

# BADGER CHEMIST

University of Wisconsin–Madison Department of Chemistry

Established 1953, No. 61, 2018

**COVER STORY:**  
Department breaks ground  
on new building (Page 7)



Department of Chemistry  
UNIVERSITY OF WISCONSIN–MADISON



## Department of Chemistry

UNIVERSITY OF WISCONSIN-MADISON

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Badger Chemist is published yearly for alumni and friends of the Department of Chemistry at UW-Madison.

Executive Editor: Matthew Sanders  
matthew.sanders@wisc.edu

Managing Editor: Tatum Lyles Flick  
elyles@wisc.edu

ON THE COVER (from left) Prof. John Moore, Department Chair Prof. Judith Burstyn, Department Executive Director Matt Sanders, Prof. Bob McMahon, and Building Manager Jeff Nielsen break ground on the new building. Photo by Sarah Maughan

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Badger Chemist  
Department of Chemistry  
University of Wisconsin-Madison  
1101 University Ave.  
Madison, WI 53706

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Dear Alumni and Friends:

I am thankful for the positivity, hard work and collaboration that I have witnessed in my time as department chair. Our faculty, staff and students succeed at the highest levels, as evident from their many research publications, awards and achievements. I am convinced that the Department of Chemistry is one of the best places to work and study at UW-Madison.

Construction of our instructional building is underway, after an exciting September groundbreaking celebration. We are grateful for your support and look forward to enhanced learning spaces that will benefit our students. Our existing facility is less full than usual while our large enrollment courses continue in other buildings. I invite you to visit at any time, to see the emerging new building and to feel the excitement of our research laboratories.

We are honored to welcome new faculty and staff, and an outstanding class of new graduate students. We celebrate the successes of our bachelors, masters and Ph.D. graduates and welcome them to the community of Badger Chemists. Being part of the UW-Madison Chemistry legacy connects all Badger Chemists to a long history of excellence, and your continued success builds a future that enables us to excel among our peers.

I am excited about new initiatives within the department. With guidance from the Office of Strategic Consulting, we implemented a streamlined enrollment management process to enable us to absorb more students. Our continuing engagement is creating an organizational structure that will serve the department effectively for the 21st century. Another area of focus is enhancing department climate for students, faculty and staff. Our graduate student council (GSFLC) created new committees to expand programming for students and post-docs focused on health and well-being (including mental health awareness), professional development, and social support. Generous contributions from Badger Chemists like yourselves increased the number of programs that the GSFLC is able to offer, thereby enhancing student life in the department. We also formed a wellness and professional development committee to support healthy work life and career advancement for faculty and staff.

Within this year's edition of Badger Chemist, you will see examples of the educational initiatives, research discoveries and outreach activities in which the department engaged this past year. Many of these wonderful opportunities were made possible through the generous contributions of Badger Chemists like you.

Would you consider a 2018 donation to enhance science education, research and outreach? Gifts of any size help to enhance the student experience, support the top-quality research for which the department is known, and build public support for science through community engagement.

Your gift is an investment in the future of the university and the students who will shape the future of Wisconsin and the world. Show your support for chemistry today at <http://go.wisc.edu/GivetoChemistry>.

On behalf of the entire department, thank you and all the best in 2019!

Sincerely,

Professor Judith Burstyn  
Irving Shain Chair of Chemistry and Department Chair  
burstyn@chem.wisc.edu



# Congratulations! **NEW BADGER CHEMISTS**

**Ph.D. (2016)**

Fisher, Brian (Gellman)

Cyclic Constraints and Stereochemistry in Peptide Foldamer Helices

Heylman, Kevin (Goldsmith)

Toroidal Optical Microresonators as Single-Particle Absorption Spectrometers

Kohler, Daniel (Wright)

Characterization of PbSe Quantum Dot Excitons Using Ultrafast Multiresonant Coherent Multidimensional Spectroscopy

Kratochvil, Huang (Zanni)

Structure and Dynamics of Proteins and Peptides Revealed by Two-Dimensional Infrared Spectroscopy

Kwiecien, Nicholas (Coon)

Computational Approaches for Improved Identification, Quantitation, and Interpretation of Mass Spectrometry-Based "Omics" Data

Mantha, Sriteja (Yethiraj)

Self-Assembly of Gemini Surfactant Molecules and Properties of Nano-Confined Water

Ouyang, Chuanzi (Li)

Multifaceted Mass Spectrometric Approaches for the Crustacean Neuropeptidome Investigation

Smith, Thomas (Raines)

Biomedical Applications Using Boronic Acid

Zhang, Tianqi (Zanni)

Examination of Amyloid Structures on vivo and ex vivo with 2D IR Spectroscopy.

**Ph.D. (2017)**

Ahmed, Maaz (Stahl)

Studies of Heterogenous Palladium and Related Catalysts for Aerobic Oxidation of Primary Alcohols

Alderson, Juliet (Schomaker)

Development and Extensions of Tunable, Selective Aminations via Silver-Catalyzed Nitrene Transfer Reactions

Amador, Adrian (Yoon)

Controlling the Stereoselectivity and Chemoselectivity of Cyclopropyl Ketyl Radical Anions with Visible Light Dual Catalysis

Anson, Colin (Stahl)

Development of a System for Electrocatalytic O<sub>2</sub> Reduction with a Quinone Mediator and a Homogeneous Cobalt Catalyst

Boursier, Michelle (Blackwell)

The Development and Application of Chemical Tools to Probe Quorum Sensing in *Pseudomonas aeruginosa*

Brown, Tristan (Berry)

Foundations for Small Molecule Activation at Reduced Metal-Metal Bonded Complexes

Burke, Eileen (Schomaker)

Regioselective Aziridination of Silyl Allenes and Application for the Synthesis of New Heterocycles

Chang, Wansoo (Mahanthappa)

Organic Phosphonate Coatings on LiNi<sub>0.5</sub>Mn<sub>0.3</sub>Co<sub>0.2</sub>O<sub>2</sub> High Voltage Lithium Ion Battery cathodes.

Dillon, Stephanie (Brunold)

Spectroscopic and Computational Investigation of Ni Superoxide Dismutase and Fe(II)-dependent Thiol Dioxxygenases

Duffy, Erin (Garand)

A Ruthenium Water Oxidation Catalyst and Intermediates: Vibrational Characterization of Isolated and Solvated Cryogenic Ions

Ellison, Aubrey (Raines)

Exploring and Exploiting Invasive Collagen Mimetic Peptides

Fang, Shuyu (Hamers)

Modulation of Electrochemical Processes at the Cathode-Electrolyte Interface in Lithium-Ion Batteries

Foarta, Floriana (Landis)

Asymmetric Hydroformylation of Disubstituted Alkenes and Application in the Synthesis of Oligomers

Gomez, Jaritza (Ediger)

Physical Vapor Deposition as a Method to Prepare Highly Anisotropic Glasses

Gujral, Ankit (Ediger)

Structural Characterization of Vapor-Deposited Organic Glasses

Guo, Xiao (Pagliarini)

Defining the Molecular Function of Mitochondrial Phosphatases

Hager, Marlies (Gellman)

Backbone Modification of Glucagon-Like Peptide-1 (GLP-1) to Alter Signaling at the GLP-1 Receptor

Hang, Mimi (Hamers)

Investigating and Controlling Technologically-Relevant Complex Metal Oxide Nanomaterials to Mitigate Biological Impact

Holden, Matthew (Smith)

Light-directed Technologies for Nucleic Acid Array Fabrication

Jaworski, Jonathan (Stahl)

Investigations into the Role of 4,5-Diazafluorenone in Aerobic Palladium Catalyzed Oxidations

Johnson, Britta (Sibert)

Molecular Vibrations as a Probe of Complex Coupling in the Gas and Condensed Phase

Jones, Bradley (Landis)

Implementation of Asymmetric Hydroformylation with Rhodium Bisdiazaphos Catalysts: AHF in Flow and Rh-Catalyzed Hydroacylation

Kain, Schuyler (Wright)

Transition of Frequency-Domain Coherent Multidimensional Spectroscopic Methods to the Femtosecond Time Regime with Applications to Nanoscale Semiconductors

Knoener, Rachel (Smith)

HyPR-MS for Multiplexed and Splice Variant-Specific Discovery of RNA-Protein Interactomes

Kreidler, Dale (Gellman)

Structural Insights into Unnatural Proteins from Symmetry and Pseudosymmetry

Lu, Xiya (Cui)

Parameterization of DFTB3 and Applications in Studying Enzymatic Mechanism with QM/MM Free Energy Simulations

Marquard, Angela (Goldsmith)

Synthesis, Immobilization Strategies, and Mechanistic Analysis of Surface-Supported Molecular Palladium Cross-Coupling Catalysts for Single-Molecule Fluorescence Spectroscopy

McCann, Scott (Stahl)

Mechanistic Studies of Cu-Catalyzed Aerobic Oxidation Reactions: Aerobic Alcohol Oxidation and Phenol Oxidation Reactions Involving Cooperative Catalysis

McDonough, Thomas (Zanni)

Probing Exciton and Charge Dynamics in Organic Thin Films and Photovoltaics with Nonlinear Spectroscopy

Mensch, Arielle (Hamers)

Characterizing Nanoparticle Interactions at the Cellular Membrane with in situ Analytical Methods

Merrill, Wyatt (Crim)

Unimolecular Photodissociation Studies in Molecular Beams and Flow Tubes

Miles, Kelsey (Stahl)

Aerobic and Electrochemical Oxidations with N-Oxyl Reagents

Mueller, Philipp (Hermans)

Modulation Excitation Spectroscopy Applied on Heterogeneous Lewis Acid Catalysis

Rana, Ambar (Strieter)

From in vitro Conformational Dynamics of Ubiquitin Oligomers to Global Dynamics of Ubiquitin Chains in Cells

Robinson, Margaret (Hamers)

Background-Free Imaging of Nanoparticles

Ruan, Shigang (Lian Yu)

Surface Mobility of Organic Glasses Probed by Nano-Particles and Nano-Holes

Samad, Leith (Jin)

Composition and Morphology Control of Metal Dichalcogenides via Chemical Vapor Deposition for Photovoltaic and Nanoelectronic Applications

Scamp, Ryan Joseph (Schomaker)

Enhancing Selectivity and Tunability of Nitrene Transfer Reactions through the Coordinative Malleability of Silver Complexes

Schmid, Steven (Schomaker)

Part 1: Developments in 1,3-Halogen Migration. Part 2: Ring-Expansion Reactions of Methylene Aziridines.

Scholz, Spencer (Yoon)

Strategies for the Development of Triplet Sensitized Cycloadditions with Transition Metal Photosensitizers

Shaloski, Michael (Nathanson)

DCI and N<sub>2</sub>O<sub>5</sub> Chemistry at the Salty Glycerol Surface: Impact of Surfactants on Transport and Reactivity

Skubi, Kazimer (Yoon)

New Strategies for Catalytic Stereocontrol in Photochemical Synthesis



Photo by Tatum Lyles Flick

Graduate student participants in the 2018 Department of Chemistry Graduation Celebration

Slaymaker, Laura (Hamers)

Surface Modifications of Novel Electroactive Materials for Applications in Lithium-Ion Batteries and Water Purification

Son, Chang Yun (Yethiraj)

Expanding the Space-Time Resolution of Molecular Dynamics studies of Condensed Phases -- For Ionic Liquids, Polymers and Bio-mol

Stracey, Nuru (Brunold)

Spectroscopic and Computational Studies of Fe and Mn Enzyme Mimics, B12 Biosynthesis, and B12-Dependent Dehalogenases

Tylinski, Michael (Ediger)

Investigating the Kinetic Stability and Transformation of Vapor-Deposited Glasses with AC Nanocalorimetry Experiments

Van Vleet, Mary (Schmidt)

New Functional Forms and Parameterization Methods for Ab Initio, Intermolecular Force Field Development: Theory and Application

Vinokur, Anastasiya (Fredrickson)

Bonding Networks in Intermetallic Systems: Effects of Optimization, Cooperation, and Competition on Properties

Walters, Diane (Ediger)

Anisotropic Molecular Orientation and Enhanced Thermal Stability in Vapor-Deposited Glasses of Organic Semiconductors

Wang, Dian (Stahl)

Mechanistic Studies and Catalyst Development of Palladium-Catalyzed Aerobic C-H Oxidations of (Hetero)aromatics

Wildt, Julia (Landis)

Novel 3,4-Diazaphospholane Ligands: Synthesis and Investigation in Rhodium-Catalyzed Hydroformylation

Wilkerson, Emily (Coon)

Method Optimization and Application of Mass Spectrometry to the Field of Hematology

Winton, Valerie (Kiessling)

Inhibitors of UDP-Galactopyranose Mutase

Yannello, Vincent (Fredrickson)

Electron Counting in Polar Intermetallics: The Reversed Approximation MO Method and the 18-n rule

Zhu, Men (Lian Yu)

Polyamorphism of D-mannitol and Trans-Cis Isomerization Energies of Azopyridines

## Ph.D. (2018)

Appadoo, Visham (Lynn)

Surface-Mediated Release and Transfer of Plasmid DNA Using Polyelectrolyte Multilayer Coatings

Brezny, Anna Christine (Landis)

Kinetic and Mechanistic Studies of Rh(Bis(diazaphospholane))-Catalyzed Asymmetric Hydroformylation

Buchberger Jones, Amanda Rae (Li)

Development and Application of Quantitative and Qualitative Mass Spectrometry Techniques to Probe Crustacean Neuropeptides and Beyond

Chen, Zhengwei Tony (Li)

Advancing Mass Spectrometry Methods for Glycosylation Analysis and their Application to Disease-Related Glyco-Alteration Study

Cheng, Nongyi (Hamers)

Vapor-Deposited Soft Electronic Materials and Their Applications

Crowe, Sean O (Strieter)

Towards Understanding the Role of Branched Ubiquitin Chains in Cellular Signaling

Fleetwood, Michelle Catherine (Mecozzi)

Design, Synthesis and Characterization of Benign Semifluorinated Polymers for the Delivery of Hydrophobic Pharmaceuticals

Fu, Yongping (Jin)

Metal Halide Perovskite Nanostructures for Optoelectronic Applications and Fundamental Studies

Grant, Joseph (Hermans)

Discovery and Development of Heterogeneous Catalysts for the Oxidative Dehydrogenation of Light Alkanes

Handali, Jonathan D (Wright)

3D Triply Resonant Sum Frequency Spectroscopy with Applications Towards Biological Molecules

Hermes, Eric (Schmidt)

Realistic Models for Theoretical Studies of Heterogeneous Catalysis

Ho, Jia-Jung (Zanni)

Surface Specific Multidimensional Spectroscopy and its Theoretical Modeling

Hodges, Heather (Kiessling)

Probing Bacterial Signaling and Cell Envelope Assembly with Chemical Reporters

Jackson, Grayson (Mahanthappa)

Nanoconfined Water and Water-mediated Ion Transport in Lyotropic Liquid Crystalline Membranes

Kregel, Steven John (Garand)

Construction of an Anion Photoelectron Spectrometer for Investigating Singlet Fission in Molecular Clusters

Lupo, Katherine Marie (Goldsmith)

Studying Heterogeneity of Chemical Reactions via Single-Molecule Fluorescence

Manger, Lydia Helen (Goldsmith)

Fluorescence Anisotropy Measurements of Single Molecules to Probe Solution-Phase Conformational Heterogeneity of Intrinsically Disordered Proteins

Mohapatra, Sonisilpa (Weisshaar)

Functional Mapping of the Components of the E. coli Translational Machinery

Pakula, Ryan Justin (Berry)

Novel Multimetallic Structures and their Properties, including Applications in Carbene and Nitrene C-H Functionalization

Qiu, Yue (Ediger)

Modulation of Chemical Reactions by Glass Packing

Riley, Nicholas M (Coon)

Advancing Electron Transfer Dissociation Technologies for Characterization of Proteomes and Post Translational Modifications

Rush, Matthew John (Coon)

The Development and Implementation of Mass Spectrometry Methods for the Characterization of Peptides, Proteins, and Metabolites

Shearer, Melinda Jean (Jin)

Correlating Spatial Heterogeneity with Electronic and Optical Properties of Transition Metal Dichalcogenides

Stolt, Matthew John (Jin)

Observation and Electrical Detection of Magnetic Skyrmions in Iron Germanide Nanostructures

Thayer, Mitchell Paul (Bertram & Keutsch)

New Tools for Atmospheric Chemistry Utilizing Machine Learning on Field Measurements

Thomas, Nicole Christine (Gellman)

X-Ray Crystallography as a Tool for the Structural Study and Design of  $\alpha/\beta$ -Peptides

Thompson, Blaise Jonathan (Wright)

Development of Frequency Domain Multidimensional Spectroscopy with Applications in Semiconductor Photophysics

Voss, Jonathan Mark (Garand)

Developing Cryogenic Ion Vibrational Spectroscopy Methods for the Characterization of Molecular Interactions

Xiu, Lichen (Jin)

Development of New Materials and Chromatographic Methods for Top-Down Proteomics

Yang, Tzuhsiung Nick (Berry)

Electronic and Steric Effect on Transition Metal Catalyzed Group Transfer Reactions: Paving the Road to High Throughput Virtual Screening of Catalysts

Yang, Tian (Blackwell)

The Development and Application of Chemical Tools to Study Quorum Sensing in *Staphylococci*

Yang, Zhilin (Weisshaar)

Single-Cell, Real-Time Detection of Antimicrobial Peptide's Attack in Live *E. coli* Cells

**M.S. (2016)**

Dones-Monroig, Jesus M. (Raines)  
 Evens, Kaarin (Zanni)  
 Graham, Brian (Raines)  
 Ho, Jordan Sun (Kiessling)  
 Jarvis, Cassie (Kiessling)  
 Kruger, Austin (Kiessling)  
 Long, Charnell (Kiessling)  
 Pollock, Benjamin (McMahon)  
 Ressler, Valerie (Raines)  
 Tao, Minshan (Hamers)

**M.S. (2017)**

Alvarez, Catherine (Hamers)  
 Calabretta, Phillip J (Kiessling)  
 Flikweert, Niccia Elizabeth (Yoon)  
 Hagee, Eric Joseph (Wright)  
 Haveman, Matthew (Jin)  
 Jin, Haiyun (Cui)  
 Louthan, Kirsten (Hamers)  
 Manulik, Joseph (Blackwell)  
 Neff-Mallon, Nathan (Wright)  
 Orgren, Lindsey Renee (Raines)  
 Pal, Tanmoy (Cui)  
 Pinhancos, Rebeca (Burstyn)  
 Schwarz, Cara (McMahon)

**M.S. (2018)**

Camacho, Beatriz (Denu)  
 Herman, Madeline Irene (Yoon)  
 Lamb, Brandon (Jin)  
 Werner, Stephanie (Jin)  
 Whitmire, Lauren Diane (Stahl)

**B.S./B.A. (2016)**

Baehman, Bradley  
 Bernabo, Rebecca  
 Frey, Austin  
 Gonzalez, Pilar  
 Gulas, Kyle  
 Hampel, Nicholas  
 Hatfield, Adam  
 Huff, Austin  
 Kraft, Joseph\*  
 Krawczyk, Andy  
 Mechler-Hickson, Alexandra\*  
 Newman, Eugene Kenneth  
 Ridl, Tyler  
 Uphues, Patrick  
 Van Berkom, Anna  
 Zhou, Hao

**B.S./B.A. (2017)**

Amatuni, Alexander  
 Artymiuk, Jacklyn  
 Bagley, Taite  
 Bailey, Kevin  
 Berendt, Amelia  
 Bourgeois, Shay  
 Brabant, Elliott  
 Caschetta, Claire  
 Casper, Lucas  
 Casperson, Kurtis  
 Cheng, Queenie  
 Combs, Joshua\*  
 Cooley, Victoria  
 Cornejo, Natasha  
 De La Villefromoy, Luc  
 Dobraska, Brandon  
 Earley, Justin  
 Edge, Devin  
 Foth, Nicholas  
 French, Samuel  
 Goossen, Nicolas Brian  
 Hagemann, Margeaux  
 Hallfrisch, Ashley  
 Heim, Zachary\*  
 Hillert, Conor  
 Hinkel, Liv  
 Jaeger, Riley  
 Jambor, Alexander  
 Kasten, Jared  
 Kim, David  
 Kladar, Ryan  
 Klapper, Lily M.  
 Lang, Eric  
 Lange, Josephine  
 Lee, Jeehyeon  
 Leng, Will  
 Liang, Yu  
 Lyu, Haoxiang  
 Mades, Isaac  
 Mandel, Jeremy  
 Mark, Dan  
 Mat Lani, Amirah Syamila  
 Mcconeghy, Nicholas  
 Meyer, Madeleine  
 Miyazaki, Ken  
 Negrete, Gabriela  
 Nowakowski, Hannah  
 O'Connell, Ben  
 O'Rourke, James  
 Ordonez Arteaga, Estela  
 Janeth  
 Padilla, Nicolas  
 Renard, Landon  
 Saito, Anna  
 Saler, Lauren  
 Scammell, Ian

Schlafmann, Kyle  
 Schnabel, Brandon  
 Schwartz, Stephen  
 Shah, Sohil\*  
 Sheffer, Bradley  
 Simon, Jessica  
 Tian, Jordan  
 Van Boxtel, Matthew  
 Van Domelen, Benjamin  
 Walcott, Owen  
 Wiesman, Andrew  
 Xavier, Kenneth  
 Xu, Xuanqi  
 Yao, Yao\*  
 Yegorov, Viktor  
 Zemela, Mark\*  
 Zhang, Bo  
 Zhang, Johnny Yi  
 Zhao, Jingyi  
 Zong, Yixu

**B.S./B.A. (2018)**

Balzer, Paul  
 Buchinger, Derek  
 Chemello, Michael  
 Corstvet, Joseph  
 Daniels, Joshua  
 Dillahunt, Anya  
 Eccles, Liam  
 Eichten, Alison  
 Evans, Elizabeth Jane  
 Ferrer, Brian\*  
 Fetsch, Karl  
 Fitzsimmons, Ryan  
 Foy, Michael\*  
 Gao, Tianhua  
 Geisler, Emmett  
 Gomez, Anthony

Guajardo, Pedro  
 Heim, RJ  
 Hinkforth, Brett  
 Horein, Alice  
 Husman, Anna  
 Jodts, Richard  
 Keita, Hawa  
 Koerner, Bethany  
 Krohn, David  
 Lind, Mark  
 Maloney, Garrett  
 McCrary, Mark  
 Milbauer, Michael  
 Miller, Mackenzie  
 Noten, Efrey Alex\*  
 Oxtoby, Lucas\*  
 Pan, Ziyi  
 Robitaille, Ryan  
 Ross, Cullen  
 Sadecki, Patric  
 Schultz, August  
 Simek, Chelsea  
 Sorensen, Stephanie  
 Springer, Sean  
 Tessling, Anna  
 Thompson, Hailey  
 Visser, Nicholas  
 Wallace, Nathaniel  
 Witta, Beth  
 Wood, Jamie\*  
 Wright, John  
 Yaeger-Weiss, Susanna\*  
 Yin, Boyu  
 Zhang, Hanyuan



Photo by Tatum Lyles Flick

Undergraduate participants in the 2018 Department of Chemistry Graduation Celebration

\* Graduated with honors.

NOTE: Students listed from past years were not included in the last issue of *Badger Chemist*.

**FIND MORE GRAD PHOTOS ONLINE AT  
 BADGERCHEMISTNEWS.CHEM.WISC.EDU**



# Department Welcomes New Faculty & Staff

## NEW FACULTY

### AJ Boydston

Associate Professor of Chemistry &  
Yamamoto Family Professor of Chemistry



AJ Boydston

In August 2018, AJ Boydston joined the department. He brought research scientist Dr. Chang-Uk Lee and students Johanna Schwartz and Brock Lynde with him from the University of Washington, as part of his group.

His group works primarily on organic and polymer chemistry.

Boydston received his BS in 2001 and MS in 2002 from the University of Oregon and his Ph.D. in 2007 from the University of Texas. He held a postdoctoral position at the California Institute of Technology.

### WHY DID YOU CHOOSE UW-MADISON?

It was clear that the University has a commitment to excellence. This is true in all aspects: identity, teaching, research, outreach, mentorship, and citizenship. It's not surprising to me that so many departments earn high rankings. The students, staff, and faculty push hard and support one another. I was eager to become part of that. There were also several examples of interdisciplinary, collaborative research across campus. That's exciting to me because I think some of the best innovations happen at the interface of traditional areas. Additionally, students will be better prepared to take on new challenges when they've had to broaden their thinking during training.

### WHAT MADE YOU PURSUE SCIENCE AND RESEARCH?

I fell in love with organic chemistry as an undergraduate. Prior to that, I really didn't have any significant familiarity with chemistry. My undergraduate experience at the University of Oregon really changed my life. It helped me uncover

my obsession for problem-solving and I was inspired by the creative license that organic chemistry offered. I decided to go into research once I saw my undergraduate research advisor, Prof. Mike Haley, running his lab and helping Ph.D. students mature into scientific leaders. I wanted that. Then, I had other great mentors and role models, like Prof. Chris Bielawski, Prof. Grant Willson, and Prof. Bob Grubbs, who challenged and encouraged me along the way. Across each of my past advisors, I was fascinated by their ability to envision function, design molecular scaffolds to access that function, and then test hypotheses associated with their designs. It really impressed upon me the excitement of spanning chemical synthesis and applied research.

### Zachary Wickens

Assistant Professor of Chemistry

Assistant Professor Zachary Wickens arrived at UW-Madison in June 2018. His group, which currently includes postdoctoral researcher Nicholas Cowper and graduate student Oliver Williams, works to discover new ways to control reactions and selectively break apart and reassemble small molecules.

Wickens received his bachelor's degree at Macalester College in Saint Paul, MN and his Ph.D. at the California Institute of Technology. He was most recently a National Institutes of Health postdoctoral fellow at Harvard University.



Zachary Wickens

### WHY DID YOU CHOOSE UW-MADISON?

One of the biggest reasons I decided to come to UW was to work with the caliber of students I knew I'd have the opportunity to interact with, both in the class and in my lab. The institution has a reputation for fostering creative science and I've known many fantastic scientists who received degrees from UW-Madison. Additionally, I was born and

raised in Madison and I knew it was an awesome place to live.

### DO YOU HAVE ANY BIG GOALS FOR THE BEGINNING OF YOUR TIME IN THE DEPARTMENT?

In addition to getting my research off the ground, I am developing a new class aimed at helping new graduate students develop scientific thinking in organic chemistry. I am fascinated by innovation and the way people think about problems. In this class, I have focused more on the thought process necessary to be a successful scientist than on specific content. My goal for the class is to scaffold the development of independence by providing a structured classroom environment to facilitate the transition into a graduate education. In undergraduate education, students learn what humans already know, but in graduate school, they learn to *create* brand-new knowledge. This distinction requires a significant shift in thinking and can be extremely jarring for many students.

Brilliant young scientists come into our program with pretty different previous experience and knowledge. With this in mind, the first half of the course is about equipping each and every student with the intellectual vocabulary to articulate scientific questions in organic chemistry. The second part puts students in situations where there might not be any known answer. I teach them to deal with that situation and come up with the questions to ask to get to an answer. While my class focuses on problem solving in a specific area of scientific inquiry, my goal is that they can leverage the thought process they learn in my course to answer other scientific questions.

An unexpected but happy by-product of the way I've structured this course is that many of the students have started to realize that each of them has different strengths and weaknesses, and that by working together with diverse approaches to the same problem, they can come to more satisfying answers. I hope this has a lasting impact on how students interact with each other in research environments, as well.

## Andrew Buller

Assistant Professor of Chemistry

During the summer of 2017, Andrew Buller joined the department as assistant professor of chemistry. His group includes graduate students: Jon Ellis, Prasanth Kumar, Allwin McDonald, and Lydia Perkins. The group's research is focused on protein engineering, biocatalysis, enzymology, and chemical biology.

Previously, he worked as a National Institutes of Health Ruth L. Kirschstein NRSA Postdoctoral Fellow in the Francis Arnold research group at California Institute of Technology. He has a doctorate in molecular biophysics from Johns Hopkins University and bachelor's degrees in biochemistry and mathematics from the University of Iowa.



Andrew Buller

### WHY DID YOU CHOOSE UW-MADISON?

The people! I knew from reading papers that the science at UW-Madison was excellent, but it was meeting the faculty, staff, and students that really made me excited to start my independent career in this warm and collaborative atmosphere.

### WHAT CAN STUDENTS EXPECT FROM YOU IN THE CLASS OR LAB?

Good science requires creativity and tenacity. I suspect UW-Madison students have the tenacity part down pretty well, but it can be very hard to think creatively if you're afraid of being wrong. I hope to foster an open and inviting environment in the classroom and in the lab where everyone is welcome to participate, and we can learn from each other.

### WHEN DID YOU KNOW YOU WANTED TO BE A SCIENTIST?

My sophomore year of college. Maybe that's a little late for most people, but I had initially enrolled at the University of Iowa with the intention of becoming an elementary school teacher. My dad and brother, who are both chemists, encour-

aged me to take some core science classes, too, and once I started, it was hard to stop. Sophomore year I took organic chemistry from a marvelous lecturer, Professor Amnon Kohen. I loved learning the logic of the subject and the rest was history.

## Daniel Weix

Associate Professor of Chemistry & Wayland E. Noland Distinguished Chair in Chemistry

Daniel Weix joined the department during the summer of 2017. His group includes postdocs: Michael Gilbert, Kai Kang, and Jiang Wang. It also includes graduate students: Michelle Akana, Daniel Enny, Kevin Garcia, Keywan Johnson, Seoyoung Kim, Victoria Longley, Brett Schneider, and Amanda Spiewak. Their research is focused on cross-electrophile coupling, nickel catalysis, cross-coupling of organic radicals and cooperative multimetallic catalysis.

Previously, he worked as an associate professor of chemistry at the University of Rochester. He has a Ph.D. from the University of California, Berkeley



Daniel Weix

and a bachelor's degree from Columbia University. He completed postdoctoral fellowships at Yale University and University of Illinois at Urbana-Champaign.

### WHAT DO YOU LIKE BEST ABOUT CHEMISTRY?

I love the unusual — the examples that, at first, look like exceptions, but upon later review can be explained. I also have a love for demonstrations and large-scale synthesis.

### WHEN DID YOU KNOW YOU WANTED TO BE A SCIENTIST?

As a young child, I never considered it as a career — I didn't know anyone who worked in research and had no concept of what a scientist really was. The change came in high school. I always enjoyed the sciences, but AP chemistry in high school came as a revelation. I was riveted by lectures and creative demonstrations. Because I also enjoyed biology, I entered college thinking about biochemistry, but, again, amazing instructors (Nick and Tom) changed my path. I could not believe how fun organic chemistry was! That very year I started working in Nick's labs, and never looked back.

READ THE FULL STORIES ONLINE AT  
[BADGERCHEMISTNEWS.CHEM.WISC.EDU](http://BADGERCHEMISTNEWS.CHEM.WISC.EDU)

### NEW STAFF (2017-2018)

Beatriz E Bolanos Lemire  
Aubrey J Ellison  
Hailey L Johnson  
Spring Melody M Knapp  
Mary Carol Hanson  
Jia Zhou  
Blaise J Thompson  
Ross Russell Bishop  
Paul Hooker  
Kathryn L McCullough  
Liana B Lamont  
Lindy K Stoll  
Tatum Lyles Flick  
Kurtis M Casperson  
Marc E Willadsen  
Dominic M Colosi

Path Coordinator  
Assistant Organic Lab Director  
Financial Specialist  
Stahl Lab Manager  
Path Coordinator  
REACH Faculty Assistant  
Instrumentation Technologist  
Laboratory Technician  
Senior Lecturer  
Student Services Coordinator  
Gen Chem Instructional Coordinator  
Gen Chem Curriculum Coordinator  
Communications Specialist  
Laboratory Technician  
Payroll & Benefits Specialist Advanced  
Laboratory Technician



# COMING SOON

## A NEW CHEMISTRY BUILDING



New atrium at University Avenue and Mills Street.

*By John Moore & Bob McMahon, project leaders*

Earlier this year, the State Building Commission approved an increased budget of \$133.1 million for the Chemistry Building Project, the project went out for bids, and Miron Construction became general contractor. Groundbreaking took place on September 14 and construction is now under way.

That is a huge milestone in progress toward improving department facilities. The project includes a new nine-story tower; renovation of the basement, first, and second floors of the Daniels wing; extensive mechanical upgrades to existing buildings; and important safety upgrades. These additions and renovations will impact our department and our students, as well as students from numerous other disciplines, including medicine, dentistry, pharmacy, nursing, veterinary medicine, biotechnology, engineering, and biology.

Getting to this point and going from here to completion of the project represents a huge collaborative effort on the part of our department, the architectural design team, the University, and the state. That collaboration ultimately will span more than a decade.

It began in 2010 with a Space Assessment and Feasibility Study that had input from the entire department and was completed by Aro Eberle and Ballinger architects. It continued through the preliminary

and final design carried out by Strang and Ballinger architects with major input from faculty and instructional staff. It will culminate with completion of the project by Miron Construction.

The chancellor of UW–Madison, the president of the UW Foundation, the dean of L&S, the UW System, in collaboration with the State of Wisconsin, have all helped develop and fund this much-needed project.

Generous contributions have been received from friends of the campus and the department, chemistry alumni, and current and emeritus members of the faculty and staff. We thank everyone for bringing us to the beginning of a new era!

The new facilities will enhance our department's excellent program of undergraduate chemistry education, especially our trend toward active/collaborative learning. The learning studio will be in great demand for active-learning classes and will support the REACH program, a transformational

pedagogical initiative described in last year's Badger Chemist (available online at [badgerchemistnews.chem.wisc.edu](http://badgerchemistnews.chem.wisc.edu)). The information commons is a harbinger of libraries to come.

Demolition and construction are coming at an opportune time. During the next five years, the UW–Madison will significantly increase undergraduate enrollment and 55 percent of UW–Madison undergraduate students



Chairs from a lecture hall are the first to go, as construction begins.

Photo by Tatum Lyles Flickr





Photo by John Moore

Analytical Chemistry courses are currently using these temporary facilities in the Medical Sciences Center.

take at least one chemistry course, so our enrollments will continue their three-decade upward trend. The construction/renovation project will afford a much-needed 67 percent increase in organic lab space and more than 50 percent increase in general chemistry lab space. There will be more Badger Chemists in the future!

We are excited that construction of the new building is underway, but change is never simple. For the next three years, parts of our instructional program will be in temporary quarters. Analytical labs have already moved to renovated space across University Avenue in the Medical Sciences Center (MSC) (see photo) and many chemistry lectures are being given in rooms 10 minutes away from our building. When the analytical floor in the new tower is complete, analytical will move to the tower. Part of the general chemistry program will move to the MSC and part will use what will eventually be the physical/advanced analytical laboratories in the new tower. By 2022, we expect that everyone will be in new labs, including some renovated general chemistry labs and a new home for the Chemistry Learning Center in the MSC. Between now and then lots of things will be in flux!

## Stay up-to-date on the **CONSTRUCTION**

with photos, stories, links to news coverage and more, at  
Badger Chemist News Online



### CHEMISTRY BUILDING PROJECT

[PROJECT OVERVIEW >](#)

[WEEKLY UPDATES >](#)

[CONSTRUCTION PHOTOS >](#)

READ THE FULL STORIES ONLINE AT  
[BADGERCHEMISTNEWS.CHEM.WISC.EDU](http://BADGERCHEMISTNEWS.CHEM.WISC.EDU)

## NEW & IMPROVED!

When construction and renovation are complete, we will have these improvements:

### NEW INSTRUCTIONAL LABORATORIES

each with an adjacent write-up room, for all undergraduate courses—general, organic, analytical, inorganic, and physical chemistry

### ADVANCED SYNTHETIC CHEMISTRY LAB

### UNDERGRAD SPECIAL PROJECTS LAB

### STATE-OF-THE-ART LECTURE ROOMS

to facilitate small-group interactions and with enhanced lecture-demo and AV capabilities

### FLEXIBLE SEATING

classrooms and write-up rooms equipped with flexible seating to support active learning

### MULTIPURPOSE LEARNING STUDIO

to explore new and better ways to teach and to serve as a poster sessions and reception venue

### LARGE ATRIUM & OTHER SPACES

where students can study and interact informally

### INFORMATION COMMONS

to pioneer the future facilities plan of the university library system

### IMPROVED OFFICES & MEETING ROOMS

to support staff, advising, and instruction

### SAFETY FEATURES

much-needed improvements in air supply and exhaust systems for research labs in Mathews and Daniels wings, a new fire-alarm system coordinating all four wings of the chemistry complex, and fire sprinklers and fire doors in Mathews and Daniels that improve research-lab safety

# **GROUNDBREAKING** *celebrates* **NEW CHAPTER FOR DEPARTMENT FACILITIES**

Department faculty, staff and students kicked off construction September 14 with a groundbreaking ceremony, on the 20-year anniversary of the Shain Tower groundbreaking. The new \$133 million project will include major renovations, safety features and a new building.

Speakers included: Rebecca Blank, UW–Madison chancellor; Karl Scholz, College of Letters & Science dean; Judith Burstyn, Department of Chemistry chair; and Robert McMahon, chemistry professor and building committee co-chair.

Lead contractor, Miron Construction, was also at the celebration, as were several donors, city and state representatives, UW Foundation representatives and university administrators.



The University Avenue side of the Chemistry Complex will be rebuilt to accommodate advanced educational techniques. Construction began September 2018.



Erik Iverson, Mike Knetter, David Smukowski and Karl Scholz enjoy catching up before the groundbreaking ceremony.



Robert McMahon speaks to attendees of the groundbreaking ceremony.



Many donors helped make this event possible, including (from left): Tashia and John Morgridge, Mike and Mary Sue Shannon, and Ted Kellner (Mary Kellner, not pictured).



Karl Scholz, Chancellor Blank, Ted Kellner, and Erik Iverson break ground.



Department of Chemistry staff and faculty attend to celebrate the department's progress.



A department hard hat sits atop the first lecture hall to be demolished.

Photos on this page by Sarah Maughan



# New funding means acquisition of STATE-OF-THE-ART SOLID-STATE NMR INSTRUMENTATION

Enabling Characterization of Nanoparticles, Catalysts, Other Novel Materials, and Biochemical Systems

By Charlie Fry

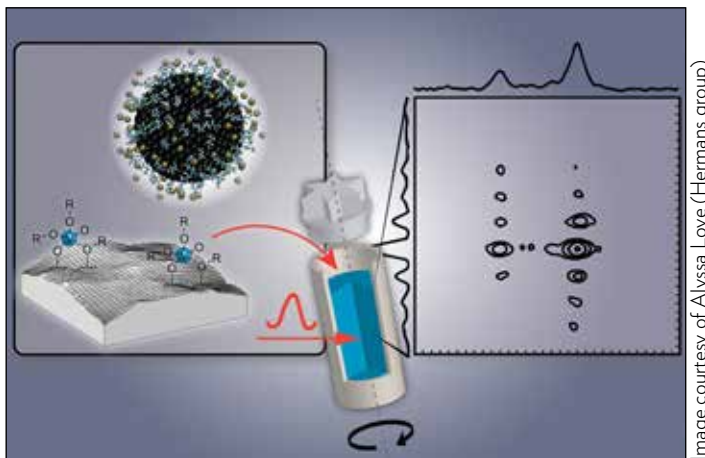
Director of Dir NMR Lab - CIC

UW–Madison ranks as a premiere institution in the world for research support involving nuclear magnetic resonance (NMR) spectroscopy, but nearly all of UW–Madison's capabilities are directed at liquid samples. Solid-state nuclear magnetic resonance (SSNMR) can analyze materials in solid or semi-solid states, which requires different technology and instrumentation from conventional NMR that uses liquid.

The Department of Chemistry, led by Prof. Ivo Hermans and Drs. Charlie Fry and Lingchao Zhu, won highly competitive UW2020 funding to gain state-of-the-art SSNMR capabilities.

The new instrumentation will support nanoparticle, catalysis, and other critical materials research areas, paving the way for many important measurements. An example is the straightforward identification of surface coverage of functionalized nanoparticles. Nanoparticle research is one of the fastest-growing areas in the Department of Chemistry and about campus. The determination of surface coverage, assessing chemical functionalization, defining interactions with proteins and lipids, and measuring surface dynamics are fundamentally important to this very competitive research area.

The new research opened up by this acquisition promise to impact many areas, from medical treatments of cancer and other diseases, to catalysis, electrochemistry, fuel cells and advanced batteries, medical diagnostics, and more. The SSNMR will also enhance the training of graduate and post-doctoral students in Chemistry.



Our new capabilities include:

## Doty 4mm 1H/X/Y DSI MAS probe

This unique probe combines relatively large sample volume for best sensitivity, and the ability to tune to all magnetically active nuclei. It can acquire both traditional cross-polarization magic-angle-spinning (CP/MAS) and high-resolution magic-angle (HR-MAS) spectra, making it unique in being able to work with solid as well as semi-solid, gel and liquids materials. It has a very high-performance magic-angle gradient, for HR-MAS and diffusivity measurements on high molecular weight compounds.

## Phoenix 1.2mm 1H/X/Y MAS probe

The smaller diameter sample volume enables fast magic-angle spinning. This probe will allow  $^1\text{H}$ -detected X (e.g.,  $^{13}\text{C}$ ,  $^{31}\text{P}$ ,  $^{51}\text{V}$ ,  $^{14}\text{N}$ ,  $^{39}\text{K}$ ,  $^{109}\text{Ag}$ ) spectra to be acquired. This will enhance sensitivity enormously, and enables much improved access to resolved  $^1\text{H}$  information in the solid-state.

## Learning a unique skill in

# GLASS BLOWING CLASS

Students and postdocs learn to create glassware from master glassblower.



Daniel Hinton (Goldsmith) and  
Andrew Cavell (Goldsmith)



Ariel Alperstein (Zanni) and  
Vanessa Orr (McMahon)



Ying Yang (Jin) and  
Jill Chipman (Berry)



Master Glassblower Tracy Drier  
and Vanessa Orr (McMahon)

Photos by Tatum Lyles Flick

# a creative GROUP RECRUITMENT TRADITION

By Kaitlyn M. Moore  
Department  
Communications

At the start of each fall semester, the Department of Chemistry welcomes incoming graduate students with the responsibility of choosing a research group — and creative posters have become the quintessential tool for lab group recruiting.

According to Arrietta Clauss, graduate student services coordinator, this can be a demanding time for students and faculty, and what better to relieve tension than by making some chemistry puns?

During orientation, faculty members give 15-minute presentations about their research. Then students start rotations, which is a process that helps them gain exposure to different research groups and faculty.

“Each rotation is a three-week period that puts students in a faculty member’s lab,” says Clauss. “Some faculty have them endure a little wet chemistry, a little research, and some faculty just have them read articles, but they have a desk in that lab, and they kind of see how the lab is run. They get to feel the climate or the character of the lab.”

Because there are only three rotations, students must also attend at least two other group meetings or open houses. This process helps them narrow their choices down to three to five labs for group joining.

“As one faculty said ‘finding a group should be like a funnel, students start out broadly, and then, as they begin to understand more about the research and more about the groups, they start narrowing it down,’ so I hope students would look at maybe 10 labs,” says Clauss.

As first-year students search for a lab

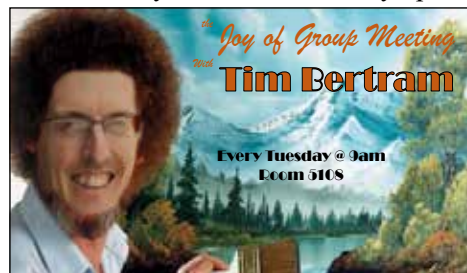


Each lab group designs a unique poster to show the lab’s personality to potential first-year recruits. Pictured above, from left: Cavagnero Group, designed by Natalie Feider, undergraduate student researcher; Yoon Group, designed by Evan Sherbrook, graduate student, and Hermans Group, designed by William McDermott, graduate student.

to join, current graduate students come together to cultivate these witty flyers that portray the personality in their lab to encourage new students to attend their open houses and group meetings.

The posters are lighthearted, creative, and full of chemistry puns that relate to each professor’s research.

“Students display a lot of creativity, and it’s really fun for them,” says pro-



Graduate student Chris Jernigan, from the Bertram group, designed a poster on painter, TV personality and art instructor Bob Ross.

fessor Silvia Cavagnero, whose group took on the theme of protein folding for this year’s poster.

Although the main function is to promote participation in group meetings, these works of art also represent the labs’ personalities.

“I think the posters are a good way for the group to present to potential first-year recruits,” says William McDermott, a fourth-year graduate student in the Hermans group, “they show the kind of personalities we have in the group and the kind of jokes we like to make or how fun we are.”

It is important for students to find a group that matches their work style because each group operates differently. Once placed in a lab, they typically remain there for the duration of their time as a graduate student.

“Do you remember that scene in the movie 101 Dalmatians toward the beginning where they have the ladies exploring town with their dogs, and the dogs look a little bit like the ladies?” Cavagnero asked. “It’s a little bit like this in a group. The faculty member’s personality sometimes extends to the students, who want some affinity, not just in their chemistry interests, but also in the way they view science and in how they interact with each other.”

This yearly event is fun for group members, and it brings the department together to enjoy the creativity and humor that goes into the posters.

“I look at them because they’re so darn funny,” says Clauss, “I think all of us look forward to seeing those posters. They serve a function for the first-year students, but for the rest of the department it is a source of entertainment — they are funny and uplifting.”



# Life in the lab of a LAUREATE

## WHAT IT WAS LIKE WORKING WITH FRANCES ARNOLD

By Stephanie Blaszczyk  
Science Communicator &  
Graduate Student (Tang Group)

UW–Madison students are unknowingly influenced by recent 2018 Nobel Prize in Chemistry winner, Frances Arnold, thanks to four Ph.D. chemists and Arnold group alumni in the Madison area: Jeffrey Endelman (2005), Philip Romero (2012), and Andrew Buller (2017), all professors at UW–Madison, and Katie Brenner (2009) co-founder of bluDiagnostics, a biomedical company.

Though Frances Arnold has been a known commodity in academia for more than 20 years, her 2018 Nobel Prize in Chemistry for the directed evolution of enzymes made her a household name. Arnold is the Linus Pauling Professor of Chemical Engineering, Bioengineering, and Biochemistry at the California Institute of Technology.

The local lab alumni largely echo the same sentiments when describing life in the lab of a (now) Nobel Laureate.

Like troops under the guidance of a general from afar, they worked diligently and independently as Arnold was largely absent from day-to-day interactions.

“Graduate school is very challenging,” Brenner said. “Frances expects her students to learn quickly to meet extremely high standards. Long-term, you see that her high expectations prepared you really well for your next steps: her training humbled you, and then built you back up. It was like science boot camp.”

Students relied on fellow lab mates to navigate this uncomfortable time, and they often bonded over these shared experiences. What many students failed to realize, however, was that Arnold was more observant than they thought. In one instance, Arnold called Brenner to her office sensing something was amiss. It was at this moment that Brenner saw a glimpse of Arnold’s kind, compassion-



Photo courtesy of Jeffrey Endelman

Ph.D. chemists Katie Brenner, Andrew Buller, Jeffrey Endelman and Philip Romero celebrate their mentor’s success, after learning that Frances Arnold received the 2018 Nobel Prize in Chemistry.

ate nature.

While difficult in the moment, Brenner is grateful for time and learning that occurred in Arnold’s lab. It taught her how to be a rigorous scientist, which has carried over to her career in R&D.

When I asked what type of lab environment she tried to provide for her students, Arnold responded, “Honestly, the best lab environment is one where great lab members run the show and help each other do their best work.”

All four alumni undoubtedly performed great work in Arnold’s lab, as evidenced by their current success in academia and industry, and they credit Arnold for providing a research environment where intellectual curiosity could run rampant.

“Arnold had an ability to inspire people and recruit great scientists,” Endelman said. “She created an environment where you felt empowered to pursue interesting questions.”

She was a candid advisor who did not sugarcoat her opinions, but the students who graduated from her ranks have thrived, almost like a microscale survival of the fittest atmosphere, which is appropriate considering her career devotion to evolution.

When asked why Arnold’s research program thrived, Buller, in part, attributed it to Arnold being “utterly te-

nacious and [wanting] that from her students”. Romero, on the other hand, attributed her success to being “laser focused”. Arnold realized early on that directed evolution was a superior way to engineer proteins and stuck with this approach.

The alumni also portrayed her as unhampered by setbacks, focused but amenable to intellectual curiosity, and a master communicator of science. She expected research excellence and that her students worked as tirelessly as she did, even in the midst of setbacks.

These traits manifested in the alumni, and they attribute their time in the Arnold lab for teaching them to do “good science,” to make their scientific presentations aesthetically appealing, and to tell the most effective story. As the alumni transitioned to their own independent careers, they continue to transmit the lessons learned in the lab of a laureate to their students and mentees throughout campus and the Madison area.

Buller once asked Arnold how she viewed academic competition, he remembers her saying, “I don’t worry about competition. I just do it better.” With her extensive list of accolades, now including a Nobel Prize, Arnold is clearly doing many things exceptionally well.

## Outreach:

## Institute for Chemical Education

By John Moore

*W. T. Lippincott Professor of Chemistry*

The Institute for Chemical Education (ICE) continues its extensive outreach program under the direction of John Moore and with the contributions of Andrew Greenberg, Linda Craft, Elizabeth Moore, Laura Linde and several undergraduate student workers. We gratefully acknowledge the American Chemical Society Wisconsin Section, which supports science activities on Earth Day and National Chemistry Week, the Boys & Girls Clubs of Dane County (B&GC), and the Millipore-Sigma Corporation, which provides scholarships for ChemCamps.

The major ICE activities are SCIENCECountErs, a national program headed by UW–Madison that collaborates with Boys & Girls clubs to reach underrepresented groups (<http://ice.chem.wisc.edu/outreach/sciencounters>); ChemCamps, whose unique program of hands-on science attracts middle-school children from as far away as either coast (<http://ice.chem.wisc.edu/camps>); distribution of science kits (<http://icestore.chem.wisc.edu/>); Research Experiences for Undergraduates programs (<http://ice.chem.wisc.edu/education/REU>); and support of SPICE (<http://ice.chem.wisc.edu/outreach/spice>), a student group doing science outreach. Photos from several programs are included and this year we concentrate our report to our many Badger Chemist friends on the REU program.

## Research Experience for Undergraduates

In 2017, ICE hosted four Research Experience for Undergraduates (REU) programs and continued to organize the research exchange program with the University of Science and Technology of China (USTC). Andrew Greenberg continued to serve as director of the Materials Research Science and Engineering Center-supported Research Experience for Undergraduates in Nanotechnology program, the Research Experience for Undergraduates in Chemistry and Chemical and Biological Engineering, and the Research Experience for Undergraduates in the Chemistry of Materials for Renewable Energy. Joining the ICE cohort for summer 2017 were



Location of SCIENCECountErs centers Nationwide

two students from Bob Hamers's Center for Sustainable Nanotechnology, two students from Gil Nathanson and Tim Bertram's Center for Aerosol Impacts on Climate and the Environment, and one student from John Berry's Center for Selective C-H Functionalization. The REU programs



Earth Day 2017



Earth Week 2018

participated in the Graduate School's Summer Research Opportunities Program, a consortium of 15 summer research programs on the UW–Madison campus with common goal of increasing diversity of the graduate student pool.

Together the programs attracted 48 students from the United States, including Puerto Rico, and China to spend 10 weeks working on individual research projects in labs on the UW–Madison campus, 23 of them in the chemistry department. Faculty included John Berry, Tim Bertram, Thomas Brunold, Fleming Crim, Sam Gellman, Ive Hermans, Padma Gopalan, Bob Hamers, Song Jin, Clark Landis, Gil Nathanson, Joel Pedersen, Shannon Stahl, and Tehshik Yoon.

Activities for the summer include a weekly lunch seminar series including talks by chemistry faculty, staff, and students: Randy Goldsmith, Padma Gopalan, Andrew Greenberg, Ive Hermans, Song Jin, Bob McMahon, John Moore, and Gil Nathanson. Additional activities included an improv night, and special seminar on applying and surviving in graduate school hosted by graduate students. The summer culminated with a department wide poster session where students presented the results from their summer research.

The REU programs are funded through summer 2019 from a generous grant from the National Science Foundation. If you know of students who would benefit from participating in REU, please encourage them to apply.

Images courtesy of Institute for Chemical Education



## Outreach:

# Fostering Community Appreciation of Science

By Bassam Z. Shakhashiri  
Professor of Chemistry and  
William T. Eyrue Distinguished Chair  
for the Wisconsin Idea

Today our biggest challenge is to help sustain Earth and its people in the face of population growth, finite resources, malnutrition, spreading disease, deadly violence, war, climate change, and the denial of basic human rights, especially the right to benefit from scientific and technological progress.

Science and society have what is essentially a social contract that enables great intellectual achievements but comes with mutual expectations of benefiting the human condition and protecting our planet. Our excellence in research and our commitment to high quality classroom teaching must be accompanied by sincere convictions to successfully connect with the public at large on all matters that relate to science and technology. Purposeful communication of the critical role of science and technology in society can help alter attitudes of the general public and can also foster collaboration among people across geographic boundaries to work together to solve global grand challenges.

I am now in my 49th year as a UW–Madison chemistry professor and continue to expand successful public engagement to reach audiences in person, on the radio, in print, and via television and social media. In the past two years, I and my group have given more than 80 scientific presentations in public venues ranging from schools to community centers to farmers markets to festivals to service organizations to professional society meetings. Many of these hands-on/minds-on interactive activities were bolstered by gifts from donors and in particular, a single donor whose gift made it possible to secure, equip, and help staff the SCIENCE IS FUN truck.

**“Public sentiment is everything. With public sentiment, nothing can fail; without it, nothing can succeed.”**

Abraham Lincoln

This is an integrated and comprehensive approach aimed at reaching audiences in cities and towns throughout Wisconsin and neighboring states. In keeping with the best traditions of the Wisconsin Idea, one major goal is to improve the connectivity between UW–Madison and the citizens of Wisconsin and neighboring states. Another



goal is to foster collaboration between various communities and UW–Madison to better serve mutual needs. Listening to youth and adults in schools and community settings and improving the quality of education in both urban and rural settings require deliberate and deep involvement by all stakeholders.

Providing opportunities to enhance the quality of learning and nurturing personal growth of students is crucial to fulfilling human potential. Professional development of teachers and inclusion of families in meaningful experiences greatly impact the creation of a sustainable environment for the betterment of science and society. We aim to contribute to defining and securing the meaning of the Wisconsin Idea for the 21st Century.



Images courtesy of Gerry Essenmacher

WI State Senator Kathleen Vinehout joins Bassam for a demonstration during a Science is Fun presentation in Alma, Wisconsin, September 14, 2018.

## Outreach:

# Young Scientists and Artists Compete to Send Crystals to Space

By Ilia A. Guzei

Director of Crystallography

From a Petri dish into space!

Do crystals grown in space differ from the ones grown on earth? Do compounds crystallize differently in space? What hardware does one use to conduct a crystallization experiment in space? Answers to these questions are sought by the winners of the WI state-wide Crystal Growing Contest (WICGC).

Last year's winners collaborated with the Molecular Structure Laboratory and scientists from the Center for the Advancement of Science in Space (CASIS) to design crystal-growing experiments, conducted aboard the International Space Station in March 2018. The 2018 winners will have the same opportunity in 2019. To qualify for this annual honor, three middle and three high school students won top prizes in the WICGC by growing high-quality crystals and creating crystal-inspired artworks.

WICGC has been organized since 2014 by the departmental Molecular Structure Laboratory to promote the Wisconsin Idea, introduce participants to the scientific method, and inspire the next generation of young scientists. Middle and high school students,



Winners of the 2018 Crystal Growing Competition received prizes and accolades at the awards ceremony in May.

home-schooled youths ages 11–18, and science teachers from Grantsburg to Green Bay to Racine to Benton, took part in the free contest. The competition offered an introduction to solution chemistry, laboratory work, team partnership, a prospect to succeed at a new endeavor, to fail and learn, and an opportunity to visit the UW–Madison campus and a flagship Chemistry Department.

At the May award ceremony, the chemistry department chair, Prof. Judith N. Burstyn, communicated the significant role of the department on campus; Prof. John Moore and Luke Oxtoby gave a lecture with chemical demonstrations; guest speaker from CASIS, Dr. Marc Giulianotti described the International Space Station and its function in the scientific community; Dr. Paula Piccoli (PPD) gave an

overview of the Contest and then Dr. Ilia Guzei awarded the prizes. All in attendance received gorgeous books on minerals donated by the UW–Madison Geology Department. The winners were recognized with certificates, books, T-shirts, and cash prizes.

Organization of the Contest is supported by numerous members of the chemistry department, whereas industrial and nonprofit sponsors provide financial support to this important outreach activity.

The WI Crystal Growing Contest takes place every year March–May. All details are at <http://wicgc.chem.wisc.edu>.

**READ MORE AND  
MEET THE WINNERS ONLINE AT  
[BADGERCHEMISTNEWS.CHEM.WISC.EDU](http://BADGERCHEMISTNEWS.CHEM.WISC.EDU)**



John Moore demonstrates diffraction at the 2017 WI State-Wide Crystal Growing Contest awards ceremony.



# ROBERT WEST

*international "Bobfests" & tributes*  
ON THE OCCASION OF HIS 90TH BIRTHDAY

By Anthony Millevolte & Matthias Driess

Colleagues and friends of Emeritus Professor Robert C. West joined to celebrate Bob's 90th birthday during special conference sessions in 2018.

It began in May with the 101st Canadian Chemistry Conference in Edmonton, Alberta, and continued in September at the Silicon Symposium in Prague and then at the 9th European Silicon Days in Saarbrücken (Germany). A special tribute to Bob, including a visual panorama of his life and icons,

was published in the Journal of Phosphorus, Sulfur, Silicon, and the Related Elements – the piece, and its associated artwork, can be accessed here:

[www.tandfonline.com/doi/full/10.1080/10426507.2018.1511558](http://www.tandfonline.com/doi/full/10.1080/10426507.2018.1511558)



Photos contributed by Matthias Driess

Robert West with colleagues in Prague. Pictured (from left): J. Michl, K. Baines, A. Sekiguchi, H. Schmidbaur, Y. Apeloig, R. Tacke, R. West, J. Kaleta, M. Driess, P. Young, M. Karni, K. Tamao, R. Weidner

# HYUK YU

*celebrates 85 years with busy travel schedule*  
TEACHING & CONSULTING IN KOREA AND CHINA

Having chosen right parents, with robust good health he celebrated his 85th birthday on January 20th. Thus, he has been taking on busy travel schedule to Korea and China for the past several years.

He goes to Korea semi-annually for industrial consulting for a couple of companies within the LG Corporation, and a petrochemical company; the consultancy with the LG has been continuous for the past 20 years.



Hyuk Yu

In addition, he has been to Shenzhen, China, to teach an equivalent of our CHEM 664 for 9 weeks, at the invitation of Prof. Charles C. Han (Ph.D.,



Hyuk with the staff of IAS, Shenzhen University, on an outing to a fortress of 1st Opium War, Nov 2017.

1973), Dean of Institute for Advanced Study (IAS), Shenzhen University. IAS is a special college within the university, set up as a center of excellence to serve as the bellwether of quality upgrading in teaching and research.

In January of 2017, he also went to



Shenzhen University's the central admin building, with a globe and pond in the foreground and science hall in the background.

Pohang University of Science of Technology in Korea to teach a short course on polymer physics for 3 weeks. It was at the invitation of Prof. Taihyun Chang (Ph.D., 1983), who just came off serving as the provost of the university.

Photos courtesy of Hyuk Yu

# BADGER CHEMISTS

COLLABORATION, RESEARCH,  
*stay busy with* INNOVATION, TRAVEL & MORE



NSF Center for Sustainable Nanotechnology meeting at the University of Illinois. (Fall 2017)

- **Michelle Buchanan** (Ph.D. 1978) was named Deputy for Science and Technology at the Department of Energy's Oak Ridge National Laboratory (ORNL) in October 2017. Buchanan is a fellow of the American Chemical Society and the American Association for the Advancement of Science.
- **Tess Carlson**, an undergraduate in the Cavagnero lab, was the first author of a cover article in the *Journal of Chemical Education* on the development of a new method for the naked-eye detection of protein folding and unfolding via the bright-blue fluorescence of a noncovalently-bound reporter dye.
- In June 2017, **Silvia Cavagnero** gave an invited lecture on the mechanism of protein folding in the cell at the Nobel Symposium on "Protein Folding from Molecular Mechanisms to Impact on Cells" (Sånga Säby, Sweden). The Symposium was part of a series of events organized by the Alfred Nobel Foundation ([https://www.nobelprize.org/nobel\\_organizations/nobelfoundation/symposia/complete-list.html](https://www.nobelprize.org/nobel_organizations/nobelfoundation/symposia/complete-list.html)).
- **Amanda Corcos**, who received her Ph.D. with the Berry Group and is now a postdoctoral fellow at Northwestern University, was recently named a Science and Technology Policy Fellow at AAAS. Her research centers around water purification and desalination.
- Professor **Mark Ediger** presented keynote lectures at international glass conferences in Poland and Denmark this year, as well as invited talks at two Gordon Research Conferences (Liquids and Dynamics at Surfaces) and the MRS, APS, and both fall and spring ACS meetings. He also presented three lectures at the Boulder Physics Summer School on Disordered Solids; you can find these online if you want a four-hour introduction to supercooled liquid and glasses! Mark was part of the team that successfully renewed UW-Madison's NSF-funded Materials Research Science and Engineering Center. The last year brought some industrial interest in the Ediger group glass work, with Mark making presentations at Corning and the IBM Almaden Research Lab. Mark also published a major review of the group's work on highly stable glasses in the *Journal of Chemical Physics*.
- **Randall Goldsmith's** work was featured in September 2018 by the Camille and Henry Dreyfus Foundation. The video *UW Madison: Making Molecular Movies with Single-Molecule Spectroscopy* (2018) is available on here: <https://youtu.be/keKIPMNBCiE>
- **Bob Hamers** participated in two briefings on Capitol Hill in Oc-

tober: one to staffers, federal program managers, and others at the US House of Representatives and a second for similar groups at the US Senate. Eight faculty entrepreneurs presented. The briefings were organized by the Science Coalition, a non-profit sponsored by UW and other major research universities, to encourage federal support of basic research to stimulate the economy. They were sponsored by US Rep. Bill Foster and US Sen. Jerry Moran and US Sen. Christopher Coons, co-chairs of the Senate Competitiveness Caucus, who also presented. Hamers is co-founder, with emeritus professor Bob West, and chief science officer of Silatronix, Inc., which commercializes advanced electrolytes for lithium-ion batteries. Silatronix was founded in 2007 and employs approximately 20 people in the US and in Japan.



Bob Hamers explains to US Representative Bill Foster how basic research at UW lead to the founding and growth of Silatronix



- **Hamers** continues as director of the NSF Center for Sustainable Nanotechnology (CSN), which involves 15 faculty at 12 universities and at the Pacific Northwest National Lab. CSN supports the research of approximately 45 Ph.D. students. CSN researchers investigate the fundamental chemical mechanisms associated with nanomaterial-biological interactions of relevance to understanding and predicting the potential environmental impact of nanomaterials. Much of the center's effort has focused on complex metal oxides used in energy storage (e.g., lithium ion batteries). A new effort this year has been the intentional use of nanomaterials for sustainable agriculture. In initial studies, grad student Jaya Borgatta (Hamers) led an effort demonstrating that application of a dispersion of CuO nanoparticles suppressed disease and enhanced growth of watermelon plants. Current disease suppression typically involves use of CuSO<sub>4</sub> solutions, but much of the Cu is washed deep into the soil and is not effective. Jaya showed that applying CuO nanoparticles instead of CuSO<sub>4</sub> solution can lead to similar disease suppression using much less total copper, thereby improving the efficiency of material application and reducing the total amount of Cu that must be applied.
- **The Hamers group** continues as one of the world's leading groups investigating the applications of diamond in chemistry. Much of this work utilizes the extraordinary chemical stability of diamond and uses it as a catalytic or photocatalytic reactions. Of particular interest has been the use of diamond as a way to directly emit electrons into water, producing solvated electrons. The resulting solvated electrons induce novel chemistry such as the reduction of nitrogen to ammonia and the reduction of CO<sub>2</sub> to CO. This year grad student Shuo Li led an effort demonstrating how to alter the color of diamond films and further enhance the electron



Izzy Foreman-Ortiz, Bob Hamers and Brandon Taitt attended the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCHE) conference to share information on the UW-Madison Department of Chemistry's graduate program.

emission properties by incorporating silver nanoparticles into the diamond matrix. That work led to a submitted patent application and a just-published paper. Bob Hamers gave an invited talk on this work at the International Conference on Diamond and Carbon Materials in Dubrovnik, Croatia in September 2018.

- Cavagnero group alumnus **Bryan Mounce** has become an Assistant Professor at the Medical School of Loyola University (Department of Microbiology and Immunology), Chicago, IL.
- **Silatronix**, the start-up company Bob Hamers and Bob West co-founded, has had several major breakthroughs in the last year, in understanding the unique chemistry of Silatronix's first commercial product, an organosilicon compound known as OS3. The addition of OS3 to the industry-standard lithium-ion battery electrolytes significantly improves the electrochemical and thermal stability of the electrolyte and leads to remarkable improvements in the perfor-



Senior scientist Michael Shortreed challenged his students to connect with and meet professors at a US HUPO proteomics meeting. As proof of their accomplishment, they captured this wonderful selfie. It includes a real "who's who" in proteomics. Across the front (Zach Rolfs, Anthony Cesnik, Leah Schaffer and Rachel Miller). Pls across the back Ben Garcia (UPenn), Ileana Cristea (Princeton), Olga Vitek (Northeastern), Alexey Nesvikhii (UMich) and Hanno Steen (Boston Children's Hospital).

mance of complete lithium ion batteries, allowing operation at higher temperature and higher voltage – both critical to applications such as electric vehicle technologies. At UW, Ph.D. student Sarah Guillot

used the Hamers group's analytical tools and the department's NMR facilities to understand the detailed chemical breakdown pathways of OS3, to understand the mechanisms underlying these remarkable improvements. Sarah demonstrated how OS3 interrupts an autocatalytic decomposition process that typically leads to battery failure, and showed that, by interrupting that pathway, OS3 improves stability of the battery electrolyte.

- **Nick Hill and Brian Esselman** organized and hosted a one-day conference in March for faculty of UW-system two-year colleges; the conference focused on innovative teaching and assessment in the undergrad organic chemistry laboratory.
- 2018 was an important year for **John and Carol Wright**. They were married on August 17, 1968 and celebrated their 50th anniversary this year on that date, with a special celebration at the North House restaurant in Avon, Connecticut, where they had their wedding rehearsal dinner. Half of the original 100 wedding attendees joined in an evening of dancing, eating, and celebrating, highlighted by David and Liva Wright demonstrating why they won the Blackpool Ballroom Dance competition in 2014. John and Carol also visited Seoul, Korea for the International Conference on Coherent Multidimensional Spectroscopy, where John received the conference's Lifetime Achievement Award. John's ninth student,



Sunil Mho with John and Carol Wright



Image courtesy of Sarah Guillot

On August 31st about 30 members of the chemistry department ran in the 3rd annual "Degree Dash" put on by the UW-Madison Graduate School. The runners completed either 5.81 miles in the Doctoral Derby or 1.82 miles in the Master's Mile (distances determined by average time to degree at UW-Madison) to earn their Degree Dash Diplomas!

Sunil Mho, and her husband then took them on an extended tour of Korea. Sunil is getting ready to retire next year after a distinguished career at Ajou University, where she was recognized as one of the top woman scientists in Korea.

- **The Wright group** reached a milestone this year by demonstrating the creation of a quantum mechanical Schrodinger Cat state consisting of two vibrational and one electronic state in cobalamin (vitamin B12). The cat state occurs when the molecule is simultaneously present in all three states. It emits bright light beams during the time of its brief existence. It is formed by simultaneously exciting the three states with separate light pulses that are shorter than the time for the molecular wave functions to forget their quantum mechanical phase. Cat state spectroscopy has the capability to resolve individual states within congested vibrational and electronic spectra and has the potential for wide-spread use in fields where spectroscopy is an important tool.
- **Prof. Martin Zanni** is on sabbatical

in Lausanne, Switzerland during the 2017-2018 academic year, studying in the research group of Prof. Anders Hagfeldt at EPFL. Prof. Hagfeldt is a world leader in new types of solar cells and the material science that goes along with them. Graduate student Jessica Flach, from the Zanni group, is also spending the year in Lausanne. After just two months of training, she can now routinely make 19% efficient perovskite solar cells. There are only a dozen research groups in the world that can achieve that high of an efficiency. The UW sabbatical program is a terrific mechanism for faculty to learn new science and bring cutting-edge topics back to Madison, which is what Zanni and Flach will do next summer when they return. Sabbaticals are also a lot of work because the obligations at Madison do not stop – papers need to be written, research and grants renewed. But it is interesting and fun to live abroad, learning how science is practiced differently



(lots of coffee involved) and how the Suisse live differently (very quietly). And, it is exciting that next summer, Jessi will teach the rest of the group her new skills and Zanni will write proposals to fund this new line of research at Madison.

- Graduate student in the Hermans group, **Sara Specht**, placed first in the 2017 3-Minute Thesis competition, put on by Graduate Women in Science. The purpose was to communicate the general ideas of one's PhD research to a general STEM audience. Three other chemistry students competed: Alyssa Love (Hermans group), Camille Bishop (Ediger group), and Morgan Rea (Goldsmith group).
- The UW–Madison **Theoretical Chemistry Institute (TCI)** awarded the 2018-19 Joseph O. Hirschfelder Prize in Theoretical Chemistry to Professor Peter Rossky, dean of the Wiess School of Natural Sciences at Rice University. He is also the Harry C. and Olga K. Wiess Professor of Chemistry and professor of chemical and biomolecular engineering. Rossky is a member of the National Academy of Sciences, a member of the American Academy of Arts and Sciences, a fellow of the American Association for the Advancement of Science and a Fellow of the American Physical Society. Prof. Rossky is a theoretical chemist who finds nothing more engaging than to try to understand the molecular-level processes that underlie an important experimental observation whose origin is controversial or puzzling. His work lies almost entirely within amorphous condensed phase materials (liquids,

polymers, molecular clusters). TCI established the Joseph O. Hirschfelder Prize in Theoretical Chemistry in 1991 in response to a generous bequest from Professor Joseph O. Hirschfelder (1911-90) and his widow, Dr. Elizabeth S. Hirschfelder. Over the course of his 40-year career, Professor Hirschfelder established himself as

a leader in teaching, research, and public service at the university and in the broader research community. The award commemorates his role as a pioneering member of the theoretical chemistry field, beginning in the late 1930s. Prof. Rossky visited the UW–Madison Department of Chemistry in October to deliver public lectures.

## Another successful GSFLC Snout-Out



*By Rebeca L. Fernandez  
Graduate Student, Brunold Group*

The Graduate Student-Faculty Liaison Committee (GSFLC) celebrated its 35th annual Snout-Out departmental picnic and softball tournament on September 25, 2018. Named after the original tradition of cooking a pig underground, the Snout-Out brought together 15 faculty members, 150 graduate students and nine postdocs, as well as numerous friends and family. Xiao Dong, a third year in the Yoon Group and new member of the GSFLC, championed the grill, a thankless task on this sunny day with no cloud in sight.

The softball tournament began with the Materials vs. Physical paths facing off. Materials advanced to play the Inorganic/ChemBio team, who won the second game, then played the Organic team. The final two games put Inorganic/ChemBio in first place, Materials in second, Physical in third, and Organic in fourth place. The Inorganic/ChemBio team will have one year of bragging rights and a poster of this winning team will be displayed in the Department of Chemistry's Shain tower.

# Awards & Honors

## FACULTY & STAFF

- **Prof. John F. Berry** — AAAS fellow; 2017 Romnes Faculty Fellowship
- **Prof. Helen E. Blackwell** — GSFLC Mentor Award
- **Michael Bradley** — 2018 L&S University Staff Award
- **Prof. Thomas Brunold** — Chancellor's Distinguished Teaching Award
- **Prof. Andrew Buller's lab** — Morgridge Metabolism Fellowship
- **Prof. Silvia Cavagnero** — 2017 Award for Mentoring Undergraduates in Research, Scholarly & Creative Activities from the Office of the Provost; University Housing Honored Instructor Award
- **Prof. Joshua Coon** — Discovery in Proteomic Sciences Award from the Human Proteome Organization, Sponsored by the Journal of Proteomics
- **Emeritus Prof. Fleming Crim** — Appointed NSF Chief Operating Officer
- **Tracy Drier** — 2017 Local Section Outreach Volunteer of the Year Award from the Wisconsin Section of ACS
- **Dr. Brian Esselman** — 2017 Harvey Spangler Award for Technology Enhanced Instruction from the College of Engineering; 2017 Taylor Excellence in Teaching Award
- **Prof. Etienne Garand** — 2018 Journal of Physical Chemistry and ACS Physical Chemistry Division Lectureship Award
- **Prof. Ying Ge** — Romnes Faculty Fellowship
- **Prof. Randy Goldsmith** — 2017 Journal of Physical Chemistry C' Lectureship Award; 2017 Camille Dreyfus Teacher-Scholar Award; James W. Taylor Teaching Award
- **Prof. Ive Hermans** — Romnes Faculty Fellowship; Ipatieff Prize; 2017 Vilas Mid-Career Investigator Award
- **Matt Haveman** — Michael Kellogg Outstanding Chemistry TA Award
- **Lida Khalafi** — Michael Kellogg Outstanding Chemistry TA Award
- **Dr. Nick Hill** — Academic Staff Mid-Career Award (L&S); 2017 Taylor Excellence in Teaching Award
- **Prof. Clark Landis** — Selected to Present the 2017 Paolo Chini Memorial Lecture at the National Meeting of the Italian Chemical Society (SCI)
- **Manos Mavrakakis** — Gabor A. Somorjai Award for Outstanding Research in the Advancement of Catalysis
- **James Maynard** — Academic Staff Excellence Award in Recognition of Leadership, Public Service, Research, Teaching and Overall Excellence; 2018 Chancellor's Award for Excellence in Service to the University
- **Paul McGuire** — Departmental Academic Staff Excellence Award
- **Robert McMahon** — Arthur C. Cope Scholar Award
- **Catherine Middlecamp** — George C. Pimentel Award; 2017 Emil Steiger Teaching Award
- **Steven Myers** — 2018 L&S University Staff Award
- **Emeritus Prof. Dan Rich** — 2017 Meienhofer Award from the Boulder Peptide Society
- **Prof. Jennifer Schomaker** — 2018 Vilas Faculty Mid-Career Investigator Award; UW2020 Award; Co-Principal Investigator on *All-Optical Electrophysiology-Electrophysiology without Electrodes*; Named to Editorial Board of Organic Reactions; Became Chair of the Organizing Committee for the 2019 U.S. Kavli Frontiers in Science Symposium
- **Prof. JR Schmidt** — 2017 Chancellor's Distinguished Teaching Award
- **Prof. Bassam Shkhashiri** — 2018 Grady-Stack Award for Interpreting Chemistry for the Public
- **Dr. Michael Shortreed** — 2018 Chancellor's Award for Excellence in Research
- **Prof. Edwin L. Sibert** — Named 2017 Theoretical Chemistry Institute Director; Named ACS fellow
- **Prof. Shannon Stahl** — Steenbock Professorship in Chemical Sciences; Elected to a Four-Year Term on the Graduate Faculty Executive Committee, Which Oversees Graduate Education for the University
- **Prof. Jim Weisshaar** — Appointed to a WARF Professorship - Richard J. Burke Professor of Chemistry



Department of Chemistry chair Judith Burstyn presents professor Shannon Stahl with a plaque for receiving the prestigious Steenbock Professorship.

- **Prof. Tehshik P. Yoon** — 2018 Organic Letters Outstanding Publication of the Year Award Lectureship, Sponsored by Organic Letters and the ACS Division of Organic Chemistry; Arthur C. Cope Scholar Award from the ACS; Vilas Faculty Mid-Career Investigator Award; James W. Taylor Teaching Award
- **Prof. Marty Zanni** — 2017 Craver Award International Prize from the Coblentz Society

## GRADUATE STUDENTS

- |                                    |  |
|------------------------------------|--|
| <b>Ariel Alperstein</b> (Zanni)    | Roger J. Carlson Graduate Award  |
| <b>Michael Aristov</b> (Berry)     | 2018 NSF Graduate Research Fellowship  |
| <b>Arya Baghkhani</b>              | Michael Kellogg Outstanding Chemistry TA Award   |
| <b>Naomi Biok</b> (Gellman)        | 2017 WARF Discovery Challenge Prize, Michael Kellogg Outstanding Chemistry TA Award  |
| <b>Stephanie Blaszczyk</b> (Tang)  | 2018 NSF Graduate Research Fellowship  |
| <b>Anna Brezny</b> (Landis)        | WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll  |
| <b>Amanda Buchberger</b> (Li)      | WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll  |
| <b>Qinjingwen Cao</b> (Li)         | Michael Kellogg Outstanding Chemistry TA Award   |
| <b>Allison C. Cardiel</b> (Choi)   | Peer Award   |
| <b>Anthony Cesnik</b> (Smith)      | WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll  |
| <b>Steven Chapman</b> (Yoon)       | Gary Parr Memorial Award   |
| <b>Bingming Chen</b> (Li)          | Michael Kellogg Outstanding Chemistry TA Award   |
| <b>Josh Corbin</b> (Schomaker)     | WISL Communicating Ph.D. Research to Non-Scientists 2017 Honor Roll  |
| <b>Matthew Dalphin</b> (Cavagnero) | Goering Organic Chemistry Fellowship   |
|                                    | PPG Industries Mentoring Award, Stephen D. Morton Mentorship Award - Mentor, Educational Committee Travel Award to 2018 Biophysical Society Meeting in San Francisco |





Silvia Cavagnero, K. V. Reddy, Sonisilpa Mohapatra, Judith Burstyn and James C. Weisshaar, attended the 2018 Student Awards Ceremony.

<b>Lianna Dang</b> (Jin)	Michael W. McCoy Memorial Scholarship
<b>Kellen DeLaney</b> (Li)	NIH NRSA F31 Predoctoral Fellowship
<b>Matthew R. Dent</b> (Burstyn)	GSFLC Mentor Award
	Casey Excellence in Research Award (Inorganic)
<b>Stephanie Dillon</b> (Brunold)	Michael Kellogg Outstanding Chemistry TA Award
<b>Matt Dorris</b> (Bolling)	Michael Kellogg Outstanding Chemistry TA Award
<b>Geoffrey Eddinger</b> (Gellman)	Robert C. Doban Mentorship Award
<b>Moira Esson</b> (Mecozzi)	Michael Kellogg Outstanding Chemistry TA Award
<b>Alex Foote</b> (Goldsmith)	Michael Kellogg Outstanding Chemistry TA Award
<b>Nels Gerstner</b> (Schomaker)	PPG Industries Mentoring Award
	Casey Excellence in Research Award (Organic)
<b>Shannon Goes</b> (Stahl)	2017 NSF Graduate Research Fellowship
<b>Brian Graham</b> (Raines)	Michael Kellogg Outstanding Chemistry TA Award
<b>Christopher Gravatt</b> (Yoon)	2017 NSF Graduate Research Fellowship
<b>Jiehao Guan</b>	Michael Kellogg Outstanding Chemistry TA Award
<b>Ling Hao</b> (Li)	WISL Communicating Ph.D. Research to Non-Scientists 2017 Honor Roll
<b>Erik Horak</b> (Goldsmith)	Hartl Excellence in Research Award (Physical)
<b>Minxue Huang</b> (Schomaker)	2017 Eastman Summer Research Award
<b>Tesia Janicki</b> (Schmidt)	2018 NSF Graduate Research Fellowship
<b>Michael R. Johnson</b>	Michael Kellogg Outstanding Chemistry TA Award
<b>Bradley Jones</b> (Landis)	WISL Communicating Ph.D. Research to Non-Scientists 2017 Honor Roll
<b>Minsoo Ju</b> (Schomaker)	Goering Organic Chemistry Fellowship, Attended Division of Organic Chemistry Graduate Research Symposium
<b>Jesse Kidd</b> (Yoon)	2017 NSF Graduate Research Fellowship
<b>Samantha Knott</b> (Ge)	2017 NSF Graduate Research Fellowship
<b>Samuel M. Kougias</b> (McMahon)	Michael Kellogg Outstanding Chemistry TA Award
<b>Caitlin Kozack</b> (Stahl)	Robert C. Doban Mentorship Award
<b>Stephen Kubota</b> (Choi)	WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll, Cool Science Image Contest winner
<b>Elizabeth Laudadio</b> (Hamers)	2017 NSF Graduate Research Fellowship
<b>Shuo Li</b> (Hamers)	PPG Corporation Summer Fellowship
<b>Shane Lies</b> (Yoon)	Michael Kellogg Outstanding Chemistry TA Award

## COOL SCIENCE IMAGE CONTEST

*winners from chemistry*



Kubota



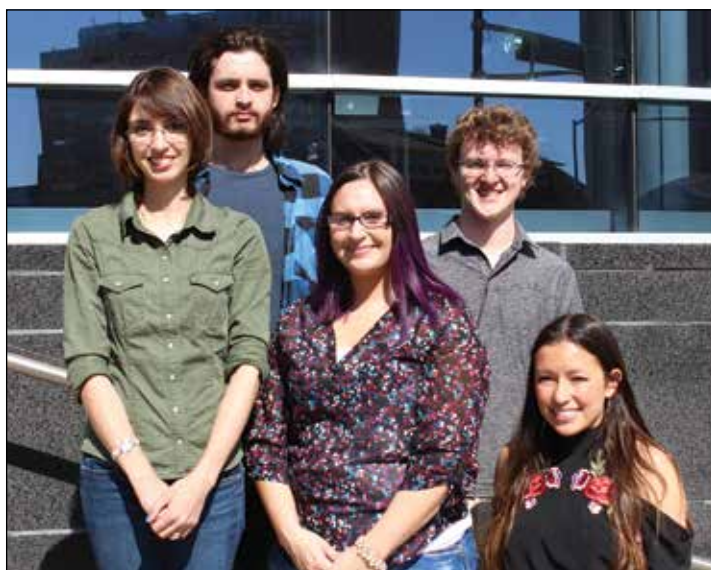
Shearer

<b>Shi Liu</b> (Gellman)	Hirschmann-Rich Fellowship (Bio-organic), Casey Excellence in Research Award (Chem Bio)
<b>Alyssa M. Love</b> (Hermans)	Morton Research Award - Graduate Mentor, GSFLC Mentor Award
<b>Lydia H. Manger</b> (Goldsmith)	Michael Kellogg Outstanding Chemistry TA Award
	WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll
<b>Andrew M. Maza</b> (Landis)	Michael Kellogg Outstanding Chemistry TA Award
<b>William McDermott</b> (Hermans)	2017 NSF Graduate Research Fellowship Honorable Mention
<b>Sonisilpa Mohapatra</b> (Weisshaar)	K.V. & Sara Reddy Award (Physical Chemistry), WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll
<b>Darien Morrow</b> (Wright)	Roger J. Carlson Graduate Award, 2017 NSF Graduate Research Fellowship Honorable Mention
<b>Marshall Padilla</b> (Mecozzi)	Michael Kellogg Outstanding Chemistry TA Award
<b>Paige Pizsel</b> (Stahl)	2017 NSF Graduate Research Fellowship
<b>Yue Qiu</b> (Ediger)	Hartl Excellence in Research Award (Materials), GSFLC Poster Award, Midwest Organic Solid State Conference Student Presentation Award

<b>Leslie Rank</b> (Gellman)	Baxter's Young Investigator Award
<b>Morgan Rea</b> (Goldsmith)	3M Fellowship (2017-2020), 2017 NSF Graduate Research Fellowship
<b>Joshua Ricci</b> (Ediger)	John and Beverly Schrag Analytical Chemistry Outstanding Peer Award
<b>Nicholas Riley</b> (Coon)	Hartl Excellence in Research Award (Analytical)
<b>Cara Schwarz</b> (McMahon)	Michael Kellogg Outstanding Chemistry TA Award
<b>Melinda Shearer</b> (Hamers/Jin)	John and Beverly Schrag Analytical Chemistry Outstanding Peer Award, 2018 Leah Cohodas Berk Award, WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll, Cool Science Image Contest winner
<b>Evan Sherbrook</b> (Yoon)	Goering Organic Chemistry Fellowship
<b>Kazimer Lennon Skubi</b> (Yoon)	WISL Communicating Ph.D. Research to Non-Scientists 2017 Honor Roll
<b>Sarah Specht</b> (Hermans)	Robert C. Doban Mentorship Award
<b>Matthew Stolt</b> (Jin)	John and Beverly Schrag Analytical Chemistry Outstanding Peer Award
<b>Matthew Styles</b> (Blackwell)	2017 NSF Graduate Research Fellowship
<b>Blaise Thompson</b> (Wright)	Michael Kellogg Outstanding Chemistry TA Award
<b>Aristidis Vasilopoulos</b> (Stahl)	Goering Organic Chemistry Fellowship, Sam C. Slifkin Award in Chemistry
<b>Emily Wilkerson</b> (Coon)	WISL Communicating Ph.D. Research to Non-Scientists 2017 Honor Roll
<b>Zhilin Yang</b> (Weisshaar)	WISL Communicating Ph.D. Research to Non-Scientists 2018 Honor Roll
<b>Vincent Yannello</b> (Fredrickson)	Michael Kellogg Outstanding Chemistry TA Award
<b>Mehmet Yilmaz</b>	Michael Kellogg Outstanding Chemistry TA Award
<b>Maria Zdanovskaia</b>	Michael Kellogg Outstanding Chemistry TA Award
<b>Yongqian Kelly Zhang</b> (Hamers)	Paul J. Bender Memorial Award
<b>Yuzhou Zhao</b> (Jin)	Michael Kellogg Outstanding Chemistry TA Award
<b>Katie Ziebarth</b> (Landis)	Michael Kellogg Outstanding Chemistry TA Award, Paul Bender Memorial Award, 2018 Leah Cahodas Berk Award

## UNDERGRADUATE STUDENTS

<b>Dhruva Ajit Nair</b>	Department of Chemistry Chair's Scholarship
<b>Joshua Ber</b>	Undergrad Support in Chemistry Scholarship
<b>Karishma Bhawnani</b>	Eugene & Patricia Kreger Herscher Scholarship
<b>Michael Bieser</b>	Undergrad Support in Chemistry Scholarship
<b>Sylvia Bohling</b>	George J. and Arleen D. Ziarnik Scholarship
<b>Jacob Buboltz</b>	George J. and Arleen D. Ziarnik Scholarship
<b>Tess Carlson</b> (Cavagnero)	Undergraduate Poster Award, UW-Madison Sophomore Research Fellowship, Hilldale-Holstrom Research Fellowship, Andrew Dorsey Memorial Scholarship
<b>Kalli Choles</b>	ACS-Hach Land Grant Undergrad Scholarship
<b>Chase Cunniff</b>	Francis Craig Krauskopf Memorial Award
<b>Sarah Doughty</b>	Undergrad Support in Chemistry Scholarship, Stephen Morton Research Award - Mentee
<b>Sarah Dyke</b>	Undergrad Support in Chemistry Scholarship
<b>Stephan Early</b> (Blackwell)	Alpha Chi Sigma Alumni Endowed Scholarship Hilldale-Holstrom Research Fellowship Hodge Scholarship, Hilldale-Holstrom Research Fellowship, 2017 Undergraduate Poster Honorable Mention



Department of Chemistry winners of the 2018 Graduate Research Fellowship from the National Science Foundation (NSF) include, from left: Tesia Janicki; Michael Aristov, Stephanie Blaszczyk, Lucas Oxtoby, and Gabriela Negrete-Garcia.

<b>Benjamin Eliason</b> (Schomaker)	Hodge Scholarship
<b>Claire Evensen</b>	Ackerman Scholarship Martha Gunhild Week Scholarship
<b>Ben Feingold</b> (Zanni)	Excellence in Analytical Chemistry (local ACS)
<b>Jaclyn Felicijan</b>	Moore Award for Excellence in Chemistry 108
<b>Yiting (Cloris) Feng</b>	Francis Craig Krauskopf Memorial Award
<b>Collin Goebel</b>	Noland Chemistry Research Scholarship
<b>Weiyang Guan</b> (Schomaker)	Firminhac Chemistry Scholarship, Summer Research Support scholarship
<b>Zachary Heim</b>	ACS Undergraduate Award (Physical Chemistry) Undergraduate Poster winner with Mentors: Amberger/Esselman/Woods/McMahon
<b>Mengzhou Hu</b>	2017 Undergraduate Poster winner with Mentors: Kellen/DeLaney/Li
<b>Richard Jodts</b>	ACS Undergrad Award (Inorganic Chemistry)
<b>Kadina Johnston</b>	Hilldale-Holstrom Research Fellowship, Excellence in Physical Chemistry (local ACS)
<b>Rezwana Karim</b>	Undergraduate Poster winner with Mentors: Cheng/Record
<b>Hawa Keita</b>	Undergraduate Poster winner with Mentors: Daub/Yoon
<b>Yeon Jung Kim</b>	Department of Chemistry Chair's Scholarship, Margaret McLean Bender Scholarship
<b>Xiaoxuan Lin</b>	Excellence in Organic Chemistry (local ACS)
<b>Emily Loehr</b>	Eugene & Patricia Kreger Herscher Scholarship
<b>Ryan Lopez</b>	Francis Craig Krauskopf Memorial Award
<b>Jack McCann</b>	Richard Fischer Scholarship Hilldale-Holstrom Research Fellowship
<b>Douglas Miller</b>	Excellence in Physical Chemistry (local ACS)
<b>Mackenzie Miller</b>	Michael Kellogg Outstanding Chemistry TA Award, ACS-Hach Land Grant Undergrad Scholarship
<b>Gabriela Negrete-Garcia</b>	2018 Graduate Research Fellowship from NSF
<b>Chi-Min Ni</b>	Moore Award for Excellence in Advanced General Chemistry 109
<b>Fatima Nizamuddin</b>	Eugene & Patricia Kreger Herscher Scholarship
<b>Samuel Nortman</b>	Francis Craig Krauskopf Memorial Award
<b>Charlotte O'Sullivan</b>	Eugene & Patricia Kreger Herscher Scholarship



## CELEBRATING SUCCESS

*John & Beverly Schrag Award*

The John & Beverly Schrag Fund supported dinner at the Overture Center to celebrate the Materials Outstanding Peer Award winners Matthew Stolt and Joshua Ricci. Dr. Jeffrey Hirsch, a UW graduate who works for ThermoFisher, was the guest speaker.

Left: Emeritus Professor James Taylor, Professor John Wright, Dain Brademan, Professor Joshua Coon, Beverly Schrag and Vanessa Linke

Right: Matthew Stolt with Beverly Schrag

**Sylvia Speidel**  
**Alex Staikos** (Cavagnero)

**Christopher Stubbs**  
**Isabelle Tigges-Green** (Zanni)

**Ruiting Tong**

**Justin Twardowski**  
**Pajeau Uchupalanun** (Hermans)  
**Luke Carmichael Valmadrid**  
**Laura Vergenz**

**Ana Viteri**

**Jessica Wang**

**Riley Whitehead** (Hamers)

**Andrew Wittman** (Cavagnero)

**Mengcheng Wu** (Goldsmith)

**Susanna Yaeger-Weiss** (Cavagnero)

**Sumin Yang**

**Ethan Young**

**Zhi Yuan**

Edwin M. and Kathryn M. Larsen Scholarship  
Karen M. Telander Undergrad Research Award  
Plank and Putze Memorial Scholarship  
Stephen D. Morton Mentorship Award - Mentee  
Department of Chemistry Chair's Scholarship  
Ackerman Scholarship  
Don Brouse Memorial Scholarship  
Hilldale-Holstrom Research Fellowship  
Firminac Chemistry Scholarship  
John & Elizabeth Moore Award for Excellence  
in Advanced General Chemistry 109.  
Excellence in Inorganic Chemistry (local ACS)  
Stephen Morton Research Award - Mentee  
George J. and Arleen D. Ziarnik Scholarship  
Francis Craig Krauskopf Memorial Award  
Saco Polymers Scholarship  
Francis Craig Krauskopf Memorial Award  
Eugene & Patricia Kreger Herscher Scholarship  
UW-Madison Hilldale Research Award  
Walter W. and Young-Ja C. Toy Scholarship  
Martha Gunhild Week Research Scholarship  
UW-Madison Hilldale Research Award  
Eugene & Patricia Kreger Herscher Scholarship  
Undergraduate Poster Honorable Mention  
Mentors: Specht/McDermott/Hermans  
Excellence in Analytical Chemistry (local ACS)

## ALUMNI &amp; FRIENDS

- **Robert Bergman** (Ph.D. 1966, Berson) was named a Wisconsin Alumni Association Distinguished Alumni in 2017. Bergman is a Gerald E.K. Branch Distinguished Professor Emeritus of Chemistry at the UC-Berkeley, faculty senior scientist with Lawrence Berkeley National Laboratory, and 2017 winner of the Wolf Prize in Chemistry.
- Whitehead Career Development Associate Professor **Matthew D. Shoulters** has been named one of 13 young faculty nationwide to be honored with a 2018 Camille Dreyfus Teacher-Scholar Award by the Camille and Henry Dreyfus Foundation.
- **Tianning Diao**, Assistant Professor of Chemistry at New York University and UW-Madison Department of Chemistry alumna, is the 2018 recipient of the Organometallics Distinguished Author Award.
- **Chris Ciolli** (Ph.D. 2004, Organic Chemistry, Belshaw) was granted three US patents for development of lubricant additive components as a research chemist, and was promoted to Technical Services Manager in Blend Test Services for The Lubrizol Corporation in Wickliffe, Ohio, a specialty chemical company delivering valuable solutions to customers and their end-users in the global transportation, industrial, and consumer markets.
- **Joann "Jo" Eisenhart**, (Ph.D. 1985) was promoted to executive vice president of Northwestern Mutual, and oversees human resources, campus & event experiences, digital workplace corporate solutions, communications and strategic philanthropy & community relations.
- **Yan Wang** (Ph.D. 1993 Chemistry, MBA 1991) was named CEO of Cytovance Biologics and president of Scientific Protein Laboratories.

**Lucas Oxtoby** (Schomaker)

**Justin Paddock**

**Ziyi Pan**

**Alexander Passow**

**Caitlin Pavelec** (Smith)

**Timothy Pinkerton**

**Helena Pliszka**

**Sarah Quinn**

**Sam Rider**

**Ryan Robitaille** (Schomaker)

**Abby Rothering**

**Soren Rozema**

**Hazel Schira**

**Wenqi Shen** (Blackwell)

**Aditya Singh** (Yethiraj)

**Yoo Jin Song** (Cavagnero)

**Jimmy Soeherman**

**Jennifer Sowin**

Ieva Reich Undergraduate Scholarship  
Undergraduate Support in Chem Scholarship  
ACS Undergrad Award in Organic Chemistry  
Named a Barry Goldwater Scholar  
2018 Graduate Research Fellowship from NSF  
2017 Undergraduate Poster winner  
with mentors Liu/Gerstner /Schomaker  
Moore Award for Excellence in  
Advanced General Chemistry 109  
2018 ACS Undergrad Award (Physical Chem)  
Department of Chemistry Chair's Scholarship  
Eugene & Patricia Kreger Herscher Scholarship  
Undergraduate Support in Chem Scholarship  
Department of Chemistry Chair's Scholarship,  
Mabel Duthey Reiner Scholarship  
Undergraduate Support in Chem Scholarship  
2017 Undergraduate Poster winner  
Mentors: Yang/Weisshaar  
Department of Chemistry Scholarship  
Excellence in Organic Chemistry (local ACS)  
2018 Goldwater Honorable Mention  
Ackerman Scholarship  
Wayland E. Noland Research Fellowship  
Edward J. Panek Memorial Scholarship  
Michael Kellogg Outstanding  
Chemistry TA Award  
Ackerman Scholarship  
Department of Chemistry Chair's Scholarship  
Edwin M. and Kathryn M. Larsen Scholarship  
Robert Franklin Taylor Scholarship  
Undergraduate Poster Award  
Mentors: Cavagnero/Dalphin  
Excellence in Physical Chemistry (local ACS)  
Ackerman Scholarship  
Ieva L. Reich Undergraduate Scholarship  
Undergraduate Poster Award  
Mentors: Kozack/Stahl

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# A Farewell to Former UW–Madison Chancellor & Department of Chemistry Chair

## Irving Shain

By Eric Hamilton  
 UW Communications  
 First published 3/7/18

Irving Shain, a chemistry professor, former department chair and UW–Madison chancellor emeritus who advanced the university's interests in China and established University Research Park, died peacefully Tuesday, March 6, 2018 in Madison after a brief illness. He was 92.

Shain joined the UW–Madison faculty in 1952, later chairing the Department of Chemistry from 1967 until his appointment as vice chancellor for academic affairs in 1970, serving until 1975. He was chancellor for almost a decade, from 1977 to 1986. After stepping down as chancellor, he joined the Olin Corporation as vice president and chief scientist, a post he held until 1992.

During his tenure as chancellor, Shain oversaw the establishment of the School of Veterinary Medicine and the development of the health sciences complex on the west end of campus. He was instrumental in establishing University Research Park, the 260-acre business incubator located on Madison's west side.

"I am deeply grateful to have had the opportunity to work with Irv on the Board of Trustees of University Research Park," says UW–Madison Chancellor Rebecca Blank. "Irv was always smart and strategic, while also having a wry sense of humor. His impact on this university is visible more than 30 years after he left. Irv Shain made UW better in many ways throughout his career on this campus. We will miss him and remember him."

In 2006, Shain's contributions to the Department of Chemistry and UW–Madison were honored at the dedication of the then-new Shain Research Tower of the Chemistry Building, at which Gov. Jim Doyle and former Chancellor John Wiley spoke. In 2016 his sons, John and Paul, endowed the Irving Shain Chair in Chemistry, which supports the research programs of the department chair in recognition of their father's contributions in that position.

"He was a mentor to me and so many other faculty and administrators," says Bassam Shakhashiri, a professor of chemistry at UW–Madison who was hired by Shain in 1970 and who became close friends with him. "His influence transcends the chemistry department and UW–Madison."

Shain steered development of University Research Park through its early years, which were fraught with slow growth and intense criticism, helping it grow into an enviable accelerator with dozens of technology companies employing as many as 3,800 people and contributing hundreds of millions of dollars to the state economy. He went on to serve on the Board of Trustees until 2015.

"I feel blessed to have worked with Irv, enjoyed his guid-



Photo by Jeff Miller

Irving Shain, former chancellor of the UW–Madison and former chair of the Department of Chemistry in 2010.

ance and wisdom, and appreciated his vision that University Research Park could both strengthen the University of Wisconsin–Madison and help translate research into world-changing products and companies," says Aaron Olver, managing director of the research park. "It's an honor to lead University Research Park and continue to build on Irv's legacy."

Shain's vision extended beyond the sciences. He fought for greater recognition of the arts at the university and endowed two student competitions at the School of Music. He also played a crucial role in establishing ties between American and Chinese universities by founding a thriving student exchange program in 1979. He led delegations to China and welcomed Chinese scholars to Madison, in turn helping place American students at Chinese universities.

"(He) really focused around helping other people and creating a lasting legacy called the UW that would ultimately continue to thrive well beyond when he was chancellor," says his son Paul.

Shain was born on Jan. 2, 1926, in Seattle. He served in the Army during World War II and went on to earn a Ph.D. in chemistry at the University of Washington after the war. He began teaching at UW–Madison in 1952 and would go on to serve as provost and vice president for academic affairs at his alma mater from 1975 to 1977 before returning to Madison to serve as chancellor.

Shain was a noted scholar and mentor, publishing seminal research in the field of electrochemistry. He served as mentor and role model for students and colleagues in academia and industry, including Richard S. Nicholson, a student who went on to serve as chief executive officer of the American Association for the Advancement of Science.

He was preceded in death by his wife of 68 years, Millie, in 2015. He is survived by four children, Kathy, Steve, John and Paul, and three grandchildren, Nathan, Isabel and William.

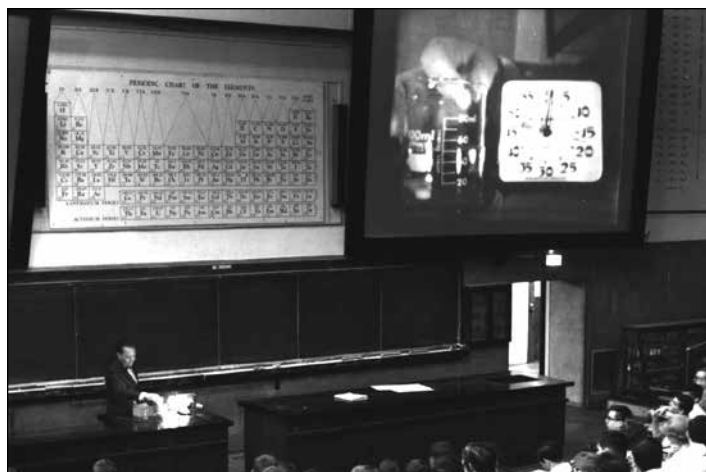


## William Thomas ‘Tom’ Lippincott

**William Thomas “Tom” Lippincott**, who was visiting professor of chemistry and directed the Institute for Chemical Education from 1984 to 1986, passed away in September 2017, from pancreatic cancer.

Tom was Editor of the Journal of Chemical Education from 1967 to 1979. The depth, lucidity and humanity of his monthly editorials were legend.

An innovator, Tom was an early user of technology to enhance education and he initiated the ACS’s Chemistry in the Community (ChemCom) project, which treated high-school-chemistry concepts within the context of societal issues. The ChemCom textbook led to similar approaches at the college level, including Chemistry in Context, the textbook currently used in Chemistry 108 here in Madison.



Tom Lippincott demonstrating chemical kinetics at Ohio State University, circa 1970.

## We remember other friends, faculty & alumni below

### 2016

- 8/1 John C. Sherburne, former stockroom employee
- 8/20 Robert Howard Whitlock

### 2017

- 1/9 James Gross, MS 1962
- 1/12 Michael Thomas Elliott, BS 1973
- 1/18 Alvin Frisque, BS 1948, Ph.D. 1954
- 1/19 Howard Palmer, PhD 1952
- 1/27 Howard William Whitlock, Ph.D. 1961
- 2/7 Richard James Pfeifer, former employee
- 2/21 Margaret Mae *Peggy* Rendall, BA 1945
- 3/3 Russell Kriese, BS 1957
- 4/4 Herbert Litvak, Ph.D. 1974
- 4/5 Richard Boomer, BS 1949
- 4/6 Ching-Yun Tseng, Ph.D. 1965
- 4/8 John Bade, BS Chemistry 1966, Engineering 1967
- 4/10 Richard Gueldner, BS 1957
- 4/14 Arthur Lueptow, BS 1949, MS Biochemistry 1950
- 4/14 John Neptune, MS 1949
- 4/15 Phil Kammerer, BS 1964, Engineering 1967
- 4/29 Darwin Mayfield, Ph.D. 1950
- 5/6 Robert Searls, BS 1953
- 5/22 George Robbins, BS 1951
- 5/31 Fred Kummerow, BS 1939, MS Biochemistry 1941, Ph.D. Biochemistry, 1944
- 6/12 Harold F. Deutsch, Ph.D. 1944
- 6/12 James Hornig, MS 1952, Ph.D. 1955
- 6/14 Margaret Grant, MA 1948
- 6/19 Marian Elez, BS 1962
- 6/20 James Nichol, Ph.D. 1948
- 6/26 Daniel Turluck, BS 1955
- 6/29 Ruth Polin, MS 1950
- 9/23 Stephen Nelsen, emeritus professor
- 7/24 Harry Krall, MS 1951
- 8/19 Robert Harris, Ph.D. 1951
- 9/2 Irving Domskey, BS 1951, Ph.D. 1958
- 9/6 Marietta Schwartz, Ph.D. 1988

- 10/5 Willis D. Waite, MA 1956
- 10/11 Richard Steil Berger, Ph.D. 1954
- 10/21 Gilbert Stork, Ph.D. 1945
- 10/24 Patrick R. Menden, BS 2009, MS 2009 Public Health
- 10/31 Wilbur A.G. Voss, BS 1949, BS Pharmacy 1957
- 11/6 Thomas Ehlert, BS 1957, MS 1958, and Ph.D. 1963
- 11/7 Robert Elbert Burks, MS 1942, Ph.D. 1948
- 11/12 Donna Seiler Estry, BS 1962, MS Library Science 1963
- 11/20 George William Headley, MS 1988
- 11/26 Harold Schick, Ph.D. 1951
- 12/2 Edwin Vedejs, Ph.D. 1966, organic professor at UW

### 2018

- 1/16 Jeffrey Paul Davis, BS 1967
- 1/31 Robert A. Keller, BS 1951, MD 1958
- 2/13 William Maeck, BS 1953
- 2/13 Shirley Bach, Ph.D. 1957
- 2/18 Kenneth Schulz, BS 1957
- 2/18 Kenneth E. Dempsey, BS 1961
- 2/24 Maurice Shamma, Ph.D. 1955
- 2/28 Jean Thomas, BS 1949
- 3/31 Robert Lichter, Ph.D. 1967
- 4/08 Margherita Voelker, BA 1952
- 4/17 Aubrey Francis Messing, BS 1953
- 5/16 Albert Milun, BS 1946, MS 1947, Ph.D. 1951
- 5/24 Robert Turner, MS 1949, Ph.D. 1950
- 5/26 Robert S. Moore, BS 1955, Ph.D. 1962
- 6/01 Terry Spennetta, BS 1966
- 6/13 David Dion, MS 1973, Ph.D. 1974
- 7/30 Maynard Olson, BS 1951
- 7/31 Lester Zank, BPH 1952
- 10/3 Claudia Aldrich, BS 2015, graduate student
- 11/6 Laurens Anderson, Ph.D. Biochemistry 1950

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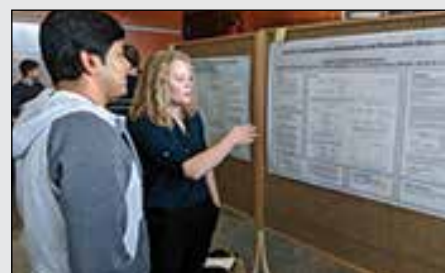
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# Education & Experience



University of Wisconsin organic chemistry laboratory (CHEM 346) students presented posters in the lobby of the Shain Research Tower (12/12/17). The course, taught by Organic Laboratory Director Dr. Nicholas Hill, helps students learn and practice research and presentation techniques. Top Right: Gabriela Negrete, a University of Wisconsin senior chemistry undergraduate, explains her organic chemistry laboratory (CHEM 346) poster, Synthesis of Chiral Bioxazoline and Bisoxazoline Ligands, to Jessica Roberts, a teaching assistant for the course and graduate student with the Schomaker group. Bottom Right: Ali Eichten, a University of Wisconsin senior chemistry undergraduate, explains her organic chemistry laboratory (CHEM 346) poster, Synthesis and Application of Bioxazoline and Bisoxazoline Derivatives, to Amit Das, a post-doc with the Stahl group.

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