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2007 BADGER CHEMIST

Matthew Sanders  Sue Martin-Zernicke
Editor          Editorial Assistant

Designed by the Instructional Media Development Center
School of Education, University of Wisconsin–Madison

Linda Endlich
Art Direction

Amanda Schmitt & Amy Young
Production Assistance
Dear Badger Chemists,

Of all the highlights over the last several years, none compares to the outstanding leadership provided by Jim Skinner. Having now completed his three-year term as Chemistry Department Chair, Jim turned over the keys to me in July for the next three years. I have some big shoes to fill, but I am delighted to welcome you to this year’s Badger Chemist.

It was 31 years ago, 1976, that I first stepped into the UW–Madison Department of Chemistry as an 18-year-old freshman. Over the next four years, my life was transformed by the UW faculty, staff, and students, who provided an outstanding intellectual environment, incredible opportunities for research and learning, and mentoring to expand my horizons. In the 17 years since returning to UW as a faculty member, I've continued to be impressed by the fact that these same traditions of excellence and high level of dedication continue to be hallmarks of our department. Yet, scientific excellence and dedication alone don’t make a Department great. It's the people within—the faculty, staff, students, and alumni—who share a common vision of bettering lives through higher education. It is with great honor that I am able to follow in the footsteps of my predecessors and lead the department forward as I begin my term as Department Chair. I hope you, as alumni of this great Department, will join me on this shared journey.

Inside this Badger Chemist you will find highlights of many of the activities of the last year. Our department continues to excel by all measures, with faculty, staff, and students garnering many prestigious awards for research, teaching, and public service. Our department truly exemplifies the “Wisconsin Idea” – that the university extends to the borders of the state, and increasingly, around the globe. At the Spring ’07 ACS meeting we hosted an Alumni Reception with over 100 attendees and had a wonderful time re-connecting with many of our alumni and friends.

Among many new initiatives, one of particular importance is an effort to increase the diversity of our students, faculty, and staff. Our Diversity Committee, under the leadership of Mark Ediger, is engaging the entire department in the development of policies and activities to enhance our success. We continue to make progress in addressing the needs of women chemists and are working to increase our inclusion of other under-represented groups. Andrew Greenberg has spearheaded an effort to provide summer research opportunities at UW for undergraduate students from minority-serving institutions. We’re working to establish a partnership with Howard University, and I’m especially excited about efforts to start a student chapter of NOBC-ChE, the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers.

Maintaining our high level of excellence requires not only time and effort, but also requires financial resources. Decreases in state funding for the university are forcing us to rely more and more on our own resources just to maintain the status quo, while new initiatives such as our efforts to increase diversity must be funded primarily from gifts.

As you read this year’s Badger Chemist, I hope you will take some time to reflect on your own experiences and how your own career may have been transformed by past or current members of our department. If you are so inclined, your financial support will help to ensure that the next generation of Badger Chemists will be able to enjoy the same tradition of excellence that you and I did. Your generosity plays a key role in our ability to maintain that tradition and is very much appreciated. The Badger Chemist lists various accounts maintained by the UW Foundation. If you are interested in a special gift or donating to an area you don't see listed, feel free to contact me and I’ll be happy to discuss how we can meet common goals.

Irrespective of whether you can help financially or not, we want to foster close connections to our alumni, and we would love to hear about your own activities. If you wish to share them with the rest of the UW chemistry community, we will publish them in the next Badger Chemist. What better way to re-connect with long-lost friends? We are always happy to arrange visits to the department. We plan to host another Alumni Reception at the spring ’08 ACS meeting in New Orleans and hope you will stop by to see old friends, make new friends, and join me on our shared journey of bettering people’s lives.

Bob Hamers
Chair, Department of Chemistry
chair@chem.wisc.edu
Our Awards

UW Chemists continue to garner significant awards.

FACULTY AND STAFF AWARDS

Song Jin and Helen Blackwell each won a DuPont Young Professor Grant. These very highly selective grants (15 awarded nationally – 10 to U.S. researchers) are given to exceptional young chemists and engineers performing outstanding and influential research. Two winners from our department is truly outstanding!

Dr. Rodney Schreiner and Dr. Mark Wendt were mentioned in the *Isthmus* weekly newspaper among the top teachers on campus, based on their rankings at the website RateMyProfessors.com. The article by Adam Hinterthuer named five lecturers and professors with ratings of 4.5 or above, and Rodney and Mark were among those.

Matt Allen, a postdoc in the Kiessling and Raines groups, won a prestigious “Pathways to Independence” grant from the NIH. This new program funds scientists at the end of their postdoc years, through the first few years of a faculty position, facilitating the transition.

John Berry was the first winner of the Ernst-Haage Prize in Bioinorganic Chemistry. The Ernst-Haage Prize of the Max-Planck Institute for Bioinorganic Chemistry in Muelheim an der Ruhr was created in 2006 and is given annually to a doctoral or postdoctoral research associate who has made a major contribution to the area of bioinorganic chemistry.

Helen Blackwell won a Focused Giving Grant from the Johnson & Johnson Company. This completely unrestricted grant provides funding for her exciting and pioneering research on biofilms and quorum sensing, and their understanding and control through organic chemistry.

Helen was the recipient of a 2007 Camille Dreyfus Teacher-Scholar Award. These coveted awards (of which 15 were given nationally) recognize outstanding contributions and promise for research and education in the chemical sciences.

Helen was also the recipient of a 3M Non-tenured Faculty Award. This award, provided by the 3M Company, acknowledges her exceptional creativity and promise, and provides flexible research funds. In addition, she was named one of *Popular Science* magazine’s “Brilliant 10”, a group of ten young scientists cited for doing work that is pushing their field to the next level. Helen was interviewed and profiled in the October issue of the magazine.

Joshua Coon received a major award from the Arnold and Mabel Beckman Foundation for his research on “Gas-phase coordination chemistry for rapid, robust whole protein sequence analysis.” To win this highly prestigious award requires successful competition at both the university and national level. Josh also won a Research Award from the American Society for Mass Spectrometry, funded by Applied Biosystems/Sciex. The award was presented to Josh at the ASMS meeting in June.

Sam Gellman won the ACS Ralph F. Hirschmann Award in Peptide Chemistry for “outstanding achievements in the chemistry, biochemistry and biophysics of peptides.” Merck Research Laboratories sponsored the award.

JCE Software, a publication of the Journal of Chemical Education, won the Pirelli International Award in Chemistry, the world’s first Internet multimedia award aimed at the diffusion of scientific and technological culture worldwide. The award is given in the fields of math, physics, chemistry and life science. The JCE entry in the chemistry category of the 11th Edition was the Chemistry Comes Alive! Series. The prize consisted of a cash award, a plaque and a trip to Rome for Jon Holmes, JCE Software editor.

Song Jin was named one of MIT Technology Review magazine’s TR35 for the year 2006. TR35 is a group of 35 top innovators in diverse areas spanning medicine, computing, communications, nanotechnology, etc., all under the age of 35. Song also received a Cottrell Scholar Award from the Research Corporation for his work on nanoscale magnetic semiconductor materials for spintronics. Only ten of these prestigious awards are given each year.

Laura Kiessling was elected to membership in the National Academy of Sciences. Only 72 new members in all fields are elected each year, so this is one of the highest honors to which a chemist can aspire. Election to this body signals Laura’s achievements in chemical biology as truly outstanding. Laura also won the ACS Francis P. Garvan-John M. Olin Medal for “distinguished service to chemistry by women chemists.” The Olin Corporation sponsored the award.

Berta Ostrander (Grants Specialist) was the recipient of an L&S Classified Staff Excellence Award for outstanding performance and service to the Department and College.

Ron Raines was admitted as a Fellow in the Royal Society of Chemistry, the largest chemical society in Europe with over 43,000 members. Ron will now be known as Ron Raines, FRSC.

Ron also was the winner of the 2007 Makineni Lectureship Award, sponsored by the American Peptide Society. This award is given once every other year to recognize an individual who has made a recent contribution of unusual merit to research in the
field of peptide science. In Ron’s case, the award was for his outstanding and exciting work on synthetic collagen.

Shea Ramey, an academic staff member in the Chemistry Learning Center, was the recipient of the L&S Early Career Award. This award recognizes individuals who demonstrate outstanding performance in their position, show substantial promise of future contributions, and demonstrate a high degree of professionalism.

Tom Record was elected to fellowship in the American Academy of Arts and Sciences. The American Academy, founded in 1780, is the country’s oldest learned society honoring humanities, public affairs and business. Previous fellows include George Washington and Benjamin Franklin, this year’s class of new fellows includes Albert Gore and Emanual Ax.

Hans Reich won the Arfvedson Schlenk Award from the Gesellschaft Deutscher Chemiker (German Chemical Society) for his outstanding research in organolithium chemistry. The award is named after Gustav Arfvedson, the chemist who discovered the element lithium in 1817 and William Schlenk, a pioneer in organolithium chemistry. Hans received his award in Ulm at the GDCh Science Forum.

Bassam Z. Shakhashiri was presented with the National Science Foundation Public Service Award for extraordinary contribution to promote science literacy and cultivate the intellectual and emotional links between science and the arts for the public. His award was presented in Washington, D.C. at the State Department.

Shannon Stahl received a Romnes award from the University of Wisconsin. These awards go only to the most accomplished young faculty in the University. The GSFLC (Graduate Student-Faculty Liaison Committee) presented an Outstanding Mentor Award to Shannon.

Frank Weinhold won the 2007 Lise Meitner-Minerva Center Lectureship Award for Computational Quantum Chemistry, sponsored by Technion and Hebrew University, for the application and development of NBO-based techniques for the analysis of chemical structure, bonding, and reactivity. Frank visited Israel to deliver his award address.

Dr. Mark Wendt received the Chemistry Department’s 2006 James W. Taylor Excellence in Teaching Award. The award was presented at the December ceremony where Mark gave an address.

Tehshik Yoon won an NSF Career Award for his outstanding and innovative research in organic synthesis.

Marty Zanni won the 2006 Coblentz Award. The Coblentz Society, whose mission is to foster the understanding and application of vibrational spectroscopy, gave this award. Marty received the award and presented a lecture at the Ohio State University International Symposium on Molecular Spectroscopy.

STUDENT AWARDS

Student scholarships and research awards are made possible by generous donations from alumni, friends, and companies that recognize the value of awards allowing both graduate and undergraduate students to spend more time on research, one of the strengths of this institution. Gifts like these from alumni, faculty, and friends of the Department allow us to make a difference in the academic and professional lives of our students. Teaching awards come from both Departmental and campus sources, and recognize the Department’s second fundamental mission – exceptional teaching at both the undergraduate and graduate levels. In this section we salute not only the fine students who have worked hard to earn these honors, but also the donors who have made them possible. In addition, we acknowledge students who have won awards outside the Department.


Ben Gorske (PhD ’07, Blackwell) won the 2006 M. J. Collins Award sponsored by the CEM Corporation. The award, which recognizes outstanding research by a student in the field of microwave chemistry, was presented at the San Francisco ACS meeting.

Beth Landis (Hamers) is to be congratulated for receiving the 2007–2008 Merck Research Laboratories Fellowship in Analytical/Physical Chemistry. Merck awards this academic year fellowship to an outstanding UW Chemistry student doing research in analytical/physical chemistry. Beth is a third-year student in the Hamers group.

Luke Lavis (Raines) won an ACS Division of Organic Chemistry Graduate Fellowship. This Fellowship included a research stipend and a travel allowance to attend the 2007 National Organic Symposium.

Graeme McAlister (Coon) was the recipient of the 2007 Gary Parr Memorial Award. The award, presented bi-annually to an outstanding graduate student in the area of biological chemistry, included a generous monetary award and the opportunity to present a special seminar for the department. Dr. Gary Parr, who did his Ph.D. work with Professor James Taylor and later worked for Professor Lloyd Smith in the area of mass spectrometry, died unexpectedly in May 1993 while working at the UW–Madison. His family set up a fund in his memory, making this award possible. A sincere thank-you to the Parr family for this endowment.

Christine McInnis (Blackwell) won a National Defense Science and Engineering Graduate Fellowship starting 2007–08. This award, sponsored by the Air Force Office of Scientific Research, supports three years of graduate research.

Samira Musah (Kiessling) won a National Science Foundation Graduate
Research Fellowship starting September 2007. This nationally competitive award is made to outstanding graduate students who contribute significantly to research, teaching and innovations in science and engineering. The award provides three years of funding. Samira was admitted to the Analytical Program in 2006.

**Brian Popp** (PhD ’07, Stahl) won the 2006 Perkin Scholarship. This prestigious award is sponsored by the Society of Chemical Industry and is affiliated with the 2006 Perkin Medal, won this year by Dr. Jim Stevens of Dow Chemical. The scholarship included a cash award and a trip to the Perkin Medal dinner in Philadelphia.

**Chris Scarborough** (Stahl) won one of four Sigma-Aldrich Innovation Awards for Methodology in Organic Synthesis. Chris received a stipend for research and travel, and participated in the award symposium at Sigma-Aldrich. Chris was also selected to receive an ACS Division of Organic Chemistry Graduate Fellowship, sponsored by the Nelson J. Leonard Fellowship and Organic Synthesis, Inc. The Fellowship consisted of a research stipend and travel award for the National Organic Symposium.

**Andy Schmitt** (Jin) won a Poster Award at the 2006 Materials Research Society Fall meeting in Boston. His poster was entitled “General synthesis and properties of novel transition metal silicide nanowires.” Only ten poster awards were given out of 1,000+ posters across 40+ symposia.

**Matt Shoulders** (Raines) won a 2007–2008 ACS Medicinal Chemistry Fellowship. This was one of only eight such fellowships given nationwide.

The Outstanding TA Awards for 2005–06 were presented in December 2006 at the Excellence in Teaching Symposium. TAs and Faculty Assistants are selected to receive these awards each year on the basis of excellent teaching evaluations from students, faculty and staff. Awardees included: **Angélica Abruna-Rodríguez, Kevin Chau, Tanya Cordes** (Landis), **Robert Holiday** (PhD ’06, Crnm), **Kristy Kounovsky** (Schwartz), **Yu-Shan Lin** (Skinner), **Amir Nimunkar** and **Rebecca Splain** (Kiesling). Congratulations to these outstanding teaching and faculty assistants. Their efforts and accomplishments within the department are greatly appreciated.

The department regularly recognizes both graduate and undergraduate excellence. Fellowship/Awards Committee members for 2006–07 included Chair Frank Weinhold, Helen Blackwell, Gery Eisenmacher, Mahesh Manthappa and Paul Treichel. Their efforts in selecting students for the various awards are greatly appreciated.

Undergraduate research support was provided during Summer 2007 from the following sources: **Alexandra Dillon** (Gellman) received the Eugene and Patricia Kreger Herscher Scholarship, **Ryan Drake** (Gellman), **Thomas Kuech** (Zanni) and **Justin Woods** (Yoon) were awarded Student Support in Chemistry Scholarships, and **Jacob Felder** (Zanni) was selected to receive the Wayland Noland Undergraduate Research Fellowship.

Scholarships for the 2007–08 academic year were awarded in May 2007. **A Walter W. & Young-Ja C. Toy Scholarship** and the **Ackerman Scholarship** are supporting **Kittikhun Wangkanont**. Kittikhun also received the Excellence in Physical Chemistry award from the local section of the ACS. Also receiving Ackerman Scholarships were **Jacob Felder**, **Thomas Kuech**, and **Justin Woods**. **Jacob Felder** was also selected to receive the Edward Panek Memorial Scholarship.

**Dennis Fournogerakis** and **Daniel Lecoanet** received Student Support Scholarships for the academic year. The **Martha Gunhild Week Scholarship** also will support **Dennis Kevin Gams** was awarded the **Edwin M. and Kathryn M. Larsen Scholarship**.

**Alexandra Dillon** received the Mabel Duthey-Reiner Scholarship. **Ryan Drake** was awarded the Richard Fischer Scholarship. **Vanessa Kung** received the Walter W. and Young-Ja C. Toy Scholarship, as well as the Andrew Dorsey Memorial Scholarship. **Molly Miller** will benefit from the Margaret McLean-Bender Scholarship.

National Starch & Chemical Foundation Scholarships were presented to **Anton Milnar**, **Matthew Oboiokovitz** and **Benjamin Strick**. The Kimberly-Clark Undergraduate Scholarship in Chemistry was awarded to **James Birrell Elizabeth Radke** was the recipient of the Eugene & Patricia Kreger Herscher Scholarship for 2007, while **Anthony Nguyen** and **Amanda Turek** received Wayland Noland Undergraduate Research Fellowships.

**Robert Erdmann**, **Daniel Lecoanet** and **Ian Mandel** were recipients of the ACS/Daniel S. Shek Awards for Undergraduate Research. Awards from the Wisconsin Section of the American Chemical Society went to **Jody Epstein** and **Eric Johnson** (Organic), **Casey Jones** (Analytical), and **Thomas Moran** (Inorganic).

Excellence in General Chemistry classes is recognized with several sets of awards. **Kara Barnhart**, **Margaret Bartos**, **Edward Sippel** and **Pei-Kang Wei** were presented the **John and Betty Moore Awards for Excellence**. **Francis Craig Krauskopf Memorial Awards** given to **Laura Hepokoski**, **Peter Kelly**, **Evan Peissig**, **Timothy Pian**, **Andrew Prigge** and **Melanie Rawlings** provided financial support for outstanding achievements in freshman chemistry classes. Nominated by respective professors and endorsed by the selection committee, these students represent the best of our general chemistry students!

The **Hypercube Scholar Award** was given to **Grant Smith** for scholastic excellence in Chemistry. **David Bunc** was presented with the **Alpha Chi Sigma Alumni-Endowed Scholarship**.

**Amber Krummel** (PhD ’07, Zanni) received the **GSFLC Outstanding Mentor Award** to a graduate student.

Graduate fellowships and awards play a vital part in the support of the department’s graduate students. “Excellence in Research” awards were presented to the following students: **Erik Hadley** (Organic, Gellman), **Prabuddha Mukherjee** (Physical, Zanni), **Brian Popp** (Inorganic, Stahl), **Mark Rickard** (Analytical Wright) and **Kiu Yuen Tse** (Materials, Hamers). Each of the graduate students presented a brief talk at the awards ceremony held on May 11th in Seminar Hall.

**Matt Christianson** (Landis) was recognized for his outstanding work as the recipient of the **Paul Bender Fellowship**, while **Matt Dodge** (Burke) was awarded the **Abbott Labs Fellowship in Synthetic Organic Chemistry**. The **Ralph F. Hirschmann-Daniel H. Rich Graduate Award in Bioorganic Chemistry**
was awarded to Ben Gorske (Blackwell) and Luke Lavis (Raines). Lingyin Li (Kiessling), Kristin Plessel (Reich) and Chris Scarborough (Stahl) will benefit from funds awarded through the Harlan Goering Organic Chemistry Fellowship. The Farrington Daniels Ethical Leadership Fellowship was given to Diane Nutbrown (Moore) for her leadership in the ICE program and qualities shown throughout her career at UW–Madison. The final graduate award was the Leah Cohodas Berk Award for Excellence presented to Laurel Pegram of the Research group.

Julee Byram (Mecozzi), Olivia Johnson (Brunold) and Samira Musah (Kiessling) were all recipients of Advanced Opportunity Fellowships from the UW–Madison.

Outside competitive fellowships and traineeships contribute greatly to the ongoing support of our students. In 2006–07, Katie Alfare (Kiessling), Matt Christianson (Landis) and Katherine Vanhevelen (Brunold) were supported by National Science Foundation Fellowships. These fellowships continue for all three students in 2007–08. Soo Hyuk Choi (Gellman) was benefiting from a fourth year of support from the Samsung Corporation in Korea. Robin Chi (Gellman) and Vicki Wilde (Burke) were recipients of one-year Abbott Fellowships. Mark Rickard (Wright) was the Merck Fellow, and Laura Wysocki (Burke) was in her final year of a Lucent Fellowship.

Matt Shoulders (Raines) was supported for a third year by a Department of Homeland Security Fellowship, and Joe Binder (Raines) was in the third year of his National Defense Science and Engineering Graduate Fellowship. Andrew Huisman (Keutsch) will receive support for three years from a Department of Defense Fellowship.

The National Institutes of Health provides a large number of fellowships and traineeships to students across many departments at the University of Wisconsin-Madison. Traineeships usually provide up to three years of support, so they are a very significant component of a student’s support package while they are pursuing their Ph.D. In 2006–07, Heidi Behrens (Li), Emily Dykhuizen (Kiessling), David Good (Coon), Luke Lavis (Raines), Graeme McAlisters (Coon), and Brian Smith (Dent) were supported by NIH Biotechnology Traineeships. Brooke Richardson (Gellman) started her Biotech Traineeship in June. NIH Molecular Biophysics Traineeships were given to Benjamin Bratton (Weisshaar) and Colin Ingram (Weisshaar). NIH Chemistry-Biology Interface (CBI) Traineeships were awarded to Maren Buck (Lynn), Christie Guevarra (Hsung), Christopher Marvin (Burke), David Michaels (Yoon), Kim Peterson (Gellman) and Josh Price (Gellman). Ryan Hilger (Smith), Josh Mandir (Smith), Tim Schramm (Schwartz) and Danielle Swaney (Coon) all benefited from NIH Genomic Sciences Traineeships. Stephanie Cape (Li) and Michael Santiago (Burstyn) received National Research Service Award (NRSA) Fellowships.

DEPARTMENT SERVICE AWARDS

At the 2006 Chemistry Department holiday party in December, Mary Kay Zimmerman (left) received a citation for having served in the Department more than 15 years.

Patti Puccio was honored for over 35 years of service.
New Badger Chemists

August 2006

Mithra Beikmohamadi (Moore)
Investigating Visuospatial and Chemistry Skills Using Physical and Computer Models

Matthew Daniel Bowman (Blackwell)
The Small Molecule Microarray Synthesis Platform: Development and Applications in Chemical Biology

Amanda June Brooks (Brunold)
Spectroscopic and Computational Studies of Adenosylcobalamin-Dependent Enzymes and their B12 Cofactors

Adam Thomas Fiedler (Brunold)
Spectroscopic and Computational Studies of Metal-Thiolate Interactions in Metalloenzymes and Related Model Complexes

Shane Flickinger (Belshaw)

Qiang Fu (Li)
Global Analysis of Neuropeptides in a Small Nervous System and Mass Spectrometric Study of Gas-Phase Fragmentation of Protonated Biomolecules

Eric Christopher Fulmer (Zanni)
Measuring Couplings and Probing Environments Using New Pulse Sequences in Two-Dimensional Infrared Spectroscopy

Eric Christian Hansen (Lee)
Ruthenium-Catalyzed Enzyme Couplings: Reactivity, Selectivity and Synthetic Utility

Gregory Huston Hanson (Burke)
Synthetic Studies of Halichondrin B Subunits

Robert Jacob Holiday (Crim)
Mode- and Bond-Selective Reaction of C-H Stretch Excited Monodeuterated Methane with Chlorine Atoms

Shane M. Lamos (Belshaw)
Design, Synthesis and Evaluation of New Chemical Probes in Proteomics and Metabolomics

Shuzhou Li (Shinner)
Spectral Diffusion and Vibrational Energy Relaxation of Azide in Water
Susan Przybylinski Lucas (McMahon)
Synthetic and Spectroscopic Studies of Organic Reactive

Brian Stuart Lucas (Burke)
The Total Synthesis of Phorboxazole B

Marie Kathleen Mapes (Ediger)
Dynamics in Model Supercooled Liquids: Self-Diffusion in O-Terphenyl and Indomethacin

Reagan L. Miller (Lee)
1. Formation and Use of Silyl Ethers in Enzyme Metathesis
II. Synthetic Efforts Toward the Natural Product Ingenol

Justin Keith Murray (Gellman)
Combinatorial Synthesis of Beta-Peptides with Microwave Irradiation: Toward the Discovery and Development of Protein-Protein Interaction Inhibitors

Ryan Christopher Nelson (Landis)
3,4-Diazaphospholane Ligands: Syntheses, Properties, and Applications to Catalysis

Bei Nie (Smith)
 Genome-Wide Human SNP Genotyping Using the Surface Invasive Cleavage Assay

Samuel Robert Pazicni (Burstyn)
Towards Understanding the Role of the Heme Cofactor in Cytochrome B-

Sai Ganesh Ramesh (Sibert)
Spectroscopy and Dynamics of Haloforms in the Gas and Condensed Phases

Govardhan Patluri Reddy (Yethiraj)
Theoretical and Computational Studies of Solvent Effects on Complex Fluids

Jordan Ryan Schmidt (Skinner)
Linear and Non-Linear Vibrational Spectroscopy of Water and Aqueous Solutions

Jennifer Nicole Slaughter (Mecozi)
I. Design and Synthetic Efforts Towards a Novel Endohedral Receptor
II. Synthesis and Characterization of a Novel [Poly(ethylene glycol)] Fluorocarbon-Phospholipid Conjugate

Bong June Sung (Yethiraj)
Computer Simulations and Liquid State Theoretical Studies of Disorder in Complex Fluids

Michael Nelson Weaver (Nelsen)
Computational Elucidation of Optical Spectra

Rachel Lyn Weller (Rajski)
Design, Synthesis, and Biological Evaluation of Small Molecule Mimics of S-adenosyl-L—methionine

Ting Zheng (Smith)
Lectin Arrays for Prefiling Cell Surface Carbohydrate Expression

December 2006

Mary Jocelyn Cox (Crim)
Vibrational Relaxation and Photoisomerization Dynamics of cis-Stilbene and trans-Stilbene in Solution: Towards Vibrationally Mediated Photoisomerization

Shiping Fang (Corn)
Surface Enzyme Kinetics and Enzymatically Amplified Biosensing of Nucleic Acid Arrays Studied by Surface Plasmon Resonance Imaging and Surface Plasmon Fluorescence Spectroscopy

Christopher G. Hunt (Wright)
Wood Modification by Fungi: Biopulping Mechanism and In Situ Quantitative Imaging of Reactive Oxygen Species
Kyubong Jo (Schwartz)
DNA Polyelectrolyte Behavior Under Confinement: Development of an Integrated Genome Analysis System

Michael Charles Konopka (Weisshaar)
Diffusion in Crowded Environments of Live Cells: Secretory Vesicles in the Actin Cortex and Proteins in the Bacterial Cytoplasm

Wayne S. Kontur (Record)
Kinetic Investigation of the Molecular Processes Involved in the Mechanism of Open Complex Formation Between E. Coli RNA Polymerase and the Lambda PR Promoter

Kimberly Kay Kutz (Li)
Mass Spectral Characterization of Neuropeptides in Cancer Crabs: Method Development and Biological Application

Yuan Li (Corn)
Surface Enzymatic Reactions for Ultrasensitive Surface Plasmon Resonance Imaging With DNA and RNA Microarrays

Senapathy Rajagopalan (Cavagnero)
Conformation and Dynamics of Apomyoglobin N-Terminal Fragments in the Presence of DNAK Chaperone: Implications for Protein Folding

Demian Michael Riccardi (Cui)
Computational Investigations of Long-Range Proton Transfer: Method Validation and Application

Marissa Caren Rosen (Belshaw)
Design and Synthesis of Streptogramin B Analogues

Jack David Sadowsky (Gellman)
Development of Potent, Selective and Biologically-Active Foldameric Inhibitors of BH3 Domain/Bcl-xl Interactions

MAY 2007

Jeanine Marie Batterton (Landis)
Mechanistic Investigations of Zirconocene Alkene Polymerization Catalysts: Reactivity with Alpha-Olefins and Dihydrogen

Yonggui Chi (Gellman)
The Development and Application of Asymmetric Organocatalytic Michael Reactions and Mannich Reactions

Feng Ding (Zanni)
Development and Applications of New Multidimensional Infrared Spectroscopies

Yueheng Jiang (Burke)
Stereoselective Total Synthesis of Antitumor Macrolide (+)-Rhizoxin D

Amanda Catherine Jones (Reich)
Rapid-Injection NMR and Organolithium Reactivity

Andrea J. Lee (Burstyn)
The Biophysical Characterization of the Three Activation States of CooA Through Protein Unfolding Studies

Kevin Michael Metz (Hamers)
Synthesis and Applications of Hybrid Nanowires

Brian Vincent Popp (Stahl)
Experimental and Computational Studies of the Reaction of Molecular Oxygen with Reduced Palladium Species

MAY 2007

Christopher Paul Belmas
Christopher Steven Collington (Li)
Sonia Maria Dragulin-Otto (Nathanson)
Natalie Nicole Hoover (Burstyn)
Pinray Huang (Jin)
Kenneth Lowell Kearns (Ediger)
Steven Daniel Kehoe
Revati Kumar (Skinner)
Claire DeYoung Kehoe
Bin Sun (Hamers)
Kiu Yuen Tse (Hamers)

AUGUST 2006

Lane Ross Alexander
Jonas William Berge
Elena S. Bezrukova
Michelle Lynn Bishop
Jayson James Kempinger
Charles Roger Kinzie
Todd Ryan Lofy
Daniel R. Smith
James Philip Spencer
Melissa Marie Yatzeck

DECEMBER 2006

Fatlume Berisha (Shakhashiri)
Michael Thomas Foley
Janelle Ann Raborn (Keutsch)
Mingjun Yuan (Lee)
Liang Zhang (Ediger)

DECEMBER 2006

Sean Charles Andrews
Anne Elizabeth Brownson
Dustin Cory Frost
Sara Elizabeth Hempel
Brendan Hodis
Elizabeth Ann Hopkins
Adam James Johnston
Leo Anthony Joyce
Andrew Alexander Lafko
David Andrew Maenner
Kari Marie Midthun
Hoa Anh Nguyen Phan
Mark Harold Rambow
Alex Michael Sidney
Lynn Mee Ton

(continued on page 40)
In Memoriam

Sherwin T. Amimoto

(PhD ’79, Cornwell) died unexpectedly on September 19, 2006, at the age of 59, while snorkeling in Maui, Hawaii. Sherwin has been a Research Scientist at Aerospace Corporation in El Segundo, California, for 30 years, and he was in Hawaii to attend a technical conference. Dr. Amimoto was also a talented and award winning bonsai artist.

Professor Walter J. Blaedel

Died Monday, Oct. 8, 2007, in Middleton, at Harbor House Assisted Living. Walter was born in New York City, May 26, 1916, to recent German immigrants. He received his B.A. and M.A. in chemistry from UCLA in 1938 and 1939, respectively, and his Ph.D. in chemistry from Stanford in 1942. During 1941–42, he was an instructor in chemistry at Northwestern University and also a research associate in the Office of Scientific Research and Development. He married Barbara Jeanne Bennett in Hollywood, CA, in 1942. He left Northwestern to join the Manhattan Project at the University of Chicago as a research associate from 1944 until 1946. He then spent a year at the Radiation Laboratory at the University of California—Berkeley and a summer at Oak Ridge, TN, as an instructor in Nuclear Energy for the Propulsion of Aircraft. Walter joined the Analytical Division as an instructor in the Chemistry Department at UW–Madison in 1947. Over the next twenty years, the Analytical Division grew to be among the most highly regarded in the nation. However, during the 1970s and as a full professor, Walter had increasing disagreement with his colleagues over teaching, research and administrative procedures. After his retire-ment from UW–Madison in 1982, he decided to investigate the legal process by the scientific method. His direct engagement in court actions over a period of 20 years produced almost 3000 documents that report his perception of falsification and/or unethical behavior by public officials, particularly in technical and scientific matters that affected the public welfare. Although he lived in Harbor House Assisted Living in declining health for the past eighteen months, he continued to actively fight what he perceived as injustices up until the time of his death. It was his wish that his document collection be accessible to the public at www.drwjb.org. His devoted wife, Barbara, preceded him in death after 62 years of marriage. He is survived by his three sons, Mark (Deborah) of Ames, Iowa, Ken (Jan) of Dublin, Calif. and Bob (Kathy) of Portland, Ore.; as well as his two loving granddaughters, Anna and Emily; and many nieces and nephews. His family has chosen to honor Walter’s request that no memorial service be held. He wishes, instead, that “family, friends, students, and coworkers remember me occasionally, for having shared work, ideals, love, joy and sadness, and success and failure.” The family requests that any memorial donations be directed to Hospice Care at 5395 East Cheryl Parkway, Fitchburg, WI 53711.

Paschaleen Coonradt

A good friend of the Department died December 5, 2005, at the age of 96. Patty established the “Harry L. and A. Paschaleen Coonradt Fund” in 1995 to honor her late husband Harry Coonradt (PhD ’40, Adkins). The fund supports Chemistry Department activities.

Priscilla Anne Jones

(PhD ’68, West) died on August 5, 2007, at the age of 70, of intestinal cancer. Priscilla was born to Priscilla Anne Mullin and William L. Carney in Malden, Massachusetts on April 30, 1937. She attended Wheaton College in Massachusetts, Bryn Mawr College and the University of Wisconsin, Madison, where she earned a Ph. D. in chemistry in 1968. She was among the first females to earn the doctorate in chemistry at the University of Wisconsin. While in Madison she met and married her husband of nearly forty years, Paul. She is survived by Paul; her son, Kevin; her daughter, Anne Carmel Martinez; and her grandchildren, Tent Fleming, Kevin Paul Jones and Jessica Lea Jones. Priscilla served as a research associate and an adjunct professor in the Chemistry Department of the University of North Texas for many years. Because of the difficulties she faced as a female chemist early in her life she wished to establish a scholarship for women studying chemistry, the Priscilla Carney Jones Scholarship. The family requests donations in Priscilla’s memory to the Priscilla Carney Jones Scholarship Fund, 1409 E. Windsor Dr., Denton, Texas 76209.

Virginia Mae Schelar

(BS ’47, MS ’53, PhD ’69, History of Science, Ihde) died October 10, 2006 at the age of 81.

Philip C. Servais

(BS ’39, MS ’40, Hall) died August 19th, 2006, at the age of 89. He was born November 16, 1916 in Madison, WI, to George and Elizabeth Servais. He graduated in chemistry from the University of Wisconsin where he met his wife, the former Pearl Lambrecht. Phil spent his entire career, from 1940 to 1980, at Dow Chemical and Dow Corning in Midland, MI and in Guelph, Ontario. He and Pearl enjoyed 20 years of retirement at their home on the shore of Lake Michigan. Philip is survived by his loving wife of 65 years, Pearl, of Chelsea, MI; their daughter Marita of Ann Arbor; son Paul (Mary) of Boyne City; sister Dorothy (Edward) Olney; brother Bernard (Ruth); brother-in-law Donald Lambrecht; nieces, nephews, and dear friends in Midland, Guelph, and Pentwater. His sister, Georgia Clark, and his brother Wendell preceded him in death. A memorial service was held at the First Presbyterian Church, Ann Arbor, on Saturday, December 2nd. Memorial contributions may be made to Towsley Village, 805 W. Middle St, Suite 4, Chelsea, MI. 48118.
Walter Weiyoun Toy

(BS ‘45, MS ‘46, Wilds) died July 11, 2004, at the age of 80. The “Walter W. and Young-Ja C. Toy Fund” was established in 1997 to provide research opportunities to undergraduates Chemistry majors.

George James Ziarnik

(BS ‘57) died December 28, 2006, at the age of 75. His wife established “The George J. and Arleen D. Ziarnik Scholarship Fund” to honor his memory.

We have also been informed of the following deaths of alumni and friends:

Earl Amott (PhD ’38, Krauskopf) died May 24, 2007, at the age of 94.

John Newton Ashworth (PhD ‘48, Williams) died November 15, 2006, at the age of 86.

Barbara Kathryn Barr (MS ’60, Blaedel) died January 21, 2007, at the age of 71.

Asgeir Bjarnason (PhD ’87, Taylor) died April 23, 2001, at the age of 43.

Virgil Vernon Bogert (BS ’35, MS ’37, McElvain) died November 7, 2006, at the age of 95.

Martin Frank Bretl (BS ’36) died December 20, 2006, at the age of 92.

Bennett G. Buell (PhD ’51, Johnson) died January 18, 2007, at the age of 89.

Rudolf Bunkfeldt (BS ’37) died November 17, 2001, at the age of 85.

George M. Burkert (BS ’38) died November 8, 2005, at the age of 88.

R. Owen Carter (PhD ’39, Williams) died July 7, 2006, at the age of 90.

Albert Claude Christoph (MS ’70, Hirschfelder) died January 30, 2007, at the age of 59.

Jennings Evans Cline (PhD ’76, Dance/Gaines) died September 29, 2006, at the age of 61.

James Daniel D’Ianni (PhD ’38, Adkins) died August 14, 2007, at the age of 95.

Lloyd R. Donle (BS ‘43) died November 24, 2006, at the age of 84.

Robert George Dworschack (BS ’42) died May 26, 2006, at the age of 86.

John Oelhaf Edwards (PhD ’51, Sorum) died November 4, 2005, at the age of 83.

Thomas Walter Evans (PhD ’52, Ritter) died July 25, 2006, at the age of 83.

Helen Marie Fett (BS ’47) died May 9, 2007, at the age of 81.

William Elroy Ginsburg (BS ’35) died April 7, 2006, at the age of 93.

Howard James Glenn (MS ’44, PhD ’48, Johnson) died September 16, 2007, at the age of 87.

Eleanore Clarke Gray (BS ’32) died October 22, 2005, at the age of 96.

Ray Edward Green (BS ’39) died November 14, 2006, at the age of 91.

Patrice Gwinn (BS ’80) died May 11, 2005, at the age of 46.

Milton Christian Hansen (BS ’47) died March 26, 2006, at the age of 89.

Roger Gaurth Hansen (BS ’46) died January 29, 2002, at the age of 81.

Thomas Robert Hodge (MS ’59) died June 13, 2005, at the age of 73.

Mark David Janette (BSE ’88) died November 30, 2003, at the age of 43.

Harold A. Jeskey (PhD ’51, Adkins) died December 22, 2006, at the age of 94.

Robert E. Johnson (BS ’64) died April 21, 2004, at the age of 61.

Francis Kaney (BS ’38) died May 26, 2007, at the age of 91.

Robert Earl Kinney (BS ’42) died December 4, 2006, at the age of 87.

Eugene Victor Kleber (PhD ’43, Sorum) died March 1, 2007, at the age of 86.

Oran Milton Knudsen (BS ’33) died April 6, 2007, at the age of 97.

Harold Karl Krahmke (BS ’40) died September 30, 2006, at the age of 98.

Donald Krasno (BS ’43) died March 10, 2005, at the age of 83.

Sumner Levine (PhD ’49, Ritter) died March 20, 2007, at the age of 83.

Howard Vincent Malmstadt (BS ’43, MS ’48, PhD ’50, Blaedel) died July 7, 2003, at the age of 81.

Dick Markwell (PhD ’56, Holt) died July 29, 2007, at the age of 82.

Fred Harold McCarron (PhD ’56, Goering) died April 2006, at the age of 75.

Albert Leon Myerson (PhD ’48, Daniels) died March 31, 2004, at the age of 84.

Chester O’Konski (BS ’42) died August 2, 2006, at the age of 85.

John Lawrence Oncley (PhD ’33, Williams) died July 14, 2004, at the age of 94.

Irving B. Oneson (BS ’40) died December 25, 2006, at the age of 88.

Daniel Stephen Polcyn (PhD ’65, Shain) died November 2, 2006, at the age of 73.

Berton Charles Pressman (BS ’48) died June 3, 2006, at the age of 79.

Gorman Leonard Quinn (PhD ’51, Bender) died October 31, 2004, at the age of 79.

Louis Frederick Reuter III (BS ’41) died September 5, 2006, at the age of 87.

William P. Riemen (BS ’50, PhD ’55, Daniels) died June 1, 2007, at the age of 78.

Walter Carl Schneider (BS ’41, PhD ’45, Meloche) died February 1, 2006, at the age of 86.

Marvin Morris Smolan (BA ’42) died November 15, 2006, at the age of 85.

Wayne William Umbreit (BS ’34, MS ’36, McElvain) died August 4, 2007, at the age of 94.

John Van Den Berghe (PhD ’52, Wilds) died July 31, 2007, at the age of 84.

William Leslie Welch (BS ’56) died August 2, 2007, at the age of 72.

Alvin Gustav Winger (MS ’48, Bender) died August 9, 2001, at the age of 78.

Harold A. Wooster Jr. (MS ’41) died May 20, 2005, at the age of 86.
DEPARTMENT SEMINARS

Announcements of Departmental seminars are listed on the web at http://www.chem.wisc.edu/news/upcoming.php. Some of the named and special seminars held at the department in the preceding year are featured below, but many other fascinating talks are given each week by faculty, students and guests of the Department.

Emeritus Professor Chuck Casey gave the first Chemistry Colloquium and Hilldale Lecture. He spoke on “New Hydrogenation Catalysts and New Mechanisms for Hydrogenation.” In October, Dan Rich, Emeritus Ralph F. Hirschmann Professor of Medicinal and Organic Chemistry, and Professor Emeritus, Department of Pharmaceutical Sciences spoke on the topic “Rational Drug Design.”

In March 2007, Michael Westrick presented a department colloquium entitled “Commercial Winemaking, Home Winemaking and Careers in the Wine Business.” Dr. Westrick is the Vice President of Winemaking at Sterling Vineyards in California.

Dr. Cynthia Friend of the Department of Chemistry and Chemical Biology at Harvard presented a seminar and workshop highlighting women in Chemistry and gender equality in the science field. Her brown-bag session over the lunch hour was well attended and proved a pertinent topic in today’s field of chemistry.

Department colloquia speakers included UW–Madison notable Dr. Laura Kiessling of the Department of Chemistry and Laurens Anderson Professor of Biochemistry. Her talk centered on illuminating and inhibiting carbohydrate biosynthetic pathways.

The Chemistry Department also continued its efforts in joining forces with other campus departments and offered joint seminars throughout the year. A presentation with Biomedical Engineering offered a talk by Dr. James P. Landers of the Department of Chemistry and Pathology at the University of Virginia. The Physical Chemistry division hosted Professor Linda Nicholson of Cornell University who spoke on topics relating to Alzheimer’s disease. The seminar was jointly sponsored by the PChem division and WISELI – Women in Science and Engineering Leadership Institute.

UW–Madison alumnus Dr. Tom Kelly of Imago Scientific Instruments Corporation presented an informative seminar in October. Hosted by Professor Song Jin of the Materials Chemistry program, Tom is a former Engineering faculty member.

SHAIN COLLOQUIUM SERIES

The Department kicked off its Shain Colloquium series (see Badger Chemist #50 (2006), pp. 16–20) in April, when Professor Daniel Nocera of the Massachusetts Institute of Technology spoke on the “Energy Future of our Planet: Chemistry to the Rescue.” The talk was the first annual Irving Shain Chemistry Colloquium, made possible by donations to the Irving Shain Colloquium Fund at the UW Foundation. Colloquium speakers in fall 2007 included Professor Royce Murray of the University of North Carolina and William Banholzer, Chief Technology Officer of the Dow Chemical Company.

MCELVAIN SEMINAR SERIES

In keeping with the Department’s intent to sponsor talks from a variety of speakers across academia and industry, Professor John Tully of Yale University presented the first McElvain seminar for 2006. His talk, “Dynamics at Metal Surfaces: The Role of Electronic Excitation” proved to be informative for graduate students, faculty and visitors who attended the lecture.

Professor James Heath of the California Institute of Technology spoke on the topic of nanotechnology and cancer in early December. Professor Heath spent a great deal of time interacting with graduate students and faculty alike.

The Organic Division McElvain Series speaker in early 2007 was Dr. Adrian Whittle of Biogen Idec, Inc. Dr. Whittle’s topic was “Expanding the Druggable Proteome.”

Professor Donald Hunt of the University of Virginia presented the Analytical Sciences McElvain Series seminar on the topic of innovative technology for the study of cell signaling host.

HIRSCHFELDER PRIZE

Professor Hans C. Andersen of Stanford University gave the 2006–2007 Hirschfelder Prize lectures in October of 2006. His series of three lectures were titled “A tale of two forces—personal recollections of WCA theory,” “Kinetic Theory of Dense and Super-cooled Liquids” and “Construction of Long-time Markov Models from Short-time Dynamical Simulations.”


SPRAUGE LECTURE SERIES

The Inorganic and Organic divisions hosted the Sprague Lecture series speaker Koichi Komatsu of Kyoto University. Professor Steve Nelsen coordinated this series of lectures on a variety of topics including the organic chemistry of fullerenes.
HONORARY DEGREE AWARDED TO ALAN G. MACDIARMID

Chemistry alumnus Dr. Alan G. MacDiarmid (PhD ’53, Hall) was posthumously awarded the Honorary Degree Doctor of Science from the University of Wisconsin–Madison at graduation ceremonies in May 2007. Dr. MacDiarmid was one of the most illustrious alumni of our Department and University. A native of New Zealand, he spent his professional career as a faculty member at the University of Pennsylvania, where his original research on electrically conductive polymers revolutionized chemistry, physics, and materials science, and created a new generation of technology that impacts our everyday life. For these accomplishments, Prof. MacDiarmid received the 2000 Nobel Prize in Chemistry (with Hideki Shirakawa and Alan J. Heeger).

Prof. MacDiarmid understood that the electrical properties of a new organic polymer (polyacetylene), which had been prepared by Prof. Shirakawa, could be controlled by a process known as “doping”. In this way, a lightweight and flexible plastic material, which is normally a very poor conductor of electricity, could be reversibly converted to a form that is an excellent conductor of electricity. The revolutionary development of an electrically conductive organic polymer transformed materials chemistry and materials science. Subsequent research concerning the preparation, characterization, and application of conducting polymers, in the labs of MacDiarmid, Shirakawa, and Heeger, and in other labs around the world, led to a myriad of technological applications. These applications include flexible, lightweight batteries for cameras and other electronic devices, and organic light-emitting diodes (OLEDs), which are used in color display devices (cell phones and, in a few years, color televisions).

The Department planned to hold a symposium in honor of Dr. MacDiarmid on the occasion of his visit to campus to receive the Honorary Degree. Dr. MacDiarmid embraced the idea, and planned to present the keynote lecture. Sadly, he passed away in February 2007. His wife, Gayle, traveled to Madison for the graduation ceremonies and accepted the posthumous awarding of the Honorary Degree from Chancellor John Wiley. Alan G. MacDiarmid was a scientist and scholar whose extraordinary accomplishments continue to impact our daily lives. As an institution, we are very proud of the achievements of this distinguished alumnus.

ACS CHEMLUMINARY AWARD

The 9th Annual ChemLuminary Award celebration was held on the evening of August 21, 2007 at the national ACS meeting in Boston. The Wisconsin Section received an award for the best activity involving the Student Affiliates and the Section members, for its Chemical Haunted House for Halloween. Outreach Specialist and graduate student Diane Nutbrown, who organized the event, was presented the award. Pictures from left to right above are Kittikhun Wangkanont (Student Affiliates President), Diane Nutbrown, Ieva Reich (Student Affiliates advisor and Wisconsin Section Councilor), Betty Moore, and John Moore.
Departures & Arrivals

DEPARTURES

Allen Clauss, Organic Laboratory Director since July 2001, resigned in August 2007 to spend more time with his youngest sons, who are seniors in high school this year. Allen keeps an appointment as Honorary Fellow, and hopes to Lecture for the Department whenever he can.

Paul Treichel, a professor in the Chemistry Department since 1963, and Chair from 1986 to 1995, became emeritus in June 2007. A Symposium in Paul’s honor was held at the Chemistry Department on October 12, 2007.

Frank Weinhold joined the Chemistry faculty in 1976 and retired in June 2007. Emeritus Professor Hyuk Yu hosted a retirement party for Frank at his farm.

ARRIVALS

Nick Hill (PD ’02–’04, West) started his position as the Assistant Organic Lab Director in January 2007, replacing Andrew Tseng (PhD ’02, Burstyn), who started an MBA program in Michigan. Nick took over as Acting Organic Lab Director when Allen Clauss resigned in August. Nick and his wife Kate have a new son, Odin, born in September 2007.

Debbie Hug arrived in Chemistry in May 2007, and is working with Diana Duff and Gery Essenmacher in the Undergraduate Chemistry Office. Debbie

replaced Sue Martin-Zernicke, who moved to Analytical when Berta Ostrander filled our new Grants Specialist position.

Teresa Knudson joined the Department in December 2006, replacing Dick Terhall in the Mail Room. I was born in Seattle, Washington, lived in Seattle until 1981, and then moved to Madison in May of 1981. I have worked for the State since 1989 doing Shipping and Receiving, and enjoying what I do. I’m married since 2001 to a wonderful man, with no kids and a dog named Jody who runs the house. I enjoy boating on the Madison lakes and fishing when I catch fish.

Dennis Reece joined the Chemistry Department in January 2007. I have been with the University since 1998, starting as Program Assistant in the Veterinary Medical Teaching Hospital. Being Assistant to the Chair of Chemistry has truly been a dream job working around brilliant minds in a positive environment. I studied music in school, graduating with a voice major and piano minor, and pursued my Master’s in Choral Conducting. I have participated in various choral organizations around Madison and have performed with the Madison Opera since 1994. I have one son, who is a struggling actor in Chicago. I bicycle to work as well as long distance rides and am an avid animal lover.

Alan Silver joined the Department in May 2006 and has taken over for Steve Barnet’s role as IT support administrator. Alan received his B.S. in meteorology from Cornell University in 1993 and then a M.S. in meteorology from Texas A&M University in 1995. After graduating from Texas A&M University, Alan started working at the University of Wisconsin—Madison as a meteorologist, but soon transitioned into an IT position at the Space Science and Engineering Center. After Alan’s wife, Marisol, received her Ph.D. in cellular molecular biology from the University of Wisconsin—Madison, the couple moved to Boston where Alan worked as a UNIX and network systems administrator for a start-up company and later for the Harvard Business School. Alan and Marisol moved back to Madison in 2003 to raise their twin boys in the wonderful, relaxing world of Madison. Prior to working at Chemistry, Alan worked on campus for the Department of Biostatistics.

Paul Willadsen came to Chemistry in December 2006, replacing Mike Wilson in the Research Stockroom. Paul came to us from Biochemistry. His hobbies are hockey and Olympic Weightlifting.
Lian Yu received a B.S. degree in chemistry from Peking University and a Ph.D. degree in physical chemistry from The Ohio State University (1991). He was a research scientist in Eli Lilly and Company from 1991 to 2003. He received the Lilly Research Laboratories President’s Award and is a Fellow of the Association of American Pharmaceutical Scientists.

Lian Yu’s laboratory studies how drug molecules self-assemble into solids of different structures and how such assembly can be optimized to pharmaceutical advantage. Although drug actions take place in solution, the solid state of a drug – crystalline or amorphous, neutral or ionic, solvent-free or solvated – significantly affects its delivery characteristics. Solid-state engineering is a viable approach to product improvement and innovation without changing the active ingredient. One emphasis of the laboratory is crystal polymorphism, the ability of the same molecule to crystallize in different lattices. Controlling polymorphism remains an unsolved problem today: some molecules form many polymorphs, while others seemingly none; polymorphs may appear concomitantly and even disappear unexpectedly. The laboratory recently elucidated the nucleation of one polymorph by another, a finding that contradicts common models of crystallization in polymorphic systems. The laboratory studies the thermodynamics, solution chemistry, templated nucleation, conformational energetics, and other factors influencing the polymorphic selectivity of crystallization.

Another emphasis of this laboratory is amorphous pharmaceuticals. Amorphous solids offer special advantages in drug delivery, because of their higher solubility and possibly higher bioavailability than their crystalline counterparts. Amorphous drugs must be stable against crystallization because crystallization negates their advantages. The laboratory studies how crystallization can be enhanced by the surface, how surface-enhanced crystallization can be inhibited with nano-meter thin coatings, and how crystal growth mechanism changes from diffusion-controlled to diffusionless with cooling.

Figure 1.
Diamond, graphite, and buckminsterfullerene are polymorphs of each other: they are made of the same element (carbon), but differ in structures and properties. In the same way, complex organic molecules produce polymorphs and the phenomenon is important to pharmaceutical and chemical developers. In this example, the simple molecule ROY forms at least six polymorphs with different colors and molecular conformations. ROY is the current world record for the number of coexisting polymorphs of known structures. Predicting polymorphs, especially for conformationally flexible molecules such as ROY, remains an unsolved problem.
In its twelfth year under the editorship of John Moore, the Journal of Chemical Education (JCE) continues to serve an important, innovative role in the chemistry community. In addition to a new record of over two thousand pages of published articles, the eighty-fourth volume reaches new heights with helpful online content. JCE’s Chemistry Comes Alive! video collection has won an international award, and the National Science Digital Library grant described in Badger Chemist No. 50 is making a variety of new resources available to subscribers.

**Pirelli International Award**

Chemistry Comes Alive! (CCA!) is a series of CD-ROMs containing chemistry videos collected and edited by John Moore and Jerry Jacobsen, with contributions from dozens of chemistry teachers around the country. CCA! received international attention this year when JCE Online editor Jon Holmes traveled to the Temple of Hadrian in Rome to receive the 2007 Pirelli Award in Chemistry and a prize of 15,000 euros. This is the world’s premier Internet multimedia award. It is aimed at the diffusion of scientific and technological culture worldwide. The CCA! CD collections contain a visual library with more than 2000 QuickTime movies and nearly 15,000 still images. Some of these can be seen every day on a video screen in the main-floor hallway of the chemistry building. Visit [http://www.jce.divched.org/JCESoft/CCA/Pirelli/](http://www.jce.divched.org/JCESoft/CCA/Pirelli/) to view the award-winning entry.

**National Science Digital Library Chemistry Pathway**

As part of a national effort supported by the National Science Foundation, the National Science Digital Library (NSDL, [http://nsdl.org/](http://nsdl.org/)) provides a portal for teachers and students into high quality Web-based educational materials. With major support from the NSF and together with the ACS Education Division and the ChemCollective project at Carnegie–Mellon University, JCE is contributing to the NSDL as the preeminent resource for chemistry education on the Web. Check out our Chemical Education Digital Library (ChemEd DL) at [http://www.chemeddl.org/](http://www.chemeddl.org/) and become a user, reviewer, or contributor!

At present most of the resources in the ChemEd DL have been collected by the JCE and are in the JCE Digital Library, which will be familiar to regular readers of the Badger Chemist. During the past year we have added two more collections: JCE Data-Driven Exercises and JCE Featured Molecules. Data-Driven exercises provide students with a collection of data from the literature and ask students to discover chemical principles from the data. Many are available for physical chemistry and more are sought in all areas of chemistry. See [http://www.jce.divched.org/JCEDLib/DataDriven/index.html](http://www.jce.divched.org/JCEDLib/DataDriven/index.html). Featured Molecules are selected every month from an article in the JCE. They are provided as fully manipulable 3-D Jmol structures so that readers can examine them from all angles and in various formats such as ball-and-stick or space-filling. Two molecules from an October 2007 JCE paper on components of maple syrup are shown on this page: 2,6-dimethoxyphenol and 2,6-dimethylpyrazine. Many others are available at [http://www.jce.divched.org/JCEWWW/Features/MonthlyMolecules/index.html](http://www.jce.divched.org/JCEWWW/Features/MonthlyMolecules/index.html).
The ChemEd DL has a major program of outreach. You will find us at most chemical education meetings, ACS national and regional meetings, and other meetings where science teachers congregate. And you will find us on the Web! In March 2007 ChemEd DL outreach specialist Lynn Diener, together with John Moore and Jon Holmes, led an online Web Seminar sponsored by the National Science Teachers Association (NSTA). There were more than 70 participants, mostly high school teachers, from across the U.S. as well as from Canada and the Dominican Republic. The topic was chemistry of taste and smell. Participants were able to manipulate JCE Featured Molecules, carry out a hands-on JCE Classroom Activity, and view Chemistry Comes Alive! videos. The Web Seminar was a great success, receiving the highest possible ratings from participants. We will conduct a second Web Seminar on Tuesday, October 23, 2007. The title is, “Chemistry Comes Alive II: Sticky Molecules and Protein Folding”. To find out more about future Web Seminars, go to http://learningcenter.nsta.org/products/symposia_seminars/NSDL2/webseminar.aspx. If you or someone you know would like to participate, please sign up at this Web site.

The ChemEd DL and the NSDL make use of the social networking tools now popular on the Web. Beginning in August 2007, John Moore has been blogging his editorials in an NSDL space called “Expert Voices”. Topics so far include resistance to change in undergraduate chemical education, lessons to be learned from an award-winning high school teacher, and chemistry concept inventories (tests). Read and respond at http://expertvoices.nsdl.org/chemeddl/. In the near future we will also have available other blogs and Wikis for communication among groups working on specific areas of chemistry.

Online Textbooks

For many years there have been complaints about the high cost of textbooks. We may have the beginning of an answer to this problem. The JCE Digital Library has a collection, JCE LivTexts, which currently contains two online textbooks of chemistry: Quantum States of Atoms and Molecules and Concept Development Studies in Chemistry. The first section to be developed in what will eventually be a physical chemistry text online, Quantum States of Atoms and Molecules, was written by David Hanson, Theresa Julia Zielinski, Erica Harvey, and Robert Sweeney. It is available at http://www.jce.divched.org/JCEDLib/LivTexts/pChem/JCE2005p1880_2LTXT/index.html. A community of physical chemists is being supported by the ChemEd DL to add to this first section links to the many resources already available within the ChemEd DL and to extend the content of the online textbook to include other areas of physical chemistry such as thermodynamics and kinetics. John Hutchinson of Rice University has created Concept Development Studies in Chemistry, an online textbook for first-year chemistry students. It is at http://www.jce.divched.org/JCEDLib/LivTexts/genchem/ConceptDev/index.html. If you or someone you know are interested in contributing to either of these projects, please contact John Moore (jwmoore@chem.wisc.edu).

Old Favorites Now Online

Thanks to efforts by JCE Online editor Jon Holmes, together with Jerry Jacobsen and Rachael Bain, the complete, eight-CD collection of Chemistry Comes Alive! videos has been converted to streaming video so that it can easily be accessed on the Web. The collection is at http://www.jce.divched.org/JCESoft/Programs/VideoCD/CCA/index.html and is accessible via subscription separate from the JCE subscription. In addition, one of our oldest favorites, Periodic Table Live!, which provides data, description, videos, crystal structure, and much other information about each chemical element, will soon be freely available at the JCE Online Web site. This vast compilation of information and data will be available to all from the JCE. Eventually we expect to have a Wiki so that you can contribute your own information about your favorite element or elements. Information provided in the Wiki will be incorporated into the existing description of the element. To see Periodic Table Live!, go to http://www.jce.divched.org/JCESoft/Programs/VideoCD/PTL/index.html. Two stills from Chemistry Comes Alive! Volume 8 appear on this page. One shows ferromagnetic above a cow magnet; the other shows liquid bromine in a round-bottomed flask.
New TA Handbook Available

A revised and updated version of our Handbook for Teaching Assistants is hot off the press. The Handbook includes sage advice, updated information, and guidance related to teaching today’s undergraduates. Topics include: the role of the TA, how to lead a Discussion or Laboratory Section, how to write a quiz, dealing with academic dishonesty, and enhancing the experience with digital aids. The Handbook also includes useful checklists outlining the responsibilities of the Teaching Assistant and his or her Supervisor. Barbara Sawrey of the University of California, San Diego, spearheaded the revision.

Now Translated into French: Chemical Adventures of Sherlock Holmes

The Chemical Adventures of Sherlock Holmes is a compendium of 15 stories written by Thomas G. Waddell and Thomas R. Rybolt and originally published in the JCE. The stories were collected under the direction of Erica K. Jacobsen of the Journal staff into a single volume with standardized formatting and consistency among stories. They have now been translated into French by Paul Depovere and published by Dunod under the title, L’affaire des cristaux jaunes et autres énigmes. To order the French translation, go to http://www.dunod.com.

Visitors and Personnel

This summer we again enjoyed a two-month visit from NSDL Co-PI Theresa Zielinski. Theresa is a professor at Monmouth University in New Jersey, and she spent her time here developing online resources for instructors in physical chemistry and symbolic mathematics. In addition, visiting scholar Xavier Prat-Resina is currently working with us to develop additional online resources for the ChemEd Digital Library. Xavier recently completed post-doctoral studies with Qiang Cui in our department. In July we were visited for two days by Tony Masters, who is Professor of Chemistry at the University of Sydney. Another collaborator is Tom Holme, Director of the ACS Exams Institute at the University of Wisconsin–Milwaukee. The ChemEd DL recently received an NSF grant to work with the Exams Institute to enhance our bank of test questions and use ChemEd DL metadata to help create criterion-referenced exams that will eventually be published as ACS Exams. The JCE QBank collection can be found at http://www.jce.divCHED.org/JCEDLib/QBank/index.html.

To achieve the goals we proposed for the NSDL Pathways grant, we have hired several new people with expertise in Web-based development and outreach.

Robert Anglin comes to us with a wealth of academic and industrial research experience. Robert obtained a Master’s degree in Chemistry from the University of Iowa two decades ago with an emphasis in bioorganic chemistry. Robert is in the process of customizing the open-source document management software for JCE and the ChemEd DL. This new system will manage documents, enable electronic submission, and facilitate electronic communication between JCE staff, reviewers, and contributors.

Another wonderful addition to the ChemEd DL is Lynn Diener. Lynn received her PhD in Molecular and Environmental Toxicology from the UW–Madison in 2005, and she is currently working as an Outreach Specialist with us. Lynn developed and led both of the Web seminars described earlier and is currently teaching an online workshop using the Moodle course management system on how to use the JCE Digital Library.

We are pleased that after six semesters as an undergraduate assistant, David Pieper joined the full-time ChemEd Digital Library staff. David graduated from UW with a degree in psychology earlier this year. He continues to work on various programming and web development projects.

This year Dolores Sirek joined the Chemical Education Digital Library staff as a Web designer. She has twelve years experience, seven of which have been with the University of Wisconsin. She has a Master of Science in Education from the University of Wisconsin–Madison and recently worked at Memorial Library on another digital-library grant funded by the U.S. Department of Education.

Say Hello! at Meetings

You are always welcome at the booths that JCE sponsors at national ACS meetings, Biennial Conferences on Chemical Education, ChemEd conferences, MACTLAC conferences, UW–System Chemistry Faculty meetings, and NSDL-related outreach projects. Please stop by to say hello, and catch us up on your recent accomplishments.
Institute for Chemical Education

Nanoscale Science and Engineering Center Outreach

The Institute for Chemical Education (ICE), led by Director John Moore and Outreach Coordinator Andrew Greenberg continued its role organizing the education and outreach activities of the Nanoscale Science and Engineering Center (NSEC). The NSEC, in its third year of a five-year $13 million grant, is comprised of four interdisciplinary research thrusts and the education and outreach group that explore complementary concepts around the central theme of self-assembly at the nanoscale. The NSEC education and outreach program aims to cultivate the next generation of nanoscale science and engineering experts, building on UW’s vast experience in science education and infrastructure provided by ICE. Chemistry graduate students and staff guide all the NSEC education outreach programs.

SCI ENCountErs

NSEC and the two Boys and Girls Clubs of Dane County continued their collaborative program, SCI ENCountErs. Ken Robertson led undergraduate volunteers and continued to make science fun and exciting for the boys and girls. Students explored the electromagnetic spectrum when they made their own spectroscopes out of pizza boxes. Other activities involved environmental clean up, the joy of bubbles, and writing with light on sun-print paper.

Research Experience for Undergraduates in Nanotechnology

As part of the NSEC grant, ICE organized the Research Experience for Undergraduates (REU) in Nanotechnology program with the goal of providing undergraduates from schools throughout the United States and Puerto Rico with a summer research opportunity within NSEC research laboratories. As part of the REU in Nanotechnology program eight REU students resided in the Chemistry Department in the labs of Mahesh Mahanthappa, Sam Gellman, Bob Hamers, Helen Blackwell, Song Jin, Padma Gopalan and David Lynn.

Research Experience for Teachers

During the summer of 2007 ICE and the NSEC hosted a Research Experience for Teachers program for three teachers, two from Wisconsin and one from Massachusetts. The three teachers, Jeanne Nye, a 7th grade teacher at Lake Mills Middle School, Suzanne Folberg, a 7th grade teacher at O’Keefe Middle School in Madison, and Maynard Morin, a chemistry teacher at Hingham High School in Hingham, MA. Jeanne, Suzanne, and Maynard worked with NSEC education and outreach staff and graduate students to produce nanoscience curriculum units that each will use in their classrooms during the 2007–2008 school year.

Nanoscience Teacher Workshops

Summer 2007 marked the return of ICE teacher workshops. On behalf of the NSEC, 2006 RET Jeanine Gelhaus and Andrew Greenberg taught two one week teacher workshops on the integration of nanoscience across the middle school curriculum. The ICE workshops were presented at the NSEC museum partner The Discovery Center Museum in Rockford, IL and at the Cray Academy in Eau Claire. The two workshops drew over 20 middle and high school teachers from Wisconsin and Northern Illinois. The workshops highlighted curricula developed by our 2006 RET teachers and NSEC education and outreach staff.

Nanoscience for Teachers: An Online Professional Development Course

Graduate student Janice Hall Tomasik has designed, evaluated, and also taught an online course for teachers about nanoscience. Geared towards high school or middle school science teachers, the online course encourages participants to incorporate nanoscience into their curriculum. The course covers nine topics about nanoscience, ranging from the synthesis and manipulation of nanomaterials, to societal implications and environmental impacts of nanotechnology. There have been three offerings of the course during the summer 2006, spring 2007, and summer 2007 semesters. To date, 30 teachers from Wisconsin, Illinois, Florida, Texas, Vermont, Massachusetts, Washington, and New York have participated to learn about nanoscience and how to include it in their classrooms. During the course, teachers chatted online each week with guest nanoscientists from the NSEC, including chemistry faculty Samuel H. Gellman, Padma Gopalan, Robert Hamers, Song Jin, and Mahesh Mahanthappa. As a final project, educators developed nanoscience teaching modules to take back to their classrooms.

UW–Madison undergraduate Liz Vazquez teaches a student at the Boys and Girls Club
**Tactile Models of Nanoscale Surfaces**

The NSEC education and outreach group, working with the University of Wisconsin–Madison Bio New Media Center, built the first macroscale models of nanoscale surfaces from data collected at the nanoscale. **Andrew Greenberg** and **Mohammed Farhoud** converted SEM images into 3-D formats that were printed using rapid prototyping printers. The models were designed to allow blind and visually impaired students to tactilely interpret images of nanoscale surfaces taken by scanning electron microscopes and atomic force microscopes. The first tactile model built was a model of a 15 mm nanobucky made completely of carbon nanofibers. The original nanobucky was produced by members of the Hamers lab (see last year’s *Badger Chemist*).

**Chem Camp**

The summer of 2007 saw nearly two hundred 5–8th graders participating in half-day, week long chemistry camps. Three camps were offered: **Fun with Chemistry**, **Fun with Forensic Chemistry**, and **Fun with Chemistry Inventions**. Professionals from the Madison community brought a wealth of real-world knowledge to the campers as guest lecturers. Speakers included a UW Police Detective, professors from the UW Pathology and Laboratory Medicine department and a chemist from Spectrum Brands Inc.

Twelve undergraduates led groups of 3–5 campers each week. Some students had such a great time during the **Fun with Chemistry** camp they returned for the next two camps. During **Fun with Forensic Chemistry** campers participated in a “drug bust,” uncovered a forged piece of art and learned about finger print analysis. Fun with **Chemistry Inventions** culminated with the student groups presenting their own inventions they developed during the week.

The camps were a great success and couldn’t have been so without the help of staff members **Cheryl Hansen**, **Tom Ladell**, **Jim Maynard**, and **Jenny Powell**.

**Students Participating in Chemical Education (SPICE)**

SPICE is a volunteer science outreach organization of graduate and undergradu-ate members who perform chemistry demonstrations or lead hands-on activities in the community. During the 2006–2007 academic year SPICE members participated in twenty-five events serving over two thousand pre–K children through adults. For example, SPICE members represented the bulk of volunteers who developed and facilitated the National Chemistry Week activities sponsored by the local Wisconsin section of the American Chemical Society, they led experiments with parents and children during several Family Science Night programs at elementary schools, and they participated in UW–Madison’s Science Expeditions Whys and Wows event.

**National Chemistry Week**

Under the leadership of **Diane Nutbrown**, the Wisconsin local section of the American Chemical Society (ACS) celebrated 2006 National Chemistry Week with several interactive events highlighting the theme “Your Home: It’s All Built on Chemistry.”

The celebration began with a haunted house held at the Alpha Chi Sigma House, which is more than a century old. Kids and parents were guided through a basement with characters lurking in the shadows, led upstairs to bedrooms transformed into spaces charged with electricity and papered with polymers, and finally funneled through great rooms on the first floor haunted by ghosts that promised a surprise ending.

Volunteers also visited the 12 seventh-grade science classes at Cherokee and O’Keeffe middle schools. Because polymers make up 80 percent of building materials for homes, experiments focused on the chemistry of polymers and complemented the content students were learning.

This continued the relationship established in 2004 with those seventh-grade classrooms, which are piloting a new science curriculum that includes chemistry. This program was such a success that the local section won a 2006 ChemLuminary award for an outstanding event for a specific audience at the recent national ACS meeting in Boston, MA.
“60 Years of Physical Organic Chemistry” Symposium in Boston

A group of Howard Zimmerman’s former research students – Laren Tolbert (PhD ’75), David Crumrine (PhD ’71) from Loyola University and Steven Fleming (PhD ’84) from Brigham Young University organized a one-day symposium at the Boston ACS Meeting in August in honor of Zimmerman. Additionally there was a very pleasant banquet with the speakers, former students, and friends attending. The symposium was titled “60 Years of Physical Organic Chemistry.” The speakers at the symposium were:

Marye Anne Fox (Professor and Chancellor, University of California San Diego)
Rich Givens (PhD ’66, Professor, University of Kansas)
Masahiro Irie (Rikkyo University)
Hiizu Iwamura (PD ’67–’69, Professor, Tokyo)
Andrei Kutateladze (Scientist ’92–’95, Professor, University of Denver)
Fred Lewis (Professor, Northwestern)
Josef Michl (Professor, Colorado)
Al Padwa (PD ’62–’63, Professor, Emory University)
Jim Pincock (Professor, Dalhousie University, Halifax, Nova Scotia)
Dave Schuster (PD ’60–’61, Professor, NYU)
Laren Tolbert (Professor, Georgia Tech)
Howard Zimmerman (Professor, Wisconsin)

All but Masahiro Irie, Fred Lewis, and Josef Michl are former research students. Marye Anne Fox feels that she is a member of the Z-group as an academic “grand-daughter”.

Poster presenters also at the banquet included: Richard Johnson (PD), Diego Armesto, John Penn (PhD ’81), Dave Crumrine, Rich Bunce (PhD ’81), Pengfei Wang (PhD ’02, Asst. Professor, University of Alabama), and Steve Fleming.

Speaker and poster guests: Peggy Zimmerman, Hiizu’s wife Michiko Iwamura (PD Nelsen), Alex Pincock, Barbara Tolbert, and Gloria Penn.

Also Former Z students and friends: Igor Alabugin (PD ’96–’00, Assoc. Professor, Florida State), Tom Welter (PhD ’77, Kodak), Evgueni Nesterov (PD ’98–’02, Asst. Professor, LSU), Zhaoning Zhu (PhD ’94), Josh Schantl (PD, University of Innsbruck), Gil Jones (PhD ’70, Boston University), leva Reich, Steve Zimmerman, and John and Betty Moore.
The Chemistry Department held a reception at the Spring 2007 ACS National Meeting in Chicago. About 120 alumni, friends, current faculty and staff, undergraduate students and graduate students attended the event. Special recognition went to Professors Sam Gellman and Laura Kiessling, who were receiving ACS awards at the meeting.

Look for us again on the program of the 2008 Spring National Meeting in New Orleans.
**ISCC-8**

8th International Symposium on Carbanion Chemistry

*Professor Hans Reich* organized and hosted the symposium on carbanion chemistry in June of 2007. Attended by over 140 people from around the globe, the symposium consisted of plenary lectures, invited lectures, oral presentations and posters. All aspects of carbanion chemistry (synthetic, mechanistic, structural and theoretical) as well as the chemistry of alkali and alkalai earth metals were covered. Conference activities were held at the Chemistry building, the Pyle Center, Monona Terrace Convention Center and a picnic site on campus. This variety of sites offered conference participants a chance to enjoy the city of Madison and particularly the UW–Madison campus.

Conference organizers from the UW–Madison included *Hans Reich* (chair), *Leva Reich*, *Kevin Jantzi* (PhD ’04, Reich), *Kris Kolonko* and *Kristin Plessel*.

In addition to the scientific presentations, organized events for the five-day conference included a mixer at the Pyle Center, a conference banquet, and a picnic. The conference banquet, held at the Monona Terrace, was a highlight of the social activities for the conference.

Conference organizers wish to thank the sponsors, which included the ACS (Wisconsin Section), the UW–Madison Department of Chemistry, Pfizer Corporation, The Department of Organic & Bimolecular Chemistry, Sigma-Aldrich, Merck, ACS Publications, Boehringer Ingelheim, 3M and ACS/PRF.

Tripp Lakeshore picnic area was the site of the conference picnic . . . a casual event of socializing enjoyed by all!

*Pictured: Michael J. Krische (University of Texas–Austin) and Leva Reich (UW–Madison Chemistry Department) at the conference banquet.*

*Gary Molander (PD ’80–’81, Trost, now University of Pennsylvania) and Professor Hans Reich at the conference mixer held at the Pyle Center.*

*(left to right): Kris Kolonko, Kristin Plessel, Professor Hans Reich, Amanda Jones (PhD ’07, Reich), Margaret Biddle (PhD ’05, Reich) and Kevin Jantzi (PhD ’04, Reich).*

*(left to right)*

Stuart Staley (PD ’63–’64, Zimmerman, now Carnegie Mellon University), Göran Hilmersson (Göteborg University), Gideon Frankel (Ohio State University) & Dan Johnels (Umeå University)
Wisconsin Initiative for Science Literacy

If giggles, shrieks and sincere applause are valid measures, the Wisconsin Initiative for Science Literacy (WISL) programs and events, directed by Chemistry Professor Bassam Shakhashiri, succeeded in raising the level of science literacy among the young and not-so-young alike.

**SCIENCE IS FUN STUDENT PUBLIC PRESENTATIONS**

The largest group so far, 27 undergraduate students, participated in the Science is Fun demonstration corps during the 2006–2007 school year. The corps consisted of 12 men and 15 women, most of them from Wisconsin. The students earn one credit in Chemistry 299 or 699, directed or independent study in Professor Shakhashiri’s group. During the school year, the corps participated in 26 events including appearances at schools, community events and University events including Kids Expo, Science Expeditions, Engineering Expo, and College Days.

Science is Fun will miss Mike Boll, (BS ’04, MA ’07) a Graduate Project Assistant, who has assisted Professor Shakhashiri under the watchful eye of Amadeo Avogadro, Dr. Linda Zelewski demonstrates some of the laws of gasses. Here, she partially submerges the inflated balloon in liquid nitrogen. The cooled gas contracts, deflating the balloon. Upon exposure to room air, the gas absorbs heat and the balloon regains its full inflation.

and Dr. Rodney Schreiner (MS ’73, PhD ’81, Shakhashiri) in leading the demonstration corps for two years along with Senior Outreach Specialist Dr. Linda Zelewski (PhD ’99). Mike, a native of Port Washington who has also been a teaching assistant for Chemistry 103 and 104, joined the Science is Fun corps four years ago. Mike has earned a Masters degree in Chemistry under the supervision of Professor Shakhashiri and a teaching certificate from the School of Education, and this fall began a career as a chemistry teacher at Niles North High School in Skokie, Illinois.

Mike first took Chemistry 699 because he joined Professor Shakhashiri’s research group and knew he wanted to go into education. Mike had been in chemical engineering, but decided that he preferred teaching. “It’s very fulfilling,” he says. “It’s what I want to do. I enjoy every day and it’s nice to find a job that doesn’t seem like work.” Mike says his presentations have improved a lot. “I wasn’t exactly nervous at the start,” he says, “but now I feel much more comfortable before an audience and with the demonstrations.” Mike has done dozens of demonstrations and says that after doing a show for 400 elementary students, dealing with 20 to 30 high school students will be easy. As a demonstrator, he likes elementary student audiences the best because they are uninhibited and show so much excitement, while middle school students are often inhibited by the need to appear “cool.” Mike says, “High school audiences are totally different because you can really engage in content and get them thinking about much deeper aspects of the science.”

Mike’s advice for his successor as lead assistant in the Science is Fun student presentation corps: “Stay organized and keep track of what needs to be done. It’s difficult not to over-commit yourself.” Staying organized includes keeping track of student schedules and who is doing each demonstration, tailoring each program to the audience and the available demonstrators, working on a theme and publicity, making sure of finding the location, and above all, making sure everything is safely packed for

Exploding hydrogen filled balloons is a sure way to get an audience’s attention. Mike Boll set ’em off at Science Expeditions and Engineering Expo. (Balloons filled with a mixture of hydrogen and oxygen, which give an even bigger bang, are reserved for special occasions.)
going on location. Demonstrators also need to be able to adjust and improvise when the unexpected happens. For example, Mike and Professor Shakhashiri were in Green Bay when they discovered that the valve on their propane tank was stuck, and they could not use a propane torch to ignite their hydrogen and helium-filled balloons. So they taped a candle to a broom handle.

Like many science graduates, Mike was inspired by a high school teacher. Mike says when he was a sophomore, he had a very dynamic chemistry teacher who gave students a lot of freedom to experiment and follow their own course. While in high school, Mike tried most of the demonstrations in Professor Shakhashiri’s four volume series, *Chemical Demonstrations: A Handbook for Teachers of Chemistry.* Mike hopes to inspire his students to do the same.

Another Science is Fun demonstrator, **Tyler Schaaf (BS ‘07),** graduated with a degree from the College of Agriculture and Life Sciences and has applied for admission to the School of Veterinary Medicine. Tyler, from Salem, Wisconsin, enjoys making Science is Fun presentations. “It’s always great to see the reaction kids have to learning something new,” she says, “you can see the reaction on their faces.” Tyler likes being on stage and says the demonstrations have improved her speaking skills, eliminating vices like fidgeting. “Anyone in the professional world needs to be able to speak before audiences,” she says. Tyler says some kids are afraid of chemistry because it sounds tough, but they get excited when it’s explained on their level. They may even think, “I can do whatever I want to,” she adds.

Becoming a vet has been Tyler’s dream since she was three. She likes animals, obviously, but also loves working with people. It’s also problem solving, she says. “The patient can’t tell you where it hurts, so it’s like a detective story, with the diagnosis based on education and research.” Tyler would like to go into a mixed practice. She loves horses, and most of her training has been with large animals, but she enjoys working with small animals too.

Another graduating senior, **Rachel Butorac (BA ’07),** is going on to graduate school in organic chemistry at the University of Texas. Rachel enjoyed her two years with the demonstration corps. “I joined because I thought it would be fun to do demonstrations and help people learn,” she says, “and now I’m used to being in front of people.” Rachel was also inspired by a high school chemistry teacher, at Fort Atkinson High School. Rachel says getting women interested in science is not an issue any more. Undergraduate enrollment in chemistry is now more than half women and the demonstration corps is more than half female. Rachel says she was never discouraged from going into chemistry. She has non-science friends and says it’s never been an issue with them. Rachel says it’s good to have friends in other fields because exchanges and learning are going on all the time.

**SCIENCE, THE ARTS AND HUMANITIES**

Common to the sciences, the arts, and the humanities is the creative urge that drives them all. All share the human inclination to explore the unfamiliar, to investigate the unseen, to discover the unknown, and to express the unusual. Although the landscapes explored in the sciences, the arts, and the humanities may differ in detail, they possess common features, as well. In these common features is where culture lies.

Among the pursuits of the Wisconsin Initiative for Science Literacy is the exploration of these common features of culture. WISL helps people explore, discuss, and cultivate the intellectual and emotional links between science, the arts, and the humanities. We focus on the relationships, similarities, and differences in inquiry, creativity, and personal expression among scientists, artists, and humanists. A specific goal is to give musicians, artists, writers, and performers—present and future—an appreciation of science and enable them to see and understand the connections between science and the arts. To these ends, WISL has collaborated with several individuals and groups in the arts and humanities to explore these connections.

WISL has invited the Center for the Humanities to join in sponsoring visits to Madison by a number of writers who have successfully connected science, technology, and popular literature. Among these writers have been **Dava Sobel,** author of “Longitude,” “Galileo’s Daughter,” and “The Planets,” and **Harold McGee,** author of “On Food and Cooking” and “The Curious Cook.” During their visits, these writers participated in public presentations, discussions with campus groups, and appearances on public radio. Needless to say, their presentations, discussions, and appearances have been tremendously popular.
Connections between science and music have been explored through a variety of collaborations with faculty and students in the School of Music. Marc Fink, Associate Director of the School of Music and Professor of Oboe, who is also a Faculty Fellow with WISL, has collaborated in several events featuring the science and art of sound. These events have included public presentations to various audiences and hands-on sessions for young people and their parents. Catherine Kautsky, chair of the Piano Department in the School of Music, along with several of her students, has participated in several events in which historical and geographical connections between scientific discoveries and musical compositions have been presented. All of these collaborations have been enthusiastically received by audiences and by the presenters, too.

In recent years, science has been featured in a number of dramatic creations, such as “Copenhagen” by Michael Frayn and “Oxygen” by Carl Djerassi (PhD ’45, Wilds) and Roald Hoffmann. Both of these plays have been produced in Madison, the latter by University Theater, under the direction of Professor Norma Saldívar, who is also a WISL Faculty Fellow. (A DVD of this production is available from Educational Innovations, www.teachersource.com) Of course, both Djerassi and Hoffmann are renowned chemists. The connections between chemistry and theater have been maintained and developed. Currently three of Prof. Saldívar’s graduate students in theater are collaborating with the student group that offers public “Science Is Fun” presentations. The theater students are coaching the undergraduate science students in techniques of effective communication, and in the meantime are themselves learning quite a bit of science.

One of the theater students, Talish Jude Barrow, enjoyed working with the chemistry students and found them very receptive. “I saw a definite improvement in the presentations from the beginning of the semester to the end,” he reports. “I was pleasantly surprised at the aptitude a number of these students had for performing. With a little technique and encouragement, it was gratifying to hear full resonant voices from the majority of the class. It was also great to see how creative some of the students were at inventing story lines or connecting comments to put the experiments in context.”

Talis also noted that the material is so good (the experiments themselves) that it’s fun to present. He says, “I learned a good deal about science from the experience, which was fun. Another thing I was reminded of in working with the class was how, for some people, it can be very liberating to have a character to inhabit as opposed to just being yourself in front of a crowd. Even if that character is just a more outgoing version of oneself, it can help give you permission to be loud, friendly and expressive.” Talish concludes: “Overall I thought it was a fantastic experience and would welcome the opportunity to work with these classes in the future.”

For the final session, the theater students presented their own version of the “genie in a bottle” demonstration. In the demonstration, a catalyst (powdered manganese dioxide) is added to a small amount of a 30 per cent solution of hydrogen peroxide in a plastic soda bottle. The exothermic decomposition reaction of H2O2 causes a tall plume of condensing water vapor to rise from the bottle. (It also causes the bottle to shrink, which is what happens with plastic shrink wrap when heated.) In the theater students’ version, Claire A. Haden was a housewife having trouble with her genie bottle. Steve Wojtas was a genie bottle repairman and Talish was the genie. The theater students conveyed all the science, explaining that it was not magic, in a captivating presentation. (We should add that this is not an experiment to do at home. A 30 per cent solution of hydrogen peroxide is a highly reactive, hazardous material and not readily available. The hydrogen peroxide available in drugstores is only a 3 per cent solution and won’t produce the genie in a bottle.)

One Science Is Fun demonstration at Madison’s Villager Mall had a special element—science combined with music. The Villager Mall has an education center open to the public, operated by the Astronomy Department’s Space Astronomy Laboratory, located on South Park Street in Madison. Science demonstrations at the Villager Mall alternated with the performance of music by UW–Madison piano students, music composed by contemporaries of the discoverers of the scientific principles being demonstrated. The program was designed by Dr. Rodney Schreiner and Professor Kautsky. Rodney, who has studied and practiced piano since childhood, says the idea was to inspire people to see that areas of human endeavor are not completely separate. Both are human activities that affect everyone, whether they realize it or not. Rodney says WISL tries to bring faculty and students together who might not otherwise meet because their studies are too compartmentalized.

The program paired contemporary scientists and composers. For example, Mozart’s variations on the theme of “Twinkle, Twinkle Little Star” (a folk tune) were followed by a demonstration involving oxygen, which was named by a contemporary of
Mozart, Antoine Lavoisier, who is generally regarded as the father of modern chemistry. Rodney says Lavoisier may have attended a performance of Mozart's in Paris, though there is no evidence that they met.

Rodney also notes that technology has had a great effect on music. The development of better musical instruments during the 1800s, such as brass instruments with valves, allowed composers to do new things. Rodney says Richard Wagner was one of the most influential composers because he made innovative use of new technology. Though Wagner has many detractors, Rodney says 20th century music sounds a lot more like Wagner than Beethoven.

Science is Fun demonstrator Amanda Turek (BS '09) was especially qualified for the presentation. Amanda, a sophomore chemistry major from Menominee Falls, has been studying piano since she was five and considered taking a double major in chemistry and music. In addition to her chemical demonstrations, Amanda played music by Fanny Mendelssohn, sister of Felix Mendelssohn.

Amanda says she has always wanted to be a chemist because she likes mixing things together to see what will result. "I've always been curious to see what would happen," she says, "and I began by helping my mom with baking. I started with things like water and food coloring, and broadened my horizons."

Amanda says music and science are similar. She says music is very scientific, involving patterns and rules, while chemistry is very creative, requiring imagination to come up with new ideas for research. Amanda rejects the right brain/left brain dichotomy that seems to separate science and the arts. "Most people can do both," she says. Amanda also says both science and music require a lot of hard work, and both show the value of putting in time, because the result is so rewarding. She adds that music performance has helped her to do chemical demonstrations by making her comfortable appearing before an audience. "There's no need for stage fright," she says, "unless you are unprepared."

Amanda believes that everyone can find something that appeals to them in science, and she urges students to try different fields until they find what they like. Amanda didn't see a career in general chemistry but kept going until she found exactly what she wanted to do, organic chemistry. "I like how it makes you think," she says, "always looking to create something, and the challenge is to find out how to do it." Amanda works with a research group, which she finds very rewarding. "It's really great to do real research as an undergraduate," she says.

Professor Kautsky says, "It was interesting to see demonstrations of the simultaneous development of music and chemistry by adventurers in both fields." She says it's good for children to see students who are so competent in both fields, and adds that the combination is not rare. Professor Kautsky has supervised several students who were double majors in piano and math or piano and chemistry and says they attract the same type of people. She notes that many physicians are also musicians and that several large cities have doctor's orchestras, in which all the players are physicians. Professor Kautsky also says music and math are closely related in that both fields require very orderly, disciplined thinking, even if they are doing different things. She adds that while music is very mathematical, math phobia does not seem to carry over to music. Rodney agrees that math and music go together. Rodney says, "In performance you can 'feel' the math through rhythm, and if you can't, you shouldn't be playing."

Another Science is Fun demonstrator who lives in two worlds is violinist Edith Hines, a graduate student in the School of Music (DMA '09, Music History). Both of Edith's parents are chemists, so she came to science naturally, involved in hands-on science demonstrations for much of her childhood. In addition, her mother showed Edith and her siblings videos of Professor Shakhashiri's Christmas Lectures. "I didn't know they happened at the U.W–Madison until I decided to come here," she says, "then mom told me I should look up (and eventually introduced me to) Professor Shakhashiri." Edith says doing the demonstrations is fun and the reactions of children in the audience are very rewarding. "I also realized the importance of practicing a demo before giving it," Edith continues. "You'd think I'd know that from being a performing musician, but I sometimes put too much faith in my ability to ad lib (as long as I basically knew the science). Another surprise was how much improvisation goes on. Professor Shakhashiri has a great ability to modify his presentation on the spur of the moment, and it always looks like he'd intended to do it that way from the beginning." As far as the relationship between the arts and science, Edith says music and science are "very closely related in that both are very mathemati-

The annual Christmas Lecture always includes a musical selection, and the 37th Christmas Lecture was no exception. Here, Professor Shakhashiri performs a demonstration with the help of Akornefa Akyea, a junior at Verona High School, who went on to play a selection on her flute. Akornefa won the 2006 Bolz Young Artist Competition and has played solo flute with the Madison Symphony Orchestra.
of science and arts, Edith says, “Both are very analytical. In science, one analyzes what is happening, while in the arts one analyzes what is being communicated and how that is being done. Of course, Science is Fun already combines the two in that it is a type of ‘performed science.’” Edith also says science and the arts complement each other as theory and practice. “Science/math provide a theoretical explanation for the practical activity of art,” she says. “In fact, music used to be considered more science than art, and even now there’s a degree of tension between music theory and performance. Professor Shakhashiri constantly emphasizes the application of his demos to everyday experience, and music is a concrete example that can be observed during a show.”

Most of the Science is Fun demonstrations include an element of music, especially the Christmas Lecture, which always includes musicians to demonstrate not only the physics of their instruments, but the beauty of their playing.

In another synthesis of science and the humanities, WISL continued its practice of bringing eminent scientists to Madison by sponsoring two public lectures by Francisco Ayala, who holds chairs in science and the humanities. Professor Ayala is Donald Bren Professor of Biological Sciences and Professor of Philosophy, University of California, Irvine. Professor Ayala, whose specialty is evolutionary genetics, spoke on “Darwin’s Most Significant Discovery: Design Without Designer” and “From Biology to Ethics: The Biological Roots of Morality.” The two talks were co-sponsored by the Center for the Humanities and the College of Engineering.

**CONVERSATIONS IN SCIENCE FOR TEACHERS**

The Conversations in Science series, in its 8th year in 2007–2008, is a monthly two-hour session with top University researchers that is open to all Dane County teachers. Dr. Lisa Wachtel, Executive Director, Teaching and Learning, Madison Metropolitan School District, says, “Teachers feel this is the best kind of in-service experience offered in many years. The interaction of teachers and researchers is rare and reduces teacher’s feelings of isolation.” One teacher remarked, “It’s a great pleasure to have the professional side of my brain stimulated and to rub shoulders with people at the next level. I left each session feeling good and had my sense of purpose as a science teacher renewed.” Teachers can earn continuing education credit through Conversations in Science. Another purpose is to encourage researchers to communicate with a larger audience. One researcher described the experience saying, “I thoroughly enjoyed interacting with the teachers. Their questions were very insightful.” Conversations is co-sponsored by the Madison Metropolitan School District, which handles publicity and enrollment, and Edgewood College, which provides an excellent lecture hall in the Sonderegger Science Center on the Edgewood campus. Professor Shakhashiri arranges for the speakers and provides the food. Sessions begin at 4PM and teachers are grateful to get a snack after a long day of teaching.

During the 2006–2007 school year, presentations included:

- **Ron Seely**, science reporter for the Wisconsin State Journal and Lecturer, Life Sciences Communication, “Reporting on Science and Technology”
- **Professor Richard Weindruch**, School of Medicine, “Calories, Cancer and Aging”
- **Professor David Bernhardt**, Sports Medicine, “Performance Enhancement: Beyond the Work, Sweat and Tears”
- **Professor James Dumecic**, Chemical and Biochemical Engineering, “Making Hydrogen, Liquid Fuels and Plastics from Biomass-derived Carbohydrates”
- **Professor Susan Goelzer**, Anesthesiology and Internal Medicine, “Transforming Health Care: A Vision for the Future”

**SCIENCE IN THE CITY: PEOPLE PROGRAMS**

WISL again provided summer chemical workshops for inner city students from Milwaukee, Kenosha, Racine and other school systems as part of the PEOPLE Program (Precollege Enrichment Opportunity Program for Learning Excellence). Dr. Rodney Schreiner (MS ’73, PhD ’81) developed the workshop curriculum and was assisted by Graduate Project Assistant Mike Boll (BS ’04, MS ’07) and Science is Fun student instructors. Junior high students in the PEOPLE Program attend three hours of chemistry laboratory instruction every morning for three weeks and high school students attend two hours a day for one week. In addition to teaching content, the program helps students develop the habits and discipline to become good college students.

**SCIENCE IN THE CAPITOL**

The Science is Fun student demonstrators again took science to the capitol, with a hands-on demonstration table in the rotunda during a noon hour when the legislature was in session. The surest draw for legislators was a constituent. A majority of the student demonstrators are from Wisconsin, and the hometown legislators of participating students were notified. All stopped by the table. With the University budget under intense scrutiny in the legislature, “showing the flag” in the form of a popular program involving undergraduates is an exercise in good governmental relations as well as a promotion of science literacy.
Chuck and Martha Casey visited Australia in July and met up with Ian and Carol Dance in Sydney. Chuck and Ian both joined the Chemistry Department in 1968 as Assistant Professors. Ian moved to University of New South Wales in 1974 and recently achieved emeritus status. The photo of Ian and Carol was taken on a tour of Sydney. Chuck presented the Dwyer Lecture at the University of New South Wales and participated in the 4th Heron Island Conference “Synthesis and Mechanism: Reactive Intermediates and Unusual Molecules” on the Great Barrier Reef. Chuck made his first and probably only scuba dive there.

Chuck chaired a National Research Council Panel to Benchmark the Research Competitiveness of the U.S. in Chemistry. The panel was charged with addressing three specific questions: (1) What is the current position of U.S. chemistry research relative to that of other regions or countries? (2) What key factors influence U.S. performance in chemistry? (3) On the basis of current trends in the United States and abroad, what will be the relative U.S. position in the near term and in the longer term?

The panel’s report “The Future of U.S. Chemistry Research: Benchmarks and Challenges” was released in March 2007. A Report in Brief and an Executive Summary can be downloaded free from National Academies Press website at http://www.nap.edu/catalog.php?record_id=11866. The full report can be read on this website (individual pages may be printed free) and copies can also be purchased.

The report concluded that today, chemistry research in the United States is stronger than in any other single country, but competition from Europe and Asia is rapidly increasing. In 2003, the United States published about 19 percent of the world’s chemistry papers, down from 23 percent in 1988. While U.S. chemists have been publishing at a steady rate of about 15,000 chemistry papers per year, chemists from other nations are increasing their rate of publication. U.S. chemists lead in the quality of their publications. U.S. chemistry citations account for 28 percent of total citations compared to the next two ranked countries of Japan and Germany, both with 9 percent. More importantly, they contributed to 50 percent of the 100 most frequently cited chemistry papers, while Western Europe contributed 41 percent.

The panel projected that chemistry research in the United States will remain stronger in the next decade than in any other single country, but competition is increasing. Because of the advance of chemistry in other nations, competition is increasing and the lead of U.S. chemistry will shrink.

The panel had two major concerns that will impact the ability of the U.S. to maintain its leadership in innovation. First, the sustainability of the supply of U.S. chemists was seen to be in jeopardy. For the past 15 years the number of Ph.D.s in chemistry granted at U.S. universities has been relatively steady at around 2000 per year. However, this level has been maintained by increasing reliance on international students (from about 25% in 1985 to about 40% in 2005). Unless we are able to persuade more U.S. students to pursue careers in science, it is likely that the number of U.S. citizens receiving chemistry Ph.D.s will continue to decrease. At the same time, U.S. chemistry may find it increasingly difficult to attract and retain outstanding international graduate students and postdoctoral research associates as chemistry and other opportunities in other nations improve.

Second, U.S. funding of chemistry research and infrastructure was projected to remain under stress. Support was forecast to continue to barely keep up with inflation and to be concentrated in emerging and interdisciplinary areas. Core research areas of chemistry, which underlie advances in the emerging areas of science, were viewed as being stretched thin.
Fleming Crim gave the Musselman Visiting Scientists Lectures at Gettysburg College in Pennsylvania, and was a lecturer at the Molecular Physics Colloquium on high-resolution spectroscopy in Dijon, France. In addition to his UW-Madison duties, he will serve as the Co-Chair of the Board on Chemical Sciences and Technology at the National Academies.

Andrew Greenberg, a chemistry staff member, was recently featured in *Newsweek* for his work developing tools to help vision-impaired students learn about science. This project, funded in part by the UW–Madison Nanoscale Science and Engineering Center, involves using rapid prototyping methods to create three-dimensional tactile models of nanoscale structures and surfaces. The article is in the June 11, 2007 edition of the magazine (page 14).

Bob McMahon presented an invited lecture at the Reaction Mechanisms Conference (College Park, MD). Dan Singleton (PD, Trost) and Rustem Ismagilov (PhD ’98, Nelsen) also spoke at the meeting. Rustem was the inaugural recipient of the Journal of Physical Organic Chemistry Award for Early Excellence in the Field of Physical Organic Chemistry. Bob also presented invited lectures at the First Workshop on Titan – Observations, Experiments, Computations, and Modeling (Honolulu, HI), the Enrico Fermi Institute Mini-Symposium on Astrochemistry (Chicago, IL), and the International Symposium on Reactive Intermediates and Interesting Molecules (Heron Island, Australia). Other speakers in Australia included Chuck Casey, Tim Clark (organic visitor), and Armin de Meijere (organic visitor). Bob continues as an Associate Editor for the *Journal of Organic Chemistry*, and was recently elected to a three-year term as a member of the Executive Committee of the ACS Division of Organic Chemistry.

In early June, Tracy Drier attended the 1st European Glassblowers Symposium in Veldhoven, Netherlands. Over 490 participants from more than 20 countries traveled to Veldhoven to participate.

For centuries, glassblowers were known for being highly secretive, as a way of protecting techniques, trade secrets and new processes or formulas. Therefore, it was appropriate that the theme of the symposium was “Europe United in Glass”; acknowledging the benefits of cooperation and common interests among glassblowers. The intention was to provide a forum to allow scientific, neon and artistic glassblowers from Europe and other countries to share their glassblowing experience and techniques with one another. This was done through lectures, exhibitions, workshops and factory visits. This new trend toward openness and sharing is a wonderful development for everyone.

The symposium was organized by the Dutch, Belgian, German and British scientific glassblowing societies. Tracy said, “My participation was one of the highlights of my glassblowing career.” Renewing established friendships, putting names to faces from the various glass web forums, and meeting new people in the context of glassblowing was unforgettable.

Tracy also attended this year’s American Scientific Glassblowers Symposium that was held in Portsmouth, Virginia. Tracy was invited to judge this year’s paper presentations. He also presented a poster on the European symposium. Tracy was presented with the 2007 Achievement Award at the annual awards banquet, presented by the Midwest Section of the American Scientific Glassblowers Society.

In other news from the Glass Shop, in the spirit of sharing knowledge and experience, Jason Craig, a glassblowing student from the scientific glassblowing program at Salem Community College spent a week in the glass shop with Tracy, in July. Jason spent time learning and practicing various lathe techniques throughout the week. He came away with a number of things to practice throughout his final year of school.

For the first time, the glass shop offered a full-semester class in scientific glassblowing, designed for graduate students in chemistry. The class met once a week for 3 hours and focused on the skills required to build small apparatus or make your own repairs.

Tracy hosted a class from the UW Stevens Point sculpture program last autumn, demonstrating various glassblowing techniques and answering questions. This last spring he was invited to participate in the Stevens Point College of Fine Arts and Communication Interarts festival. He also had a month-long gallery show with 4 other regional glass workers. In September, he was in New York, at the Corning Museum of Glass, teaching a weeklong class on flame working, with his brother Tim.
Lloyd Smith went salmon fishing for the first time off the coast of Alaska, and caught his limit in King Salmon. Here he is with a 23 lb specimen.

Cathy Middlecamp, Chemistry 108 lecturer and Director of the Chemistry Learning Center, was appointed as Editor-in-Chief for the seventh edition of Chemistry in Context (CiC). Published by the Education Division of the American Chemical Society, the book is widely used in both Chemistry and non-Chemistry fields.

The Reich group organized the 8th International Conference on Carbanion Chemistry (ISCC–8) in Madison in June 2007. (See story on page 22)

Bassam Z. Shakkashiri was recognized by the National Science Board with its 2007 Public Service Award at a black tie dinner held on May 14 at the ornate diplomatic functions rooms atop the US State Department in Washington, D.C. Bassam was cited for his extraordinary contributions to increase public understanding of science and for his “fearlessness” in reaching audiences, large and small, with his messages of science literacy, and the connections between art and science. The National Science Board is an independent 24-member body of policy advisors to the President and Congress on matters of science and engineering research and education, and is the oversight body for NSF. The Board initiated the Public Service Award in 1996 and previous recipients include: Alan Alda, host of PBS’s Scientific American Frontiers; Craig R. Barrett, Chairman of the Board, Intel Corporation; Ira Flatow, host and executive producer of NPR’s “Talk of the Nation: Science Friday”; author and neurologist Oliver Sacks; astronaut Kathryn D. Sullivan; biologist Stephen J. Gould; and author Dava Sobel.

Bassam served as NSF assistant director in the mid 1980s and was the architect for rebuilding education programs at NSF after many were greatly reduced in the early years of the Reagan Administration. NSF’s annual budget for science and engineering education programs dropped from $80 million in fiscal year 1980 to $23 million in 1983. Bassam arrived at NSF in 1984 and pressed successfully for rebuilding NSF’s K–12 and informal science education programs. In addition, he aggressively advocated a resurgence of NSF’s undergraduate education programs and an expansion of research career development programs for women and under represented groups. His strategic plan set the annual education budget on a trajectory of $600 million. By the time he left the agency in 1990, NSF’s budget for education and human resources had grown to more than $230 million and in 2007 exceeded $800 million.

Bassam finds it satisfying and rewarding to work with collaborators dedicated to the mission of the Wisconsin Initiative for Science Literacy (WISL). The hard and produc-
tive work of Rod Schreiner (MS '73, PhD '81), Patti Puccio, Linda Zelewski, John Powell, Laurens Andersen, and June Shakhashiri, along with staff, graduate and undergraduate students makes it all enjoyable and effective. Recent programs were conceived and offered in collaboration with the Center for the Humanities, music professor Marc Fink and theatre professor Norma Saldívar (both serving as WISL faculty fellows) and their students, community leaders in Dane County and throughout Wisconsin, and with leading scientists and policy makers from across the country. Local and national donors enable WISL to sustain its program offerings. Additional donations can help expand WISL's R&D work and also help reach new and larger audiences. We thank all donors and especially UW-Madison former students and alumni for their generosity in support WISL and promoting the Wisconsin Idea.

Since January of 2006 Bassam has given over 40 invited presentations to audiences in the US and abroad. These include science fairs, celebrations of National Chemistry Week, and meetings of ACS, the American Association for the Advancement of Science, the National Science Teachers Association, and IUPAC. One of the joys of professional travel is visiting with former students, alumni, and their families and friends. Each mentions fondly various recollections of UW-Madison.

At the 2006 Fall ACS meeting in San Francisco WISL organized and co-hosted a presidential symposium honoring Carl Djerassi (PhD '43) for his scientific and literary contributions. At the 2007 Fall ACS meeting in Boston WISL organized and co-hosted a presidential session to mark Roald Hoffmann's 70th birthday and his promotion to emeritus professor at Cornell. Both Djerassi and Hoffmann have been WISL visiting fellows and major collaborators in promoting science literacy. Commemorative booklets from each symposium are available free of charge upon request from WISL, but the supply is limited.

Bassam kept up his usual pace with local presentations at Hilldale Mall, Kids EXPO, Science Expeditions, Engineering EXPO, College for Kids, College Days, family science night, Science in the Capitol, Wisconsin schools, and many other locations. Bassam and Rodney Schreiner discussed and demonstrated the science of fireworks prior to the Wisconsin Chamber Orchestra “Concert in the Park” which was followed by a professional fireworks show.

On September 17, 2007 Bassam marked the 50th anniversary of his arrival in the United States from his native Lebanon by sharing a cake with the 350 students enrolled in his Chemistry 103 course. Parents and relatives of several students currently enrolled in this class took chemistry with Bassam in previous years—no grand kids of former students yet!

Bassam is in his 38th year as a UW faculty member and will present the 38th **ONCE UPON A CHRISTMAS CHEERY IN THE LAB OF SHAKHASHIRI** in early December. Check local PBS and cable station listings for time and date of telecast of this year's Christmas Lecture which follows the tradition of British scientist Michael Faraday who presented the Christmas Lecture 19 times beginning in 1827 at the Royal Institution in London.

The ACS presidential election in 2006 had an interesting Wisconsin connection. The slate of nominees for 2007 ACS president-elect was presented to the ACS Council in March of 2006 at the Atlanta national meeting and the council vote was:

- Bassam Shakhashiri, 280
- University of Tennessee Dean of Arts and Science Bruce Bursten, 206
- Inorganic Chemistry editor Richard Eisenberg, 195
- UCSB Dean of Engineering Matthew Tirrell, 128

The two candidates selected by the Council, Bassam and Bruce Bursten (PhD ’78, Fenske), were presented in the fall to the 158,000 general membership along with two petition candidates: Yorke E. Rhodes, New York University (retired), and James A. Walsh, John Carroll University (retired). Because no candidate received a simple majority of votes and in accordance with ACS bylaws, a runoff election between the two top vote getters was held. In the runoff, Bursten received 13,871 votes and Bassam received 12,179 votes. Bursten joins other Wisconsin alumni and faculty who have served as ACS president (Charles P. Casey in 2004, Warren D. Niederhauser (PhD ’43) in 1984, James D. D’Ianni (PhD ’38) in 1980, Karl A. Folke (PhD ’30) in 1962, and Farrington Daniels in 1953).

**Jim Skinner** participated in the NSF Chemistry Division Committee of Visitors in February 2007. He was elected a Member-at-Large, Chemical Physics Division of the American Physical Society in spring of 2006, to serve a three-year term. Jim also completed his last year as Department Chair on July 1, 2007. Jim's notable talks this year included a departmental colloquium at Howard University as part of our initial efforts to develop a more formal collaboration/exchange program, and a talk at the retirement Festschrift for Peter Trommsdorff in Grenoble, France.

For **Bob West**, the past year was one of international activity and included professional travel to Korea in May for a five-university lecture tour; Israel in early June for joint research at the Technion; Jordan in late June to present at an international conference comprised of delegates from 49 countries, mostly from the Arab world; Japan in July to present at an international symposium and give a brief talk in Japanese at the banquet; and England in September to speak at the annual Organosilicon Days.

For recreation, besides flying a little Cesna, Bob traveled to the Selkirk Mountains of British Columbia for a week of mountain-eering and later spent two weeks sailing and hiking in the wonders of Antarctica.
**This ‘n’ That**

**R. Byron Bird** (PhD ’50, Hirschfelder) received an Honorary Doctor of Science degree from Iowa State University on 5 May 2007. He had earlier received honorary doctorates from Lehigh University, Washington University (St Louis), Clarkson University, Colorado School of Mines, Texas A&M University, Kyoto University, Technical University of Delft, Eidgenössische Technische Hochschule (Zürich), and The Technion (Haifa). He is known for his books, including “Molecular Theory of Gases and Liquids” (Hirschfelder, Curtiss & Bird), “Transport Phenomena” (Bird, Stewart & Lightfoot), “Dynamics of Polymeric Liquids” (Bird, Armstrong, Hassager & Curtiss), and others.

**Nate Bowling** (PhD ’05, McMahon) accepted a position as Assistant Professor of Chemistry at the University of Wisconsin–Stevens Point.

**Richard Bunce** (PhD ’81, Zimmerman) of Oklahoma State University has been named the 2007 Oklahoma Scientist of the Year.

**Harry Chen** (PhD ’95, Hamers) is at KLA-Tencor doing systems engineering on wafer inspection tools for semiconductor fabrication.

**Marc Cicerone** (PhD ’94, Ediger) is now the leader of the Biomaterials Group in the Polymers Division at the National Institute of Standards and Technology.

**Terry Ding** (PhD ’07, Zanni) is doing a post-doc with John Fourkas at the University of Maryland.

**Eric Fulmer** (PhD ’06, Zanni) married **Jocelyn Cox** (PhD ’06, Crim) in August.

**Yiyong He** (PhD ’05, Ediger) recently began working for Dow in Midland, MI. He has a position in the Analytical Sciences group focusing on polymer problems and is working with **XiaoHua (Sam) Qiu** (PhD ’01, Ediger).

**Alexey Ignatchenko** (PD ’95–’98, Zimmerman) has taken a position as Research Scientist at the Energy & Environmental Research Center (EERC) at the University of North Dakota.

**Reinhart Keese** (PD ’62–’64, Zimmerman) from Univ. Bern in Switzerland, and his wife Telsche sent greetings remembering their Wisconsin days.

**Yong Seol Kim** (PhD ’05, McMahon) is a postdoctoral research associate with the QUASAR (Quantitative Spectroscopy for Atmospheric and Astrophysical Research) training network in Wuppertal, Germany.

**Amber Kruimmel** (PhD ’07, Zanni) is doing a post-doc with Dave Weitz at Harvard.

**Dan Little**s (PhD ’74, Zimmerman) students at the University of California – Santa Barbara organized an October Symposium in honor of Dan’s 60th birthday. The event was called “The Twists and Turns of Organic Chemistry: Academic and Industrial Perspectives—a Symposium in Honor of R. Daniel Little’s 60th Birthday.”


**Jianming Liu** (MS ’01, Hamers) and **Liman Wang** (PhD ’01, Smith) now live near Philadelphia, PA. Jianming was promoted to Manager of Electronic Quality Systems at Kodak. He retired from that post several years ago and reports that he and his wife Jenny have been doing volunteer work building science exhibits for their local science center.

**Evgueni Nesterov** (PD ’98–’02, Zimmerman) from LSU spoke at the Photochemistry Gordon Research Conference. **Laren Tolbert** (PhD ’75, Zimmerman) of Georgia Tech was a moderator, as was **Steve Fleming** (PhD ’84, Zimmerman) from Brigham Young. Also participating were **Rich Givens** (PhD ’67, Zimmerman) from the University of Kansas and **Andrei Kutateladze** (Asst. Scientist ’92–’95, Zimmerman) from the University of Denver.

(continued on page 40)
The Chemistry Department is blessed with many generous alumni and friends, and nowhere is that more evident than in the array of funds of various types that we can draw on for support of our activities. These funds include those that support general operations, scholarships and fellowships for students, lectures, seminars, research, awards and publications. We have listed here all of the funds the UW Foundation administers, plus the trust funds that have been set up to benefit Department activities. For contributions to Foundation accounts, checks should be made out to the UW Foundation, not to the Chemistry Department; gifts can also be made online at https://www2.uwfoundation.wisc.edu/MultiPage/processStep1.do. Gifts to the UW Foundation are tax deductible, and many companies provide matching contributions, allowing you to multiply the value of your gift. When you send your donations to the Foundation, you can specify that your gift go to Chemistry, and further specify any of the funds. Donations to trust funds must be made out to the Chemistry Department, with the particular trust noted on the memo line.

Donors are acknowledged every year on the pages following our listing of funds. You are all essential to the continued high caliber of the Chemistry Department in its teaching, research and outreach missions.

Address gifts/correspondence to the UW Foundation, 1848 University Ave., Madison, WI 53708 or to the Chair, Department of Chemistry, University of Wisconsin, 1101 University Ave., Madison, WI 53706

OF SPECIAL INTEREST IN 2006–2007

Although we appreciate all of our donors, the following funds are of very broad application to Department activities, or had some special event occur in 2006–2007.

Department of Chemistry Fund 1222137
Supports research and teaching activities in the Department.

Alpha Chi Sigma Alumni Endowed Scholarship Fund 12224506
Established in 2006 for the purpose of providing scholarship support for undergraduate students in the Chemistry, Biochemistry, or Chemical Engineering Departments. The scholarship was first awarded in 2007.

Badger Chemist Fund 1222534
Provides funds to support the Badger Chemist and other Department publications.

Chemistry Fund for Interactive Education 12224764
Established in 2006; to support the research, teaching and outreach activities of Dr. Ieva Reich.

David F. and Donald G. Ackerman, Jr. Wisconsin Distinguished Graduate Fellowships 12223243
Supports graduate students in Chemistry. First awarded Summer 2007.

Farrington Daniels Ethical Leadership Fellowship Fund (Grad) 12223995

George J. and Arleen D. Ziarnik Scholarship Fund (Undergrad) 12224870
Established in 2007 to honor the memory of George J. Ziarnik by presenting scholarships to Wisconsin residents majoring in chemistry.

Hach Scholarship Fund to Develop HS Chemistry Teachers 12224870
Established in 2007 by the Hach Scientific Foundation, this fund will provide scholarships to undergraduates who are future high school chemistry teachers.

Harlan L. and Margaret L. Goering Organic Chemistry Fellowship Fund (Grad) 12223951
Established in 2004 by Margaret Goering’s will, in honor of her late husband, Professor Harlan Goering. The fellowship will reward excellent graduate students in Organic Chemistry, and was first awarded in 2007.

Irving Shain Chemistry Colloquium Series Fund 12224514
Established in 2006 in conjunction with the ceremony honoring Irv Shain with the naming of the “Irving Shain Research Tower”. The First Irving Shain Colloquium was presented in 2007.
### Student Support

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**LECTURESHPIS/PROFESSORSHIPS**

**Evan P. Helfaer Fund** 32225081A
Provides funds to support endowed chairs in the Chemistry Department.

**H. L. and M. L. Goering Visiting Professorship Fund** 12222391
Provides funds to support a Visiting Professor in Organic Chemistry.

**Irving Shain Professorship Fund** 12224681
Established in 2006 with a gift from Irv Shain for a permanent professorship in the Chemistry Department.

**John D. Ferry Lectureship in Macromolecular Science** 12222793
Provides funds to support a Lecturer in Macromolecular Sciences.

**John E. Willard Lectureship** 1222829
Funds a special seminar in Physical Chemistry.

**Joseph O. Hirschfielder Professorship Fund** 12220310
Provides funds to support an endowed chair.

**McElvain Seminar Fund** 12220241
Supports the ongoing seminar series organized and run by graduate students in the Department of Chemistry.

**Ralph Hirschmann Lectureship** 1222295
Funds a Visiting Professor in Organic, Bioorganic or Physical Organic Chemistry.

**V. W. Meloche-Bascom Professorship** 1222889
Provides funds to support an endowed chair.

**V. W. Meloche Lectureship** 1222825
Funds a special seminar series in Chemistry.

**Farrington Daniels Memorial Fund** 1222324
Funds special projects relating to the benefits of science to society.

**Harry L and A Paschaleen Coonradt Fund** 12221413

**Jean Irene Love Fund** 12223870
Established in December 2003 by the family of Jean Irene Love and John Edmund Wright, to remember Jean’s kindness, her self-sacrifice, and her deep and unconditioned love for all people.

**John and Caroline Dorsch Fund** 12220322

**Les Holt Memorial Endowment** 12223533
A general fund established with a gift from the estate of Professor Les Holt.

**Norman G. Mailander Fund** 12224058
Established in 2004 by Norman Mailander’s will, for special enhancement of the Department of Chemistry in the College of Letters and Science at the University of Wisconsin – Madison.

**Lloyd L. Withrow Fun** 12221190

**Paul A. and Jane B. Wilson Fund** 32220550

**Thomas B. Squire Fund**

**Bio-Analytical Chemistry Fund** (Lloyd Smith) 12220368

**Carbohydrate Chemistry Research Fund** (Laura Kiessling) 12221999

**Chemistry Catalysis Fund** (Shannon Stahl) 12223733

**Kocher Award** (Thomas Brunold) 12223165

**Lawrence Dahl Research Fund** (Larry Dahl) 12222076

**Nuclear Magnetic Resonance Research Fund** (Tom Farrar) 12221877

**Organic Chemistry Research** (Hans Reich) 12220190

**Organic Research Studies Fund** (Howard Zimmerman) 12220747

**GENERAL DEPARTMENTAL SUPPORT**

These funds provide key support for specific purposes or for our new initiatives.

**Chemistry Building Fund** 12221293
Supports continued remodeling of Chemistry buildings. The last bill for the new construction and major remodeling project was paid in late 2006. This fund will continue to pay for construction such as remodeling for new professors.

**Community-Building Fund for Chemistry** 12223316
Provides funds for receptions, retirement parties, funeral memorials, and other similar activities; established in 2001.

**Dr. Norbert Barwasser Chemistry Fund** 32225010
Benefits the Department of Chemistry research and programs.
In addition to the above Foundation accounts, the following trust funds have been established to support Department programs.

**STUDENT SUPPORT**
- Belle Crowe Fellowship
- Daniel L. Sherk Award in Chemistry
- Edward Panek Memorial Scholarship
- Hoechst Celanese Foundation Chemistry Department Fund
- Krauskopf Chemistry Award
- Mabel Duthey Reiner Scholarship
- Margaret McLean Bender Scholarship in Chemistry
- Martha Gunhild Week Scholarship
- Paul J. Bender Memorial Fund
- Richard Fischer Scholarship
- Sam Charles Slifkin Award in Chemistry
- Willard W. Hodge Scholarship in Chemistry

**DIVISIONAL and INDIVIDUAL SUPPORT**
- Arthur C. Cope Scholar Grant (Casey)
- Chemistry Department Special Library Fund
- Chemistry Research Fund (Reich)
- Dreyfus Teacher-Scholar Award (Nathanson)
- Hilldale Foundation Funds
- Innovation Recognition Research Fund (Casey)
- John Edmond Kierzkowski Memorial Trust (Library)
- MacArthur Fund (Smith)
- Steenbock Professorship in Chemical Sciences (Casey)
- Theoretical Chemistry Institute Fund

**LECTURESHIPS/PROFESSORSHIPS**
- James M. Sprague Lectureship
- Karl Folks Lecture Series in Chemistry

**GENERAL DEPARTMENTAL SUPPORT**
- Chemistry Building Fund
- Hoffman-La Roche Foundation Chemistry Department Fund
- Howard H. Snyder Chemistry Department Fund
- Stephen E. Freeman Chemistry Department Fund
- Thomas R. Kissel Chemistry Fund

In addition to honoring and acknowledging those people who donate to the Department to help support our Teaching, Research, and Outreach missions, we would like to also honor the people for whom funds are established and named. Many of you have donated to pay tribute to a mentor, colleague, friend, or relative in the Chemistry Department. This is a tribute not only to the donors, but to the people memorialized in donations.

David F. and Donald G. Ackerman  
Norbert Barwasser  
Margaret McLean Bender  
Paul J. Bender  
Leah Cohodas Berk  
Richard B. Bernstein  
Michael Berry  
Don Brouse  
Roger J. Carlson  
Harry and Helen Cohen  
Harry L. and A. Paschaleen Coonradt  
Belle Crowe  
Farrington Daniels  
John and Caroline Dorsch  
Andrew D. Dorsey  
John D. Ferry  
Henry and Eleanor Firminiac  
Richard Fischer  
Karl A. Folkers  
Stephen E. Freeman  
Harlan L. and Margaret L. Goering  
Evan P. Helfaer  
Eugene and Patricia Kregner Herscher  
Elizabeth S. Hirschfelder  
Joseph O. Hirschfelder  
Ralph Hirschmann  
Willard W. Hodge  
Les Holt  
Michael S. Kellogg  
John E. Kierzkowski  
Thomas R. Kissel  
Francis C. Krauskopf  
Edwin M. and Kathryn M. Larsen  
Jean Irene Love  
Norman G. Mailander  
Samuel M. McElvain  
Villiers W. Meloche  
John and Elizabeth Moore  
Wayland E. Noland  
Edward Panek  
Gary R. Parr  
Mabel Duthey Reiner  
Daniel H. Rich  
John L. Schrag  
Irving Shain  
Bassam Z. Shakhashiri  
Daniel L. Sherk  
Sam Charles Slifkin  
Howard H. Snyder  
James M. Sprague  
Thomas B. Squire  
James W. Taylor  
Walter W. and Young-Ja C. Toy  
John and Dorothy Vozza  
Pei Wang  
Martha Gunhild Week  
Alfred L. Wilds  
John E. Willard  
Paul A. and Jane B. Wilson  
Lloyd L. Withrow  
George J. and Arleen D. Ziarnik
This list acknowledges donors to all Departmental funds from July 2006 through June 2007, as recorded by the University of Wisconsin Foundation.
We thank each of you for making the improvement of our program possible.
This ‘n’ That
(continued from page 32)

Beth Nichols (PhD ’06, Hamers) is at Dow Chemical in Midland, Michigan.

Richard Pagni (PhD ’68, Zimmerman) from the University of Tennessee mentions that he now consults for Oak Ridge National Lab about one day a week. But he keeps busy at the University, now more of a physical chemist than organic.

Albert Pratt (PD ’67-’69, Zimmerman) from Dublin City University, Ireland, wrote from France where he has been traveling. He has been President of DCU for the last seven years and now is considering retiring. His wife, Iona, also send greetings.

Jonathan Rich (PhD ’82, West) was hired as the new President and CEO of Momentive Performance Materials. Momentive is a premier specialty materials company providing high-technology materials solutions to the silicones, quartz and ceramics markets. Jonathan is the former president of Goodyear Tire and Rubber Co.’s North American Tire Business.

Tom Kissel (PhD ’74, Blaedel) (shortstop) and Rich Saykally (PhD ’77, Woods) (pitcher) led the Chem team to the league championship in fast pitch softball in 1972. Rich is now The Class of 1932 Professor of Chemistry at UC-Berkeley, leading a large research group in the study of water and aqueous phenomena: http://www.cchem.berkeley.edu/rjsgrp/.

Kiu-Yuen Tse (PhD ’07, Hamers) is a researcher at 3M Company in Minneapolis, Minnesota.

New Badger Chemists
(continued from page 7)

MAY 2007

Carter Win Abney
Rachel Renee Butorac
Blake Carlson
Joshua Isaac Cutler
Drew William Dorshorst
Joyce Ai Vee Er
William Scott Fleming
Ry Roger Forseth
Thomas Doran Garvey
Erik Scott Goebel
Reece Joseph Goiffon
Julie Lynn Harris
Yeng Her
Aaron T. Herrmann
Jeffrey Thomas Kokott
Leah Christine Konkol
Alexander Jacob Kostner
Brett Mickel Kroncke
Andrew Charles Malinowski
Mark Edward Norton
Joshua Pletzke
Steven Daniel Poff
Eric Thomas Poweleit
James Michael Raspani
Patrick Joseph Robertson
Michael Isaac Rothmann
Amy Katherine Rutz
Graham Thomas Sazama
Bryan James Sazama
Andrea Rae Stoneman
Matthew Robert Van Hout
Please send news items for any section of the Badger Chemist to:

Matt Sanders
Chemistry Department
1101 University Ave.
Madison, WI  53706

msanders@chem.wisc.edu

608-263-4693

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