensation in Acidic Zeolite Clusters”</i>	June 12, 2015	Scott M. Auerbach
Murat Tonga	<i>“Conjugated Polymers in Thermoelectric Composites and Small Molecules for High Light Absorptivity”</i>	August 14, 2015	Paul M. Lahti
Ololade Fatunmbi	<i>“Utilizing In Silico and/or Native ESI Approaches to Provide New Insights on Haptoglobin/Globin and Haptoglobin/Receptor Interactions”</i>	August 17, 2015	Igor A. Kaltashov
Julius O. Campeciño	<i>“Semisynthetic Strategy Leads to Alteration of the Backbone Amidate Ligand in the NiSOD Active Site”</i>	August 21, 2015	Michael J. Maroney
Timothy Sean Gehan	<i>“From Molecular Scale to Mesoscale: Establishing Structural Control in Organic Photovoltaics Using Organic Nanoparticles”</i>	August 21, 2015	Paul M. Lahti & Dhandapani Venkataraman
Cristina B. Martin	<i>“Kinetic and Dynamic Insights into the Substrate Interactions and Catalysis of Factor Inhibiting HIF (FIH-1)”</i>	August 25, 2015	Michael J. Knapp
Krishna R. Raghupathi	<i>“Self-Assembly and Stimuli Responsive Disassembly of Dendritic and Oligomeric Amphiphiles”</i>	September 4, 2015	S. Thai Thayumanavan
Jiaming Zhuang	<i>“Stimuli Responsive Polymer Self-Assembly and Disassembly”</i>	October 1, 2015	S. Thai Thayumanavan
Nicholas B. Borotto	<i>“The Application of Hydrogen/Deuterium Exchange and Covalent Labeling Coupled with Mass Spectrometry to Examine Protein Structure”</i>	October 22, 2015	Richard W. Vachet
Bradley Duncan	<i>“Supramolecular Strategies for the Generation of Nanoparticle Assemblies and Biomolecular Thin Films”</i>	November 19, 2015	Vincent M. Rotello

undergraduate SENIOR & AWARDS DINNER



The 2015 Senior Class.

On April 29, 2015 we held our annual Undergraduate Honors and Awards banquet in the Amherst Room at the Campus Center to honor our students who have proven themselves to be among the very best this University has to offer. During the spring, the Undergraduate Honors and Awards Committee had the pleasure of examining the records of students who had chosen to be a part of our department in order to determine who would be recognized for their achievements. Last spring we recognized the hard work and dedication of 33 graduating seniors. In addition, many students were recognized for their work within the department: see the complete awards list. These awards are only possible because of the generous support the department receives from our alumni, industrial partners and professional organizations. With considerable pride and gratitude, the committee wishes to thank our outstanding students for their contributions to the department and university and wishes to thank those who, in turn, support our students.

The following students received awards:

Marina Franc, Aiste Balciunaite, Emily Chandran, Raphael Mizrahi—CRC Freshman Chemistry Award
Huijing Yu, Abigail Case, Chandler Burnham—Robert Maxwell Williams Memorial Scholarships
Jeffrey Tsai—ACS Analytical Chemistry Award

Zachary Kirsch, Peter Antonucci, Kanae E. Sasaki, Michael Stornanti, Matthew Caissy—Edward Shapiro Scholarship

Kate V. Daborowski—Jay A. Pirog Scholarship

Alexandra R. Stedronsky, Nathaneal A. Park—American Chemical Society Membership Awards

Soo Lim Park—American Chemical Society-Hach Fellowship

Soo Lim Park—John A. Chandler Memorial Scholarship Award

Steve McCarron, Prof. Hans Mentzen, Zachary Plourde, Prof. Nathan Schnarr—Distinguished Undergraduate instructor Award in Honor of Earl J. McWhorter and George R. Richason, Jr.

Cassandra Martin—Oliver Zajicek Memorial Scholarship Award

Alexandra Barbato—ACS Inorganic Chemistry Award

Stefan Marco Eres—ACS Organic Chemistry Award

Alexandra McEnroe—Hypercube Scholar Award

Michael Mortelliti, Thomas Barrasso, Kevin Byrne—Uche Anyanwu Memorial Award for Outstanding Research 2015

Matthew Richard—Mr. Tompkins Award

Leah Caffrey—Bates Research Fellowship

Michael Mortelliti—Bradspies Research Fellowship

Alexandra Barbato—Professor Jack Ragle Research Fellowship

Zachary A. Plourde, Jonathan Ackerman—Departmental Recognition Award

Alexander Papadopoulos, Elisa Lyn Guzman—Richard W. Fessenden Award

Stefan Marco Eres—Connecticut Valley Section of the American Chemical Society (CVS/ACS) Student Award

Chris Borcoche—American Institute of Chemists Award

Elisa Lyn Guzman—Senior Class Award

Alexander Papadopoulos, Nicholas Sargent—Positron Award

Thomas Barrasso, Marguerite Rushanan, and Jeffrey Tsai—UG Research Scholarship Fund Travel Awards

Stefan Marco Eres—University 21st Century Leaders Award **G**

BA/BS degrees AWARDED

Jonathan D. Ackerman	05/2015
Daniel G. Albrecht	05/2015
Alexandra R. Bare	05/2015
Polina Berdnikova	05/2015
Christopher J. Borcoche	05/2015
Sean R. Byrnes	05/2015
Jeffrey S. Cataloni	02/2015
Joseph A. Daigneault	05/2015
David L. Danza	02/2015
Jesse M. Doble	05/2015
Vincent J. Einck	02/2015

Stefan Marco Eres	05/2015
Emily L. Friis	05/2015
Elisa L. Guzman	05/2015
Emily J. Hutchinson	05/2015
Noah M. Jackson	05/2015
Molly M. Jeffrey	05/2015
Harimander S. Khalsa	05/2015
Zachary C. Lane	05/2015
Alexander J. Malanowski	05/2015
Marc H. McDonald	05/2015
Lessa A. McKellick	05/2015

Meaghan A. Molloy	05/2015
Joakim L. Monk	05/2015
Mark A. Nazzaro	05/2015
Alexander Papadopoulos	05/2015
Zachary A. Plourde	05/2015
Walter P. Rice	05/2015
Matthew D. Richard	05/2015
Annikki L. Santala	05/2015
Nicholas J. Sargent	05/2015
Abigail R. Sossen	05/2015
Alexandra R. Stedronsky	05/2015

RESEARCHFEST 2015

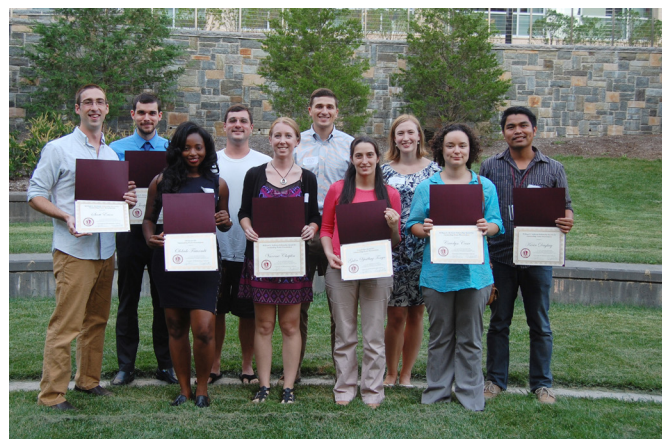
The chemistry department welcomed the 2015-2016 academic year with the 25th annual research symposium, Researchfest. This event was held on September 1, 2015 and was a huge success thanks to the support of participants, organizers, and sponsors. The event featured four oral presentations by graduate students who were selected by a faculty committee through a nomination/evaluation process. **Bay Serrano** (Hardy group) was chosen to receive the **William E. McEwen Graduate Scholarship in Chemistry** for her work on “Phosphorylation Regulates Caspase-9 by Divergent Mechanisms.” **Zhe Zhang** (Vachet group) received the **Dr. Paul Hatheway Terry Graduate Scholarship Award** for Outstanding Presentation for his work on “New Mass Spectrometric Methods for Studying Proteins in the Gas Phase and in Solution.” **Rubul Mout** (Rotello group) received the **Marvin D. Rausch Scholarship Award** for Outstanding Presentation for his work on “Making Self-Organized Organelle-Like Structures” for ‘CRISPR-Cas9 Mediated Genome Editing.’ **Keith Lehuta** (Kittilstved group) received the **Marvin D. Rausch Scholarship Award** for Outstanding Presentation for “Probing the Effects of Dopants in Strontium Titanate-Based Photocatalysts.”



Keith Lehuta, Rubal Mout, Bay Serrano and Zhe Zhang.

A total of over 60 posters were presented this year. **Ololade Fatunmbi** (Kaltashov group) received the **3M Award** for her poster entitled, “Utilizing in Silico and/or Native ESI Approaches to Provide New Insights on Haptoglobin/Globin and Haptoglobin/Receptor Interactions.” **Gulen Yesilbag Tonga** (Rotello group) received the **LiquiGlide Award** for her poster entitled, “Supramolecular Regulation of Bioorthogonal Catalysis in Cells Using Nanoparticle-Embedded Transition Metal Catalysts.” The following eight students received **William E. McEwen Fellowship Awards** for Outstanding Posters:

- **Vanessa Chaplin** (Knapp group), “Manipulating Catalytic Activity of HIF Hydroxylases”



Scott Eron, Joseph Tilitsky, Joseph Hardie, Lawrence Renna, Christie Cutting, Kevin Dagbay, Ololade Fatunmbi, Vanessa Chaplin, Gulen Yesilbag Tonga, and Carolyn Carr.

- **Lawrence Renna** (Venkataraman group), “Pervoskite Solar Cells: Why Do they Degrade? The Kinetics of Ion Transport and its Implications on Stability”
- **Christie Cutting** (Venkataraman group), “Shifting Perspective: Photovoltaics for Indoor Light Applications”
- **Carolyn Carr** (Maroney group), “Differential Role of Glutamate Ligands During Metal Response in the *E. coli* Transcriptional Regulator, RcnR”
- **Kevin Dagbay** (Hardy group), “Probing the Domain Architecture of Caspase-6 Reveals Mechanisms for its Regulation”
- **Scott Eron** (Hardy group), “Deciphering the Regulatory Effects of Phosphorylation on the Apoptotic Caspase-7”
- **Joseph Tilitsky** (Gierasch group), “Binding of an Hsp70 Molecular Chaperone to its Protein Substrate is Hierarchical”
- **Joseph Hardie** (Farkas & Rotello groups), “Cytosolic Delivery of Therapeutic RNA Nucleotides and Hydrophobic Drugs Using Self-Assembled Gold Nanoparticle-Stabilized Nanocapsules for Breast Cancer Therapy”

A whole day with chemistry and scientific discussions was brought to an end with a delicious cookout served outside in the beautiful LSL amphitheater by the Student Development Committee, graduate students and staff members. The BBQ brought the students, faculty, staff, and their families together to socialize.

We gratefully acknowledge the financial support we received for this event from the UMass Amherst Department of Chemistry, **Marvin D. Rausch Scholarship Fund**, **Dr. Paul Hatheway Terry Scholarship**, **William E. McEwen Endowment Fund**, **3M** and **LiquiGlide**, the Graduate Chemistry Association, and alumni support. We also had these following vendors who came to show us what their company had to offer: Thermo Scientific, Spectrum, Malvern, IKA, Fisher Scientific, 3M, Advanced Cell Diagnostics, Eppendorf, Beckman Coulter, Art Robbins Instruments.

If you are interested in contributing to this event, please contact **Vicki Hubby** at vicki@chem.umass.edu 



Physical Sciences Building and West Experiment Station.

The building was designed by Wilson Architects and construction is managed by Whiting-Turner. It features high-efficiency fume hoods for energy savings and incorporates numerous green building features. It will be Leadership in Energy and Environmental Design (LEED) certified at the Silver or Gold level.

Siting the PSB required relocating West Experiment Station (WES), a Romanesque Revival style, historic

brick structure built in 1887 as a chemistry laboratory for the Massachusetts Agricultural Experiment Station (MAES), established in 1882. Prof. Charles A. Goessmann was the first director of MAES and his office was on the first floor of the building's distinctive corner tower. Goessmann oversaw extensive research on the chemical composition of soils, fertilizer, feed and agricultural products. The poor condition of WES precluded moving it. Instead, it was carefully dismantled, the original materials were salvaged where possible. It will be rebuilt around a new steel framework and will incorporate modern mechanical, electric, plumbing, and fire protection. The new building will provide office space for physics faculty and graduate students.

A video of the dismantling of WES can be viewed at <http://www.umass.edu/newsoffice/article/video-brick-brick-reconstruction-west>

“The Physical Sciences Building will be an exciting new environment for the students. In the current organization in the tower, the students have less opportunity to interact with each other, because the space is tight and there is no real space dedicated for interaction among students. The new configuration in PSB will greatly enhance interactions and collaborations among students. In addition, all other infrastructure, such as the group equipment and biological facilities, will all be localized in one proximal space. This will greatly benefit the productivity of the students. Also, the building will be up-to-date for the safe storage and handling of chemicals. Oh! the fact that it will simply be a shiny new space also might have something to do with the excitement!!”—Prof. Thayumanavan



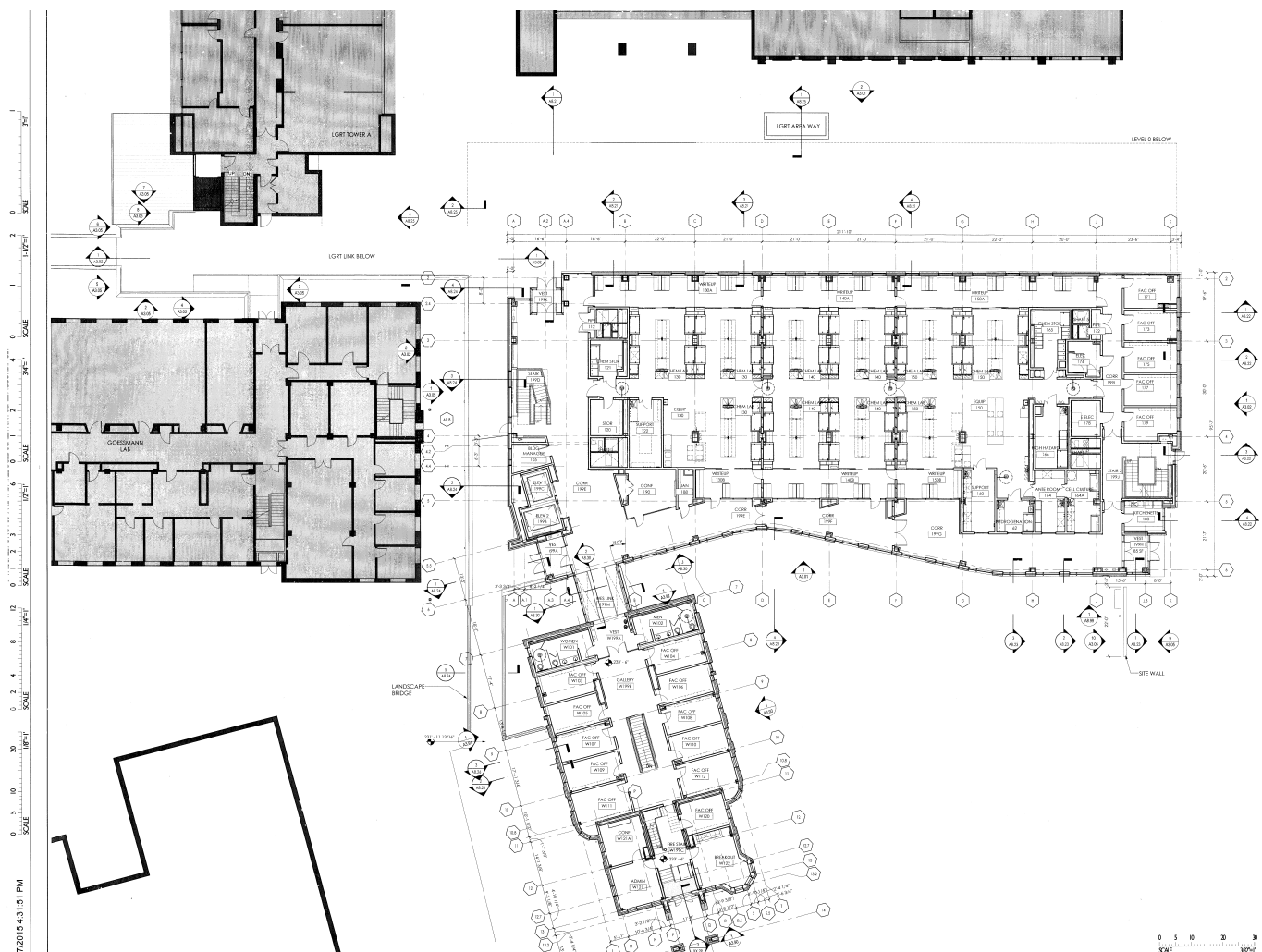
The dismantling of West Experiment Station.

In a second project, a portion of the second floor of Goessmann Hall is expected to be extensively renovated into a shared analytical equipment space to support the entire department. This shared space will include a NMR, X-ray diffractometer, and multiple smaller instruments. An elevated walkway will connect the Physical Sciences Building to the second floor of Goessmann.

The labs feature an open floor plan with clear sight lines. This makes the resulting space very flexible, so it can be readily adapted to meet evolving research needs. Student writeup desks are adjacent to the labs, separated by a glass wall, to allow for monitoring of ongoing reactions. There are dedicated rooms for high hazard work, solvent dispensing, mammalian and bacterial cell culture. The open lab design and common spaces enhance interdisciplinary research and facilitate collaborations. **g**

“The Physical Sciences Building (PSB) will be a big boost for collaborative research because researchers with similar interests will be in close proximity. It will help foster a vibrant research community in synthetic chemistry. For example, my research group will be sharing the lab corridor with Prof. Kevin Kittilstved’s group (chemistry), which will allow our students to talk to each other on a daily basis and exchange ideas.”

–Prof. Venkataraman



First floor of the PSB which will be home to the Kittilstved and Venkataraman labs.



friends of umass amherst chemistry **THANKS FOR YOUR SUPPORT!**

Giving Period: January 1, 2015–December 31, 2015

ENDOWMENTS

Roger G. Bates Chemistry Fund
J.F.B. Fund for Undergraduate Research in Chemistry
John A. Chandler Memorial Scholarship in Chemistry
Chemistry Undergraduate Research Scholarship
Richard Fessenden Fund
Donald E. & Phyllis J. Kuhn Graduate Scholarship in Chemistry
Richard & Barbara Mahoney Chemistry Fund
William E. McEwen Endowed Memorial Scholarship Fund in Chemistry
Charles A. Peters Fund
Jay A. Pirog Scholarship Fund
The Professor Jack Ragle Endowed Fund in Chemistry
Marvin D. Rausch Lectureship in Organometallic Chemistry
Dr. Richard and Judith Stein Endowed Fund for Sustainability and Renewable Energy
Edward Shapiro Scholarship Fund
Dr. Paul Hatheway Terry Endowment
Robert Maxwell Williams Memorial Scholarship Fund

RECOGNITIONS, HONOR, MEMORY

Dr. Uche Anyanwu
Dr. David J. Curran
Mr. Stefan M. Eres
Professor Justin T. Fermann
Dr. Robert E. Graf
Mr. Michael N. Levine
Mrs. Cathryn G. McEwen
Dr. Marvin D. Rausch
Dr. George R. Richason, Jr.
Mr. Robert M. Stewart
Dr. Paul H. Terry
Professor Dhandapani Venkataraman
Professor Alfred M. Wynne
Professor Oliver Zajicek

ORGANIZATIONS

3M
American Chemical Society
CEM Corporation
Cytec Industries Inc.
Eli Lilly and Company Foundation
Flexcon Co., Inc.
IBM International Foundation
Intel Corporation
Johnson & Johnson
LiquiGlide Inc.
MeadWestvaco Foundation
Monsanto Fund
Pfizer Foundation
Photonis USA Pennsylvania, Inc.
Procter & Gamble Company
ReclaimRx, LLC
Steinkopff

Turners Falls Athletic Club, Inc.
University of Mass. Alumni Association
Verizon Foundation
Waters Corporation

DEAN'S CIRCLE (\$1000+)

Anonymous Donor
Dr. Ucheoma O. Akobundu
Professor Ronald D. Archer
Dr. Mark D. Argentine
Dr. John S. Babiec, Jr.
Ms. Beatrice Botch
Mr. John J. Bukaty, Jr.
Mrs. Sally A. Bukaty
Ms. Karen Carpenter
Dr. Sara E. Crumm
Dr. Thomas E. Crumm
Dr. James E. Curley
Mr. Harvey W. Gendreau
Dr. Donald E. Kuhn
Mr. James M. Malandrinos
Dr. Edward P. Marram
Dr. Suzanne A. McEnroe
Mrs. Donna R. O'Connell
Mr. John F. O'Connell, Jr.
Professor Peter Robinson
Professor Peter W. Samal
Dr. Emil J. Slowinski
Mrs. Emily D. Slowinski
Estate of Paul H. Terry
Mrs. Tina Velantzas-Austin
Dr. Anchuu Wu

GOESSMANN CIRCLE (\$500-\$999)

Mr. Felix S. Alfonso
Mr. Charles M. Chandler
Dr. Charles E. Clapp
Dr. Robert F. Courmoyer
Dr. David J. Curran
Mrs. R. Nancy Curran
Dr. Dennis S. Hackett
Dr. Charles J. Hora
Dr. Brian Jordan
Dr. Rajdeep S. Kalgutkar
Dr. Thein Kyu
Dr. Thomas H. Mourey
Dr. Serkan Yurt

PETER'S CLUB (\$1-\$499)

Anonymous Donors (4)
Dr. David L. Adams
Dr. Anne M. Andrews
Dr. Kwasi Antwi
Mr. Curtis A. Barratt
Ms. Amanda L. Batten
Mr. Steven C. Bauman
Dr. Richard A. Berglund, Jr.
Parvinder S. Bhatia
Dr. Alan R. Blanchette
Mrs. Susan F. Blanchette
Mr. Allen C. Bluestein
Dr. Wyndham H. Boon
Mr. James V. Bruno
Mrs. Margaret Bruno
Mrs. MaryAnn Bruno
Dr. Michael F. Bruno
Ms. Jane M. Burdick
Dr. Alan P. Carpenter
Mrs. Janice Q. Carpenter
Mr. Alcon H. Chadwick
Mr. Joel B. Charm
Hiba Chedid
Zakhia Chedid
Ms. Wai C. Cheng
Dr. Paul J. Clark
Mr. Michael J. Clifford
Dr. Nye A. Clinton
Mrs. Rosa K. Conlon
Dr. Robert E. Connors
Mr. John P. Cosgrove
Mrs. Anne Cragin
Mr. James H. Cragin
Dr. Gregory M. Dabkowski
Mr. David E. Dolny
Mr. Brian M. Driscoll
Ms. Patricia L. Driscoll
Ms. Elizabeth DuHamel

friends of umass amherst chemistry **THANKS FOR YOUR SUPPORT!**

(CONTINUED) Giving Period: January 1, 2015–December 31, 2015

This issue of the Goessmann Gazette is brought to you by the Department of Chemistry.


Design, Photography & Production:
Lisa Korpiewski

gazette@chem.umass.edu
www.chem.umass.edu

Dr. John P. Dusza
Mrs. Patricia M. Dusza
Ms. Amy M. Elder
Mr. Carl R. Elder
Mr. Gyula Eres
Dr. Kieron P. Faherty
Ms. Carol A. Fawcett
Dr. Timothy G. Fawcett
Miss Lisa A. Federman
Mr. Igor Feinberg
Ms. Lilia Feinberg
Mr. Adam J. Finne
Ms. Sheila A. Finnerty
Ms. Shirley E. Flaggs
Mrs. Jane E. Fortin
Dr. Joan C. Fu
Dr. Paul C. Fu
Dr. Charles R. Gallucci
Dr. Judith C. Gallucci
Dr. Robert G. Gaster
Dr. Walter K. Gavlick
Ms. Margaret A. Geraghty
Dr. M. Joyce Graf
Dr. Anthony V. Grossi
Mr. Robert M. Haff
Mrs. Yvonne O. Haff
Ms. Deborah J. Ham
Ms. Nobuko Hama
Mr. Tadahiro Hama
Mrs. Elizabeth W. Harris
Mr. William C. Harris, Jr.
Dr. Martha R. Heimann
Mrs. Moreen Hernon
Mr. Stephen Hernon

Mr. Philip L. Iampietro
Professor William M. Irvine
Dr. William M. Jackson
Ms. Rebecca A. Johnson
Mr. Richard P. Judkins
Mr. Daniel H. Kaufman
Mr. Peter R. Keyser
Mr. Kenneth Z. Koziak
Mr. Peter F. Kulkosky
Dr. Marc L. Kullberg
Mrs. Carol A. Laflamme
Mrs. Mary D. Larkin
Mr. Ronald D. Lees
Mr. Clark A. Lennon
Mr. Lucas Leong
Professor Susan B. Leschine
Mr. David J. Levine
Mrs. Paula M. Levine
Ms. Chengbei Li
Dr. Giselle B. Limentani
Dr. Arthur L. Lipman, Jr.
Mrs. Barbara P. Lockett
Dr. Kathryn A. Lysko
Mrs. Patricia F. Majchrowski
Mr. Thomas F. Majchrowski
Mr. Joseph Malgiolio
Mr. Thomas A. Malloy, IV
Mr. Benjamin H. March
Mrs. Cecelia H. Marshall
Dr. Louis V. McAdams, III
Dr. Edward F. Miller
Dr. Joel W. Miller
Dr. Oscar R. Miranda-Sanchez
Dr. Anastasia Morfesis

Mr. James T. F. Mullowney, Jr.
Dr. Kathleen C. Murphy
Dr. Owen J. Murphy, III
Ms. Barbara R. Neumann
Dr. Fatemeh Nowshad
Mr. James Oberlander
Ms. Brigid F. O'Brien
Mrs. Elinor S. O'Neil
Dr. Rolando U. Pagilagan
Mr. Paul S. Palumbo
Ms. Annie Perkins
Mrs. Myrtle H. Perkins
Dr. Harold Petersen
Dr. Joseph Powers
Dr. Mary Powers
Dr. Michelle A. Pressler
Dr. Robert A. Pribush
Dr. Jane M. Rausch
Mr. Kyle Reeves
Mrs. Jean M. Rhuda
Mr. Richard A. Ricci
Dr. Kenneth W. Rillings
Mrs. Nancy L. Rillings
Dr. Jason M. Rodrigo
Mr. Christopher A. Rollings
Ms. Kimberly A. Rollings
Mrs. Patricia M. Romano
Dr. Eric G. Rundberg, Jr.
Mr. William M. Russell
Mr. Paul S. Russo
Mrs. Linda A. Saari
Dr. Shawn L. Sager
Dr. Arthur A. Santilli
Dr. Thomas P. Sassi

Dr. Anthony C. Savitsky
Mr. Eric P. Schaff
Ms. Janice D. Schlueter
Mr. Shawn E. Sheehan
Dr. Steven M. Shulman
Dr. David J. Sikora
Dr. Kathleen E. Simmons
Mr. Andrew G. Smith
Ms. Ann M. Smith
Mr. Donald L. Smith
Ms. Janice E. Smola
Ludmila Sousa
Dr. Henry S. Speno
Mr. Edward J. Szczesny
Dr. Michael A. Tarselli
Ms. Inga E. Treitler
Dr. Jung-Hsien Tsao
Dr. James V. Tucci
Mr. Jeffrey S. Tunis
Ms. Pamela Turci
Mr. Erik J. Turnberg
Mrs. Carol R. VanDerVoorn
Ms. Linda M. Warren
Mr. Paul C. Watts
Mrs. Jeanne L. Williams
Ms. Janice M. Wojtkunski
Dr. Bo Yan
Dr. Michael S. Young
Mr. Robert S. Zwonik
Dr. Michael S. Young
Dr. David J. Zepka
Mr. Robert S. Zwonik 

gift giving **MADE EASY**

Your support is an invaluable investment—in the excellence of our students, faculty, teaching, and research programs.

To Donate to Chemistry:

Visit the UMass Amherst online donations web site (link provided below). Please follow these instructions to make sure your gift is targeted toward the Department of Chemistry.

1. Choose your gift amount.
2. Fill out the Gift Designation Page:
 - Fill in the Allocation Amount box with the amount of your gift.
 - In the pull-down menu, choose "College of Natural Sciences."
 - In the optional subcategory pull-down menu, choose "CHEMISTRY" to give an unrestricted gift, or choose "OTHER" to indicate a specific intention (ie. memorial fund). This last step is very important.
3. Fill out the personal information. Click Next: Review and Confirm on the bottom right. Following the remaining steps.

To make your gift online please go to www.umass.edu/development/give

To make your gift offline please contact: Director of Development, College of Natural Sciences, University of Massachusetts Amherst, 710 North Pleasant Street, Amherst, MA 01003-9305
voice: 413-577-4712, fax: 413-545-9784, email: gazette@chem.umass.edu, web: www.cns.umass.edu 



Department of Chemistry
College of Natural Sciences
University of Massachusetts Amherst
122 Lederle Graduate Research Tower
710 North Pleasant Street
Amherst, MA 01003-9336

NON PROFIT ORG
U.S. POSTAGE
PAID
AMHERST MA
PERMIT NO. 2

Change Service Requested

DEAR ALUMNI AND FRIENDS OF THE DEPARTMENT OF CHEMISTRY,

As readers of the Gazette know, UMass has been on an impressive building campaign for the past decade. Starting with the Integrated Sciences Building, then on to the Life Science Laboratory, and now the under construction Physical Sciences Building, Chemistry has been a key player. The Physical Sciences Building, featured in our cover story, will house our synthetic chemistry research labs in state of the art facilities. At the moment, it is a very large hole in the ground, but in Spring 2018, we look forward to giving tours to visiting alumni!

While investment in new laboratories is timely and wonderful, it is the faculty who provide training and opportunities for our students. I am pleased to report that we have just signed three new faculty to start in Fall of 2016. Mingxu You is a bioanalytical chemist, trained in analytical chemistry at the University of Florida, with postdoctoral training at the Weill Medical College of Cornell University. Mingxu will launch a new research program aimed at developing RNA-based fluorescent sensors for imaging metabolites and signaling molecules in living cells, and for optogenetic control of cellular regulation.

I'm also pleased to report our hiring of Eric Strieter, also starting in Fall of 2016. Eric comes to us with a PhD from MIT and postdoctoral work at Harvard, and is currently an Assistant Professor of Chemistry at the University of Wisconsin at Madison. He has developed a thriving research program in bioorganic chemistry, directed at understanding mechanism and function in ubiquitin signaling complexes. Using a wide range of tools from synthesis, to protein NMR, to mass spectrometry, Eric has established himself as an outstanding leader in the field, who should interface well with many researchers both within our department and across campus.

Last, but not at all least, I am delighted to tell you that Trisha Andrew, also currently Assistant Professor of Chemistry at Madison, will be joining us in the Fall of 2016. Trisha, who both earned her PhD in organic chemistry and carried out postdoctoral studies at MIT, has been an Assistant Professor at the University of Wisconsin for less than four years, but has already earned a number of high profile awards, including the David and Lucille Packard Foundation Young Faculty Award, an Air Force Office of Science and Research Young Investigator Award, the ACS PRF Doctoral Young Investigator Award, the 3M Non-Tenured Faculty Award, and has been listed among the Forbes "30 Under 30" in Energy. Trisha's research program develops novel, emergent electronic technologies through innovative molecular design and synthesis, with a focus on developing nanomaterials for renewable energy applications. One example of her out-of-the box research is her development of solar energy harvesting fabrics. Think of the applications!



Telephone: 413-545-2318

Fax: 413-545-0011

Email: depthead@chem.umass.edu

... continued on page 17