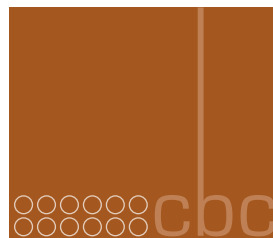


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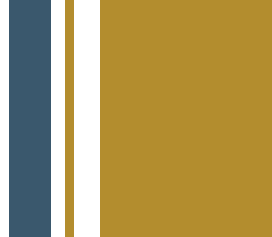


a newsletter for alumni and friends of  
Chemistry & Biochemistry | Fall 2010

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a message...



## ...from the CBC Chair and Co-Chair

Dear Colleagues:

This past year, 2009–2010, has been an eventful year for the Department of Chemistry and Biochemistry. This was our first year as a newly merged department (although a few faculty still remember when chemistry and biochemistry were previously one department). We have been very busy adjusting to our new administrative structure with a Chair and Co-Chair, redistributing staff roles, learning the cultural differences between the former Chemistry and Biochemistry faculty and staff, and hiring new staff and faculty.

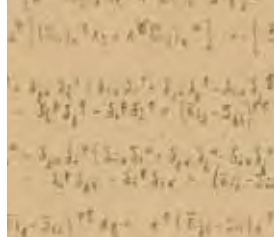
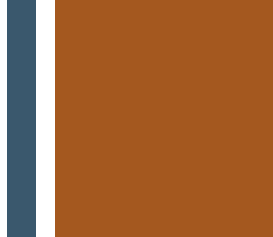
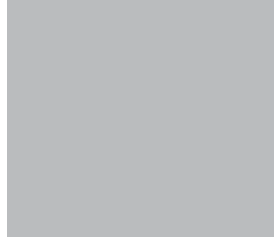
We were very fortunate to hire three new faculty whose research is described in this newsletter. All have arrived and are busy teaching and setting up their labs. **Michael Heien**, a bioanalytical chemist, moved into the former Atkinson space in Marvel. **Elisa Tomat**, a bioinorganic chemist, and **Jón Njarðarson**, a synthetic organic chemist, are in temporary space while we remodel several modules on the 4th floor of Marvel for them. The whole department has found the new faculty to be enthusiastic contributors to our mission and will watch with great interest as they develop their exciting research programs. In addition to hiring new faculty, we are very pleased that **Jeff Pyun** has been promoted to Associate Professor and **Zhiping Zheng** has been promoted to Full Professor. Although it is sad to lose him from our department after 26 years, we congratulate **Mark Smith**, former head of the department for eight years, on his selection as Dean of Natural Science & Mathematics at the University of Houston, Texas and wish him the best as he moves upward in university administration. We also offer our best wishes to Professor Elizabeth Vierling, who is moving to U Mass Amherst for personal and professional reasons after 25 highly productive years at UA.

We were also fortunate this year to hire a new Director of Operations, **Beverly Travers**, after Susan Richards moved to another university position, to serve as Campus Leader of Business Intelligence for the Mosaic Project. Beverly has been a great addition, helping the staff adjust to new roles and relieving the Chair and Co-Chair of some of the load of daily department operations. We are fortunate to have hired someone who has previous experience managing a science department, overseeing performance reviews, and overseeing renovations. Our business, administrative, computer/IT support groups, storeroom, building management, and academic services teams continue to work extremely hard and have made our merger possible.

Best wishes, Mark Smith!

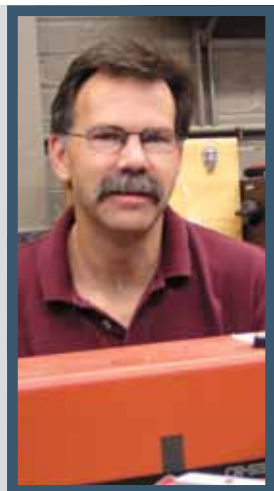


a message	02
alumni news	04
faculty news	06
in memoriam	08
research focus	11
staff and dept. news	14
MARC program	16
student news	18
postcards	20
testimonials	24
student recognition	26
events & outreach	28
donations	31



Our students and faculty continue to win honors and awards at a high pace, as described in this newsletter. Our faculty are working hard to obtain and expand our extramural funding and to direct excellent research programs. Our Research Support Services (RSS) staff are working very effectively to provide outstanding service for research groups both inside and outside the department. Our students and faculty are also traveling the globe, performing science and meeting scientists. Some of their travel experiences are described on the following pages.

On a sad note, we provide brief obituaries for department members and friends of the department who passed away this year. We can only offer our condolences to their family and friends and hope that some relative state of peace can be achieved as they and we mourn these losses. We depend on you to let us know of other losses that we may not be aware of, so please send information to us when possible.



We close by wishing you a productive and peaceful year ahead. We strive for excellence knowing that we have wonderful alumni and friends who support us and we hope to continue to improve our communication with you. Have a blessed holiday season and try to stop in and visit us if you are in Tucson or visit with faculty and staff and other alums at one of our receptions at national meetings (see back cover).

With warm wishes,

—Vicki Wysocki, CBC Chair  
Scott Saavedra, CBC Co-Chair



## ←-----○ **Frank Aylward**

BS MCB/BIOC, Class of 2008,  
Howard Ochman group

"I am currently a third-year graduate student in the Microbiology Doctoral Training Program (MDTP) at the University of Wisconsin-Madison. I am working in the laboratory of Cameron R. Currie, where I am investigating the ecology and dynamics of microbial communities. My work has implications for biofuel development and biotechnological innovation. I hope to pursue a career of scientific research."



## ←-----○ **Trahern Jones**

BA Biochemistry, Class of 2008

Trahern Jones is currently enrolled in the Mayo Clinic College of Medicine class of 2013. He is looking towards an eventual career in primary care and medical education, particularly with regards to developing areas. At the moment, he is engaged in research in medical history, anatomy education, and surgical hernia repair. He is working on a project towards expanding services at a clinical microbiology laboratory at the Kibogora missionary hospital in southwest Rwanda.

## **Ravi Goyal**

BS Biochemistry & Molecular Biophysics,  
Class of 2008, Tracy Brooks group

"I currently work in San Francisco for a management consulting firm, ZS Associates, that specializes in sales and marketing issues specifically in the biotech/pharma industries. I have been working here almost two years now. A lot of the work I am currently doing is helping our clients understand their market, including how doctors treat patients in a particular disease area, what therapies they use, and where our clients fit within that market. I use my biochemistry background to understand the biology of different disease areas, the specific pathways (mechanism of action) of therapies, as well as to gain a deeper understanding of metrics like efficacy that come from clinical trials, all in an effort to help our clients better understand their market and positioning them to make better sales and marketing decisions."

## **Angela Folley** (formerly Peiffer)

BS Biochemistry & Molecular Biophysics, Class of 2008, Jesse Martinez group

"After graduating and wrapping up four years of cheerleading at UA in 2008, I got married to Austin Folley, a 2008 Biosystems Engineering graduate from UA. Being that we were Ohio natives, we moved to Columbus for Austin to attend medical school at Ohio State. I began working at Nationwide Children's Hospital in Columbus in the Microbial Pathogenesis Department. I studied the effects of *Neisseria gonorrhoeae* on human placental epithelial cells and cervical cells in hopes of creating more effective treatments for women and children as well as ways to reduce the risk of preterm births. I realized although I loved research, something was missing, so I applied to Ohio State's Master of Education program in order to obtain my teaching license. The program was for 7th to 12th grade science, math, and engineering students. I began the program in the summer of 2009 and finished up this summer. Thankfully, I got a job teaching ninth grade science at Westerville South High School in the greater Columbus area. During the interview process, employers were very interested in my degree and research experience. I absolutely love teaching and my research background was a big part of me getting hired!"



## Maxim Shokhirev

BS Biochemistry, Class of 2008,  
Osamu Miyashita group

Max is currently starting his third year as a bioinformatics/systems-biology graduate student at the University of California, San Diego. Part of the Signaling Systems Laboratory at UCSD, Max is focusing on quantifying the population dynamics of proliferating B-cells and enjoys using both the experimental and computational skills he learned as an undergraduate at the University of Arizona. He was recently awarded the NSF Graduate Research Fellowship and presented a talk on his project at the Bioinformatics and Systems Biology Expo at UCSD. When not in the lab, Max enjoys tennis, ballroom dancing, and the wonderful city of San Diego.

## Michael Mannil

BS Chemistry, Class of 2009

"I just started my graduate program at the University of Denver Daniels College of Business. It is a one year accelerated program for the Masters of Science in Real Estate and Construction Management. This past year I have been working in commercial real estate sales and property management. I really enjoyed it, so I decided to take it a step further and get a degree and hopefully within the next couple of years open up a brokerage/development company. UA has taught me a lot and a lot of it I carried into my future career."

## Matthew Streeter

BS Chemistry, Spring 2009, Doug Loy group

"I am currently in Salt Lake, and I am in the University of Utah's analytical chemistry PhD program. I'm married and have a baby girl on the way (due in November)."

## John Thomas Bradshaw

PhD Chemistry, Class of 2005, Saavedra/Armstrong group

"I am a former Saavedra/Armstrong group member from the late 90s early 00s. I am still with Artel, the same employer that I started with in 2001, as a Senior Development Scientist. I am working away, living life with my wife and four kids, and enjoying the beauty of Maine! Working for a small company has required many hats, and has taken me to many parts of the world."

## Katy Gazda (formerly Ruiz)

BS Biochemistry & Molecular Biophysics, Class of 2007,  
Leif Abrell group

"After graduating from UA I went and got a Masters in Education at ASU (I know, but I wanted to come back home to Mesa). I started teaching biology at Chandler High School in Chandler in 2008 and love it! I also got married in March 2009."

## Donna Montavon (formerly Friel)

BS Chemistry, Class of 2003, Robin Polt group

"I am in Chicago, IL working for Abbott Labs as an Associate Scientist II. I received my Master's degree from Boston College in April 2008 with Amir H. Hoveyda. I am now Donna Montavon as I got married in April 2009."

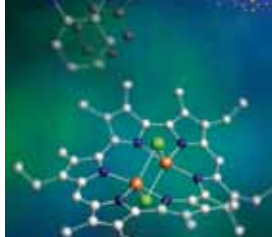
## Alumni Briefs

Cliff and Marilyne Stains, PhD Summer 2008 and PhD Spring 2007, are both working in Boston. Cliff is a postdoc in the Imperiali lab at MIT and Marilyne is a Research Assistant Professor at UMass Boston.

Julia Metzker (formerly Moberg), PhD Chemistry, Class of 2001, is an Assistant Professor of Chemistry at Georgia College & State University.

Nichole Bordowitz, BS Chemistry, Class of 2009, is currently completing her application to the Air Force Officer Program.



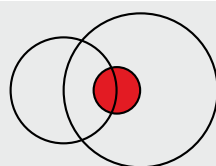


## John Pollard Receives Prestigious Teaching Award

Dr. John Pollard, Lecturer and Director of the General Chemistry Program recently received the UA Foundation Leicester & Kathryn Sherrill Creative Teaching Award. A distinguished university committee reviewed and considered the nominations for this award and the nomination documented his exceptional efforts in excellence in teaching at the undergraduate level. A plaque will be placed in the Donna Swaim Honors Lounge and John received a monetary award presented at the Awards of Distinction Luncheon on April 8, 2010. Congratulations.

## Enemark and Tollin Make Front Page News

Professors John Enemark's and Gordon Tollin's article *Elucidating the Catalytic Mechanism of Sulfite Oxidizing Enzymes using Structural, Spectroscopic and Kinetic Analyses* was selected by *BIOCHEMISTRY* for publication and will be featured on the journal's homepage. Please visit [here](#).



## The Galileo Circle

### Neal Armstrong Receives Honor

Neal Armstrong was named to 2011 Galileo Circle of Fellows, one of the highest honors bestowed upon faculty in the College of Science. The Galileo Circle is a society of individuals whose support is critical to the continued excellence in the sciences at the University of Arizona. This society of engaged individuals supports the activities that nurture the future of science and create meaningful connections among patrons and scholars through seminars, lectures, and scientific excursions.

## Tenure Announcements

Effective this fall two Chemistry and Biochemistry faculty members were promoted.

**Professor Jeff Pyun** was promoted from Assistant Professor to Associate Professor with tenure; **Professor Zhiping Zheng** was promoted from Associate to Full Professor. This is an important career development for each faculty member and shows that they are respected by their peers and colleagues in science as well as by the University community at large. Both have national and international reputations and they and their groups are making great strides. We are all looking forward to the continuing outstanding science these two professors are sure to accomplish in the coming years.



## New Faculty



○ **Jón Tryggvi Njarðarson:** The main objectives of our research program at the University of Arizona are focused on the development of useful new synthetic strategies and methods for organic chemistry and the total synthesis of complex natural products exhibiting unique biological profiles. In our laboratory these two research programs are usually closely linked as exemplified by the fact that all of our synthetic blueprints are expected to showcase a new synthetic method or a unique disconnection that is ideally suited for the target architecture thus ensuring a short and efficient synthesis. By adhering to such stringent design criteria, we find without exception that a fertile environment for new ideas is invariably created. It is important also not to forget that in addition to the valuable training that total synthesis provides young students, the unanticipated challenges and the realization of limitations of existing methods that most good synthetic plans are faced with constantly remind us that the richest source of outstanding new ideas is often the synthetic journey itself.



○ **Michael Heien:** My research interests lie in bioanalytical chemistry, specifically understanding the synapse and chemical communication. The synapse is central to processing of information and communication between neurons, and molecular imaging of the synapse can offer insight into the nature of the synapse and its formation. This involves the development of new methodology and techniques to measure mass-limited samples and then applying these to relevant systems. Both electrochemical and mass spectrometric methods provide information regarding the chemical identity and concentration of molecules. These methods can also be combined with complimentary techniques such as electrophysiology and fluorescence imaging to provide insights into fundamental process at the cellular level.



○ **Elisa Tomat:** My research interests encompass inorganic chemistry, biochemistry and cell biology, and address open questions on the rich chemistry of transition metal ions in biological systems. Because of the interdisciplinary nature of such queries, the design of research plans in my laboratory combines principles of synthetic and coordination chemistry with current knowledge of cell metabolism and molecular biology. Employing a host of techniques that reflect these interwoven disciplines, research in my group draws inspiration from the roles of metal ions in living systems for the design of metal complexes with specific metabolic and/or catalytic functions. The tools of synthetic chemistry and spectroscopy are used to examine basic cellular processes and to reveal novel therapeutic targets. An emphasis is placed on the contributions of investigated metal complexes to cell proliferation and oxidative stress, and on the biological inorganic chemistry involved in cancer physiology. Current projects study the iron metabolism of cancer cells, the reactivity of metalloradical complexes towards reactive oxygen species, and the bioinorganic chemistry of wound healing.



o **Michael A. Cusanovich (1942–2010):  
A Retrospective**

by Gordon Tollin, Regents' Professor Emeritus



Regents' Professor, Vice-President for Research, Dean of the Graduate College, Director of the Arizona Research Laboratories, biotechnology advocate, biochemist, teacher, colleague, research collaborator, friend: Mike Cusanovich wore many hats as a member of the University of Arizona community, and will be remembered in many ways and for many reasons. First and foremost, however, Mike was a scientist, starting with his undergraduate studies in chemistry at College of the Pacific (now University of the Pacific), continuing with his graduate work at the University of California, San Diego (where he received a Ph.D. in Biochemistry with Martin Kamen in 1967) and as a post-doctoral scientist at Cornell University (working for two years in biophysical chemistry with Quentin Gibson), and culminating in his academic career here at the UA, which began with his initial appointment as an Assistant Professor of Chemistry in 1969 and continued (1978–2010) in the faculties of the Departments of Biochemistry, of Biochemistry and Molecular Biophysics and (most recently) of Chemistry and Biochemistry.

Mike's scientific interests were extremely broad and varied, with a particular emphasis on the mechanisms of biological electron transfer, where he was a major contributor to our understanding of bacterial cytochromes. He focused especially on the physical and chemical interactions that occur during protein-protein interactions that control biological specificity during cytochrome function, and on the structural features that mediate protein stability and dynamic properties. Mike's work on heme proteins was widely recognized by his peers, and his laboratory was an invaluable and unique source of these materials for scientists worldwide who had similar interests. He collaborated extensively both within and outside of UA. His work utilized a broad range of biophysical and biological methodologies, including stopped-flow kinetics, laser flash photolysis, X-ray crystallography, NMR, mass spectrometry, computer modeling, site-directed mutagenesis and genome sequencing. Other major scientific efforts in the Cusanovich laboratory involved sensory biology, ranging from the visual process in mammals to bacterial signaling by Photoactive Yellow Protein (which was discovered in his lab by Terry Meyer), and the development of algae as a source of hydrocarbons for the production of biofuels in the desert Southwest. In all of his scientific work, Mike asked fundamental questions that illuminate the most basic processes found in all living cells.

As a complement to his research interests, Mike was continually involved with student teaching and advising at all levels, undergraduate, graduate and post-doctoral, both in the classroom and in the laboratory. He was also heavily involved in service activities, both within and outside of the university, including departmental and university-wide committees (he was a major factor for many years in the Committee of Eleven and the Faculty Senate, and was a tireless champion of faculty rights). Mike spent a year at the National Science Foundation in Washington as a program director in biochemistry.

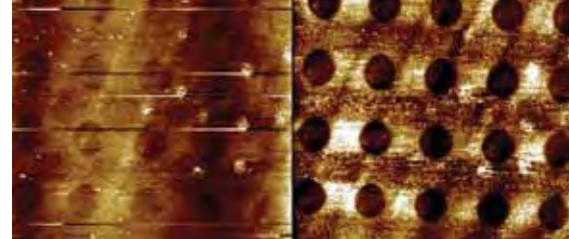


Mike's career as a top-level administrator at the University of Arizona was extraordinary in many ways. It began in 1987 when he was appointed as the interim vice dean of the Graduate College and continued a year later when he was named as the Vice President for Research and Dean of the Graduate College, a post he held for the next 10 years. During that time, Cusanovich was heavily involved in the explosive growth of the UA in the sciences, and especially in the development of the Mount Graham International Observatory, which he championed in the face of much criticism and controversy (particularly regarding the squirrel population on the mountain), and which has become a major world center for astronomy research. He was also a longtime director of the Arizona Research Laboratories (ARL). He lobbied strongly to attract and nurture high-tech industries in the state, and helped to found and headed the Bioindustry Organization of Southern Arizona, and served on the Board of Directors of the Arizona Bioindustry Association. Perhaps most amazingly, throughout all this period as a "full time" administrator, he managed to keep his research program active at a level high enough to earn him a Regents' Professorship in 2005, an award given for continuing excellence in scholarly activity and restricted to only 3% of the faculty! He received many grants from funding agencies for his work and published over 300 research papers, mainly in the most prestigious scientific journals. When he finally decided to resign as Vice-President in 1998, he resumed his duties in the Biochemistry and Molecular Biophysics Department and ARL without missing a step, and continued until his untimely death on April 12, 2010. Although he "retired" in 2007 and became an emeritus professor, his teaching, research and community activities did not change one iota, a measure of his dedication and professionalism.

If one were to choose a single phrase to characterize Mike Cusanovich it would be "problem-solver par excellence." He loved nothing better than to be faced with a difficult task to tackle, and he was able to function in this capacity with equal facility in both the scientific and political worlds. He had the rare ability to see through to the heart of a problem, whatever its nature, to determine what the best solution was, and even rarer to work tirelessly to see that the solution was implemented, doing whatever was necessary to accomplish this. He was afraid of no one and of nothing in the pursuit of what he considered to be right, and he continually provided a strong and outspoken voice for excellence at all levels of academia. In some quarters, this was greatly admired; in others perhaps less so. However, as a consequence of his many talents and his determination, his impact on the University and the State of Arizona was enormous and long-lasting. He was one of a kind and his contributions will be sorely missed by all.

Honor Professor Cusanovich's distinguished career and significant contributions to the Department of Chemistry and Biochemistry with a lasting gift to the College of Science.

Please go to [the CBC donation page](#) for more information.



←--○ **Remembering Prof. Krishna Vemulapalli**

by Dr. Stephen Kukolich

We lost a close friend and colleague, G. Krishna Vemulapalli on February 14, 2010. Krishna was a very kind man and extraordinary teacher who quickly became a good friend with nearly everyone he met. He was born in India, received his B.S. and M.Sc. from Andhra University, and his Ph.D. in 1961 from Pennsylvania State University. He was a faculty member at Arizona since 1966. Krishna's primary research was electronic spectroscopy. He was very successful in the collections and analysis of s-tetrazine fluorescence spectra and the effects of molecular association. Many of his published papers were devoted to innovations in teaching chemistry, philosophy and the intersections of philosophy, quantum mechanics and statistical mechanics. He published a text, *Physical Chemistry*, in 1993 and a more concise text, *Invitation to Physical Chemistry* (Imperial College Press, 2010). This unique book presents a very modern view of all aspects of physical chemistry. We shall all miss him. A comment from Gene Mash: "What a shock and loss to us! I will miss seeing Krishna's smile whenever I met him on the UA mall going for coffee. A truly gentle man."



←-----○ **Jack Marvel**

We note with sadness that Dr. John (Jack) Marvel, a long-time friend and supporter of the Department, passed away on February 27, 2010 in Tucson, AZ. He was the son of the late Professor Carl "Speed" Marvel, the award-winning polymer chemist who was on the Chemistry Faculty at the University of Arizona from 1961 until his death in 1988. Jack Marvel also had a Ph.D. in chemistry and a distinguished career in corporate research and development with the Monsanto Company and Ethyl Corporation before retiring to Tucson in 1995.



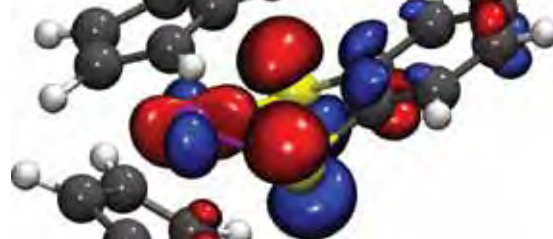
←-----○ **Doris Elaine Munday**

Dori passed away peacefully on July 28, 2010. Dori was born on April 25, 1956 in Seattle, WA. She graduated from the University of Washington and pursued a highly successful career as an administrator at the University of Arizona and the University of Washington.



←-----○ **Dean Edwin Carter**

Dean Edwin Carter Age 68, passed quietly on Friday, May 21, 2010 due to complications from his long struggle with Parkinson's Disease. After receiving his PhD at the University of Arizona, he worked as a Research Chemist with Shell in California for three years. He then returned to the University of Arizona, ultimately becoming a Professor in Pharmacology and Toxicology. During his thirty year career at the University, he was honored with the Education Award for his teaching accomplishments and the Lifetime Achievement Award for Metals Specialty research from the Society of Toxicology. He was also successful in initiating a Superfund Program at the University which included an outreach program with Mexico.

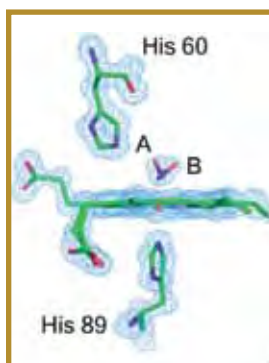
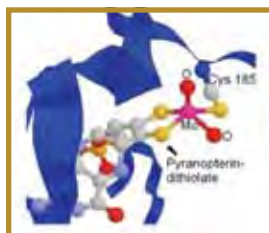


**Zhiping Zheng** is a full professor specializing in Lanthanide Coordination and Materials Chemistry, Supramolecular Chemistry, Molecular and Nanostructured Clusters, Luminescent and Magnetic Materials, and Catalysis. He can be reached at [zhiping@u.arizona.edu](mailto:zhiping@u.arizona.edu)

**Inorganic Chemistry** encompasses fundamental studies of the properties and reactivity of nearly all of the elements, and the roles of metals and other inorganic species in biological systems. The field covers wide ground from synthetic coordination and organometallic chemistry to bioinorganic chemistry to solid-state materials and nanotechnology and impacts diverse areas such as catalysis, novel functional materials, drug design, and energy technologies.

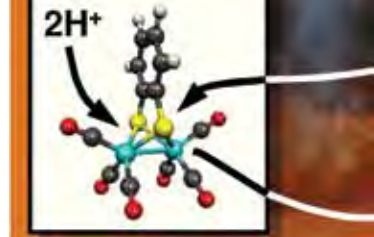
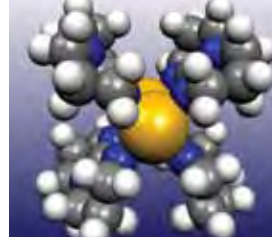
The interests of the University of Arizona inorganic faculty promise exciting research choices. Organometallic chemistry [**Lichtenberger, Zheng**] is represented by research in metal clusters, metal-metal multiply bonded species, and biomimetic chemistry. Examples of materials research [**Lichtenberger, Zheng**] include organic light-emitting diodes, molecular magnetic materials, and supramolecular materials for gas storage, separation, and catalysts for hydrogen generation. Bioinorganic chemistry [**Enemark, Miranda, Tomat, Walker**] encompasses research into metal-protein interactions, modeling of metalloenzymes, electron transfer, small molecule signaling, and pharmaceutical design.

Metal-centered catalysts are a key feature in biology, industrial processes, synthetic organic chemistry, and the creation of new kinds of materials. Creating new metal-based catalysts and understanding the chemical, structural, and electronic factors of successful catalysts are the primary thrusts of contemporary inorganic chemistry. The 2010 Nobel Prize in Chemistry, which was awarded for the development of a metal-catalyzed process for making carbon-carbon bonds, further underscores the importance of metal-based catalysts. Catalysis by metalloenzymes involves the interplay of molecular structure, electronic structure, and reaction dynamics. The research of the Enemark group deals with molybdenum enzymes, which are essential biocatalysts for all forms of life. In humans, sulfite oxidase (SO) is essential for normal neurological development in children. Direct investigation of the molybdenum center of SO enzymes using the unique variable frequency pulsed Electron Paramagnetic Resonance (EPR, departmental facility) provides insight as to the mechanism of catalysis and why certain mutations of the SO enzyme are fatal. The interpretation of EPR results is aided by isotopic labeling and by density functional theory calculations. Investigation of the effects of mutations on the reaction kinetics of SO using laser flash photolysis techniques provides additional insight about the catalytic processes of this vital metalloenzyme.



All chemical behavior may be viewed, in one sense, as the movement of electrons. An obvious example is the oxidation and reduction processes of metalloenzymes in biology, but so too is the selective making and breaking of bonds in industrial catalysis, the transport of electrons in molecular wires, and the interactions of molecules with light. A central theme of the Lichtenberger research has been to probe and understand chemistry at the level of electronic structure. Specifically, the research program encompasses studies of organometallic

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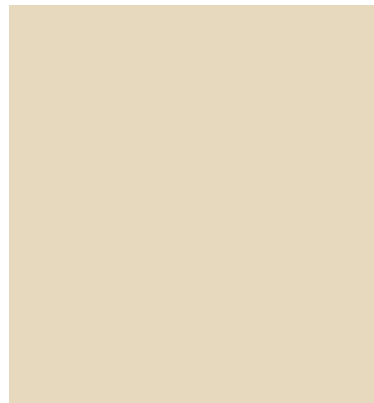
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structure, bonding, reactivity, and catalysis and extends to bioorganometallic chemistry, metal-metal bonding, molecular clusters, and related areas, and has moved most recently toward electron transfer processes, molecular electronics, and solar fuels. Many of the principles of electronic structure and bonding that have been discovered in the research have followed from the development and application of photoelectron spectroscopy, a technique that is often introduced in freshman chemistry texts. Computational chemistry is also an important aspect of the research, and photoelectron spectroscopy is the most direct method to test and validate electron energies in developing computational methods. The special nature of the research methods has led to numerous fruitful and exciting collaborations with scientists from around the world.

Nitrogen oxides are critical to normal physiology yet are also associated with diseases such as cancer and stroke. The primary objectives of research in the Miranda laboratory are elucidation of the fundamental chemistry of nitrogen oxides under biological conditions and development of compounds to deliver or scavenge nitrogen oxides. The ongoing projects include synthesis and characterization, both chemical and biological, of donors and scavengers of NO, HNO and other nitrogen oxides, development of analytical techniques for detection and measurement of these species, and elucidation of the chemical biology of nitrogen oxides. The projects are designed to answer questions of potential medical importance through a multi-disciplinary, collaborative approach. The ultimate goal is to develop a tiered understanding of the role of nitrogen oxides in biology beginning with molecular interactions and progressing from the biomolecular and systemic levels to finally the effects on animal physiology in order to provide methods to treat a variety of diseases.

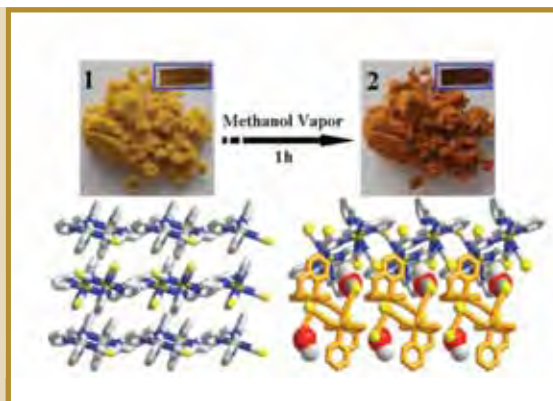
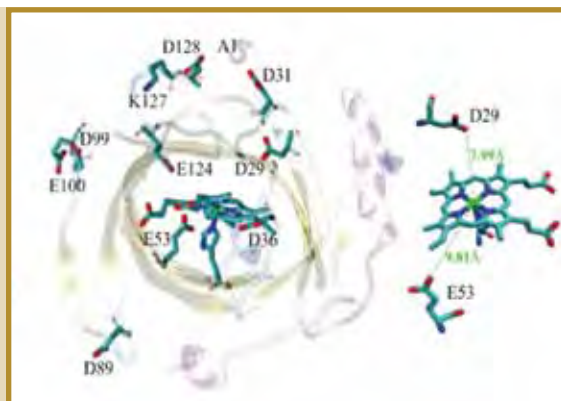
After many years of studying model heme complexes, the Walker group is now involved in the study of several heme protein systems: 1) the nitrophorins, which are NO-carrying heme proteins from the saliva of blood-sucking insects, that store NO in the salivary glands and release it in the tissues of the victim in order to obtain a better blood meal, 2) the cytochromes P450, which are monooxygenase enzymes that hydroxylate or epoxidize organic substrates, including drugs, and 3) the cytochrome bc<sub>1</sub> complex, which is involved in electron transport in mitochondria. The heme centers of these proteins can be studied in many of the same ways as can small molecules, i.e., by X-ray crystallography, nuclear magnetic resonance and EPR spectroscopies, and by a number of other spectroscopies that require the presence of unpaired electrons in the 3d orbitals of Fe.

The research of the Zheng laboratory is in the general areas of synthetic and structural inorganic chemistry, directed toward developing new paradigms of coordination chemistry and creating metal-containing functional materials. The unique and frequently aesthetically pleasing structures, interesting properties, and potentially



from top:

Drs. Miranda,  
Lichtenberger,  
Enemark, and Walker.



significant applications of transition metal- and lanthanide-containing substances provide multifold impetus for our efforts. Projects presently undertaken include 1) the design and synthesis of complexes of the transition metal and lanthanide elements with unique electro and photoluminescent properties for light emission and those with labile electronic states (spin crossover and valence tautomerism) for the development of sensory and information storage systems; 2) the assembly of polynuclear lanthanide complexes and exploration of their potential applications as new paradigms of contrast-enhancing agents in biomedical imaging; and 3) the development of multi-shell (magnetic, luminescent, and biocompatible) nanostructured platforms for integrated diagnostic and therapeutic applications.

We are extremely pleased to have the addition of **Dr. Elisa Tomat**, Assistant Professor of Chemistry, who is interested in synthetic, bioinorganic, and medicinal chemistry. Research in the Tomat laboratory combines principles of synthetic and coordination chemistry with current knowledge of cell metabolism and tools of chemical biology for the design of metal complexes with specific metabolic and/or catalytic functions in biological settings.

A wide range of courses related to inorganic chemistry includes core classes in group theory, reactivity and spectroscopy, organometallic chemistry and catalysis, bioinorganic chemistry, computational chemistry, and materials chemistry. The diversity of classes reflects the broad range of specialties and research interests of our faculty. Through individual choice from amongst such courses, students tailor their education to their own interests, thereby receiving an outstanding education and obtaining the expertise that prepares them for conducting research at the very frontier of this continuously growing and diversifying area of chemistry.



## Awards for Excellence 2010

**Amy S. Morris Staff Award for Excellence** Amy Morris, administrative associate and associate editor in CBC, is described by her nominators as a “can-do people person” who treats all faculty and students she works with as extended family. Amy provides administrative support for the teaching, research and service activities of approximately 25 faculty, research staff and graduate students on the third floor of the Carl S. Marvel Laboratories of Chemistry building. As part of her work, she has created a system of completely electronic records, saving reams of paper. In addition, she provides administrative support for *Organometallics*, an internationally acclaimed journal of the American Chemical Society.

**Anne Padias Billy Joe Varney Award Nominee** Nominated by Mark A. Smith

**Neil Jacobsen Staff Award for Excellence Nominee** Nominated by Ken Nebesny

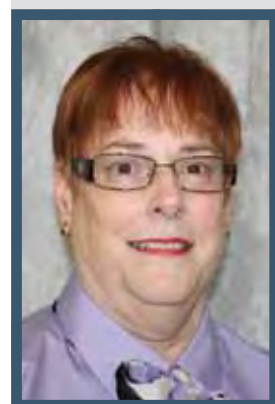
**Olivia A. Mendoza Staff Award for Excellence Nominee** Nominated by Vicki Wysocki

**CBC Business Office Team** (Amy Anderson, Irene Barriga, Luann Cordero, Selin Demir, Jamie Hussell, Vincente Leon, Talisha Mottinger, Sylvia Quintero, Bryn Stotler, Stacey Tutas)  
**Team Awards for Excellence Nominee** Nominated by John Enemark

**Deborah Kimball Family Spirit Award 2009**

## APAC Officers

Congratulations and best wishes to the 2010–2011 Appointed Professionals Advisory Council Executive Committee (the majority of whom are from our department!): Chair, **Ronald Wysocki, Chemistry & Biochemistry**; Vice-Chair, Mackenzie Massman, Arizona State Museum; and Secretary **Dee Belle-Oudry, Chemistry & Biochemistry**. APAC represents professional employees by taking an active role in shared governance and advising the University administration and other UA organizations on matters of concern to Appointed Professionals. APAC’s goal is to enhance the quality of career life for all Appointed Professionals by providing advocacy, information and resources.



## Jane Dugas Retires

After 25 years of dedicated service to the University of Arizona, Jane Dugas retired in February 2010. The Department held a reception for Jane and presented her with a few gifts to show our appreciation. Jane says she’s enjoying the freedom of retirement. She recently took a cruise to Alaska and had a great time.





## New Staff Members

- **Dr. Kevin Bao** is a newly added electrical engineer (supervisor) in ChIEF (Chemistry Instrumentation and Electronics Facility). Kevin came from microelectronics industry and has extensive hands-on experience in electronics, mechanics and various equipment and instrumentation. He worked as a semiconductor process development engineer and analog and hybrid IC designer in such companies as Texas Instruments, Thaler Corp. and Cirrus Logic. Kevin has a Ph.D. degree in electrical engineering from the University of Connecticut with research work in semiconductor devices including thin film deposition of II-VI compound semiconductor ( $Zn_{1-x}Cd_xSe$  ternary compound) for making blue semiconductor lasers using a UV photo-assisted MOCVD technique. With his broad skills in electronics and research background, Kevin will be a great addition to the Research Support Service (RSS) group at the Department of Chemistry and Biochemistry.

**Courtney Davis**, TSO Administrative Assistant, is a University of Arizona graduate with a bachelor of arts in history. She began working at Aflac while she finished her degree and after four years in insurance decided to make a career change. One year after making that decision she is happy to have found a position where her high pressure sales tactics aren't of any use. She is ecstatic to be getting married in November and can't wait to become Mrs. Campbell.

- Our new Director of Operations, **Beverly Travers**, started in April 2010. Beverly has over 30 years of experience in public education both in the classroom and central office administration. She earned a Bachelor of Science in Physical Education & Biology, and a Master's degree in Education at the University of Wisconsin-Superior and a Certificate of Advanced Graduate Studies (C.A.G.S.) in Curriculum at Rhode Island College.

Prior to arriving in Arizona, Beverly was employed by Brown University for ten years. She served as Manager of Training Programs where she directed training programs for 2,200 employees and coordinated major programs for manager development. She then served as Physics Department Manager for five years, involved with lab renovations, technology enhancements, upgrading office spaces and building a team with the eleven staff that supported the faculty.

Prior to leaving Brown, Beverly was the Director of Human Resources and Administration for the Division of Advancement where she supported 200 employees in their endeavors in the billion dollar campaign for "Boldly Brown." Beverly can be reached at 520-626-0585 or bztraver@email.arizona.edu.

**Christine Hiner-Kasten** was born in Phoenix, Arizona and grew up in Tucson from the age of four. She graduated from Rincon High School, attended the University of Arizona and completed her studies at the University of Utah. She joined the Admissions Department at the James E. Rogers College of Law in 2007 and is now very happy to be part of the Chemistry and Biochemistry Department working with Victor Hruby. Her most joyful times are spent with friends and family. She loves music, cooking, movies, gardening and especially travel.

# MARC Program



Marc E. Tischler is a professor of Biochemistry specializing in Metabolic, Endocrine and Medical Biochemistry Education. He can be reached at [tischler@u.arizona.edu](mailto:tischler@u.arizona.edu)

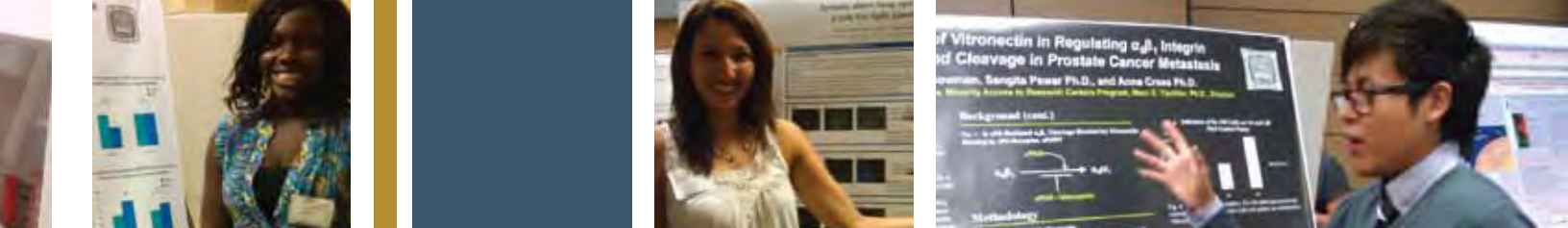
**Housed in the CBC Department** is the Minority Access to Research Careers (MARC) program, an NIH-supported training grant that provides unique research, mentoring, and financial and academic opportunity for undergraduates belonging to any group considered underrepresented in biomedical research and who have interest and potential to pursue a career in this broad field by seeking a PhD degree after graduation. Nationally there are 50 such programs in 15 states, Puerto Rico and the Virgin Islands. Marc Tischler has served as the director of this program since its inception in 1999 with Cindy Neal serving as the assistant director. Trainees are selected for the program via application and interview before the internal advisory committee consisting also of Maria Teresa Velez (co-PI; Associate Dean Graduate College), Erik Henriksen (Physiology) and Chuck Sterling (Veterinary Sciences). Trainees participate for two full years,

typically their last two years at UA. Besides having under-represented status, applicants must have a minimum science/math GPA of 3.0 and be enrolled in one of 11 majors (Biochemistry & Molecular Biophysics, Chemistry, Ecology & Evolutionary Biology, Biology, Mathematics,

Microbiology, Molecular & Cellular Biology, Nutritional Sciences, Physiology, Psychology, or Speech, Language & Hearing Science). Trainees receive financial support in the form of an annual stipend, assistance with tuition, fees and health insurance depending on need, and funding to attend a national scientific meeting annually.

During their first summer trainees work with outstanding faculty from Colleges of Science, Medicine, or Agriculture & Life Sciences with active and well-funded research programs to provide research guidance and intensive mentoring to participants. Additionally trainees attend weekly workshops covering a variety of topics including research ethics and seminars. Trainees also prepare a paper in the form of a scientific journal article based on their summer research. During the academic year trainees attend a weekly research seminar course that includes speakers from other institutions, UA and the trainees themselves. Trainees meet individually with outside speakers to gain experience in presenting their research in an informal one-on-one setting with scientists. During their second summer in the program, trainees participate in a summer research experience outside the UA. While most trainees participate in established summer research programs at Research I institutions throughout the US, ten trainees have conducted research abroad including in Australia, Peru (3), Japan, Spain, Belgium, France, Norway and Sweden.

As of May 2010, 70 trainees had both participated in the program and graduated. The current status for these trainees is: PhD completed, 6; MD completed, 6; enrolled in PhD programs, 24; enrolled in PhD/MD programs, 7; enrolled in MD programs, 10; enrolled in Vet or Pharmacy school, 2; current Fulbright scholar (accepted to grad program), 1; other current research activity, 7; other activities, 7. Hence 80% of the trainees have been accepted to doctorate level programs. For those pursuing PhD or MD/PhD, the institutions besides UA include: Berkeley (3), Columbia, Colorado, Iowa (2), Mayo, Stanford (2), UCSD (2), UCSF, UT Austin, UT Southwestern, UW, Vanderbilt (4), Washington U. St. Louis (2), Wisconsin (2) and Yale. Trainees have won a wide variety of awards including prestigious UA graduation awards and awards for outstanding national and local poster presentations.



Besides the benefits to the trainees, the MARC program has engaged in extensive outreach activities. The research seminar course is open to undergraduates—mostly students from underrepresented groups—who are interested in hearing research talks in a variety of areas. In the past, a summer colloquium had been offered in conjunction with New Start entitled *Careers in Science and Math for Minority Professionals*. We offer one-on-one tutoring experiences in General and Organic Chemistry, Biology, Calculus and Physics for underrepresented students to facilitate one of our aims—improving the academic performance of students in these groups. Graduate students with teaching experience are hired for the tutoring activity. Most recently the parent MARC grant received an ARRA supplement to conduct a Supplemental Instruction (SI) program for two years. In 2009–2010, SI was provided for Chem 151/152 and Bio 181/182. For 2010–11, SI is being provided for Chem 151/152 and Math 124. The SI instructors are comprised of Graduate Teaching Assistants from the appropriate departments. For CBC this has meant providing an opportunity for four different GTAs as well as an undergraduate preceptor for John Pollard's General Chemistry offering. Data about participants in these various outreach activities is maintained and show that, to date, we have engaged more than 1,150 different undergraduates (non-trainees) in these various activities over the past eight and a half years. Of these 95 later applied for the MARC program with 59 of these being accepted.

The next renewal, to be submitted in May 2011, will see the introduction of a new MARC program director, Megan McEvoy, with Marc Tischler becoming a co-PI to assist in the transition over the five years of the renewal. Hence the program will remain in the CBC family, hopefully for many years to come.



## Congratulations to Marc Tischler

Congratulations to Marc Tischler who received one of the Peter W. Likins Inclusive Excellence Awards for the 2010–2011 academic year. The Inclusive Excellence Awards (IEA) recognize individuals or groups who have demonstrated a significant contribution toward enhancing the academic distinction of The University of Arizona by creating a diverse and inclusive community. The award was presented by President Robert Shelton at a special reception in October.



## Undergrads Surprise Staff with Award

Program coordinator Olivia Mendoza and academic advisor Rachel Miller do an amazing job helping students navigate through a myriad of bureaucratic hoops. In appreciation, the biochemistry undergrads pooled their funds to throw an appreciation ceremony at which Olivia and Rachel each received an award to recognize their efforts. Some students spoke about their great experiences working with Olivia and Rachel: “Olivia and Rachel have done an outstanding job over the past couple of years ensuring that we were all taking the courses that we needed to be taking and had plenty of opportunities to help out with recruiting new students to the major, converse with the public, and meet faculty members.”

## CBC Undergraduate Poster Session



The Annual Undergraduate Program Information Fair and Research Poster Contest is an information fair hosted by the Department of Chemistry and Biochemistry to:

- highlight Departmental research opportunities for undergraduates through a poster session
- provide a forum to showcase the research projects conducted by our undergraduates
- provide information about preparing for graduate and professional school programs
- provide career information
- answer any questions from prospective majors about the Chemistry and Biochemistry program and its many opportunities



This year, 23 research posters were presented by CBC undergraduates, and over 300 visitors attended the event. The 2010 Award Recipients are:

### Physical Science Accomplished:

- 1st: Robert Stover
- 2nd: Sabri Gomuc
- Honorable mention: Greg Rosic
- Honorable mention: Alec Coffman

### Biological Science Accomplished:

- 1st: Ahmed Badran
- 2nd: Mounir Koussa
- Honorable Mention: Kurt Cox
- Honorable Mention: Alicia Gaj

### Physical Science Emerging:

- 1st: Vlad Kumirov
- 2nd: Kristen Sanders & Abby Gelb

### Biological Science Emerging:

- 1st: David Chen
- 2nd: Claire Nichols



## SMACS Wins Outstanding Chapter Award

University of Arizona's Student Members of the American Chemical Society (SMACS-UAN) has received an Outstanding Chapter Award for its 2009-2010 activities from the ACS. Emily Simpson SMACS-UAN President reports that the club has also been awarded the Green Chemistry Chapter award for its contributions promoting green chemistry practices on campus and throughout the community. The 2009-2010 award-winning chapters will be recognized in the November/December issue of *In Chemistry* magazine and at the ACS Student Chapter Award Ceremony that will be held at the 241st ACS National Meeting in March 2011 in Anaheim, CA.

## BECUR Conference

The University of Arizona ASBMB UAN chapter, along with the Student Members of the American Chemical Society (SMACS), is very pleased to announce that it will be hosting another southwest regional undergraduate research conference in February 25 and 26. BECUR has two intended purposes. First, the conference will create a forum for undergraduates from regional universities and colleges to communicate and network with each other concerning their research efforts and scientific development. Second, BECUR will provide the opportunity to develop the presentation skills essential for success at the larger national scientific conferences. Based upon the overwhelming success of last year's inaugural BECUR conference, we are expecting a greater number of submitted abstracts from undergraduates in the southwest region as well as an increase in the number of outstanding high school students working in research laboratories on our campus.

## Kurt Cox wins SURF

Kurt Cox, a chemistry junior at the UA, has been awarded a prestigious American Chemical Society Undergraduate Fellowship (SURF) from the ACS Division of Organic Chemistry to pursue research in the laboratory of Dr. Indraneel Ghosh in the Department of Chemistry and Biochemistry. Kurt comes from a storied family of brick masons, as his great-great-grandfather reshaped the Tucson landscape in early 1900s, and Kurt himself had a hand in laying bricks for the new gymnasium in his freshman year in college. Since early in his sophomore year, Kurt has been building molecules at the nanometer scale in the Ghosh laboratory, and Kurt's current research focuses upon the design, synthesis, and characterization of molecules that target proteins involved in the progression of cancer. By securing the SURF fellowship, Kurt will be funded as he continues with his project over the summer and have the opportunity to visit an industrial campus this fall for a dinner, award session, scientific talks, and to present the results of his research investigation at the poster session. The faculty of CBC is proud of Kurt's accomplishments so far and know he will represent CBC very well at the national level. Details of the SURF program are found [here](#).





## A Paris Adventure

from Biochemistry undergrad Adele Zhou



Paris. It's the City of Light. A city of culture...of fine dining and magnificent architecture. Many people dream of visiting this city at least once in their lifetime, it is a city for lovers: lovers of art, lovers of history, lovers of food, lovers of...love. Like most of people, I dreamed about the day that I would be able to visit Paris, little did I know that I would be given the opportunity of a lifetime—to spend an entire summer living and working in the heart of Europe. As a BRAVO! Participant I spent my summer researching in Dr. Vincent Colot's epigenetic lab at the l'Ecole Normale Supérieure located in the Latin quarters in the heart of Paris. Epigenetics is the study of inherited changes in gene expression caused by mechanisms other than changes in the underlying DNA sequence. Vincent's lab mainly focuses on the mechanism of DNA methylation and chromatin-based epigenetic processes in Arabidopsis. I was a bit nervous when I first met the 17 people that I would work with for the rest of summer. But there was no reason for me to be nervous, everyone was so accommodating and always so willing to help and answer my questions.



My project focused more on the methylation state of newly inserted transposable element copies in Arabidopsis. Transposable elements (TEs) are pieces of DNA that can move around to different positions within the genome. These are the “jumping genes” that were discovered by Barbara McClintock in maize in 1948, for which she was awarded a Nobel Prize. These TEs can be harmful to the integrity of the genome by disrupting genes through insertion as well as effecting the expression of other genes near or in which they reside. This is where DNA methylation comes into play—methylation is a mechanism that the organism can use to defend against harmful TE insertions by silencing the DNA that codes for that particular TE. My project specifically involved detection of these new TE insertions and checking to see if and when the plant will silence these potentially harmful insertions.

Apart from working in lab full time during the weekdays, I utilized my weeknights and weekends to explore numerous must-see sights in Paris as well as some not so well known locations. Paris is home to the world famous Eiffel Tower, Notre Dame Cathedral, Arc de Triomphe, Avenue des Champs-Élysées, Sacré-Cœur Basilica, and of course the Louvre. Some of these sites were within walking distance from work, while others were only a short ride away on the busy Paris metro. I was very fortunate to be in Paris during the French Independence Day on July 14th, also known as Bastille Day. From watching the military parade down the Champs-Élysées in the rain to the stunning fireworks at the Eiffel Tower at night, it was an unforgettable celebration! I was also fortunate enough to be standing near the finish line of the famous Tour de France!

After living in Paris for 11 weeks, there were definitely moments when I felt Parisian—especially during those times when I would walk to the local bakery and buy my daily baguette and pastries, or when I sat at a café sipping on my espresso. It was a summer filled with adventure and learning, both in life and in science. I am forever grateful to Dr. Vincent Colot, my mentor in Paris, and Dr. Vicki Chandler, my mentor at the University of Arizona. I would also like to thank Carol Bender, Christine Duddleston, and the BRAVO! Program. I would like to recognize funding from HHMI (52005889) and the BRAVO! Program for providing this once in a lifetime experience.



## Study Abroad in Africa

from Biochemistry undergraduates Aubri Carman and Kristen Bratton



“This summer we had the opportunity to participate in a Child Family Health International program in Durban, South Africa. For four weeks, we spent time at different clinical sites around the city learning about the South African healthcare system and the unique healthcare challenges in the region, including the impact of the HIV/AIDS epidemic. We began at a large teaching hospital, spending time in both the pediatric and surgical wards. We saw a variety of surgeries, including amputations and fissure repairs, and spent time with many children infected with HIV. We spent a week rotating through several rural clinics, learning about primary care, community outreach, and traditional medicine. We even were able to visit a sangoma, a Zulu *witch doctor*.

For the last week of our trip, we spent time at a smaller local hospital and were able to assist with live births, observe cesarean sections and spend time in an HIV outpatient clinic.

When we weren't busy at work, we attended World Cup games, went on safari, visited other areas of the country and enjoyed the hospitality of our homestay family, the Nxeles. The month flew by, and we can't wait to return again someday!”

## Summer in China

from Steven Smith

Tucson, Arizona recently broke the 1 million mark for population. But a visit to wildcat country during the summer months could lead to some serious head scratching about the legitimacy of such claims. It seems every year the end of the traditional academic season in May brings with it somewhat of a mass exodus out of the sweltering heat of southern Arizona that seems to markedly decrease the population of this eclectic and fun city. This summer, I was part of this exiting crowd that escaped the desert.

Through the National Science Foundations (NSF) East Asia and Pacific Summer Institutes (EAPSI) program, I spent my summer abroad, in China, not only doing research but also experiencing a different culture that is rich in tradition and history.

My goals for this summer were relatively simple: (a) get a lot of work done, (b) have a lot of fun and experience a new way of living and a new culture; and also (c) represent the United States of America in a positive fashion overseas (the last one was a specific goal of the NSF). I also wanted to learn some Chinese and learn, once and for all, how to use chopsticks.

continued ◊----->

# post cards



continued from page 21



The EAPSI summer program in China has been an incredible and very worthwhile experience. This has been, without question, the best summer in my life. The program lasted just over 2 months and there were approximately 40 American, PhD science students that were my colleagues in China this summer. Each of us

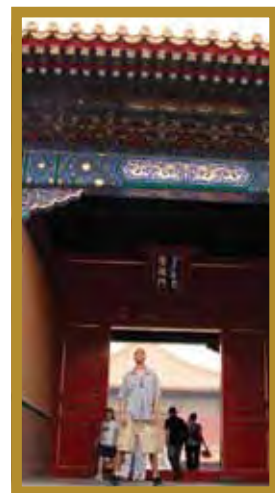
essentially joined a foreign research group for the summer and tried to fit in as best we could with our foreign collaborators, supervisors and colleagues. We all arrived in Beijing at the beginning of the summer where we stayed for one week and participated in various orientation and educational activities. The Chinese government, particularly the Ministry Of Science and Technology (China MOST), was very generous and showed us all of the sights one would expect to see while in Beijing, including the Great Wall and the Forbidden City/Tiananmen Square. We were also treated to a quite elegant Peking Duck dinner that was fantastic.

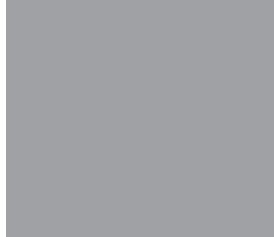
Following this first week, each of us basically went our separate ways: some remained in Beijing for the entire summer, but many, like myself, traveled to various locations across China where we would reside and work. I worked and lived in Xiamen, Fujian over the course of a completely unforgettable summer.

The quality and quantity of work I was able to get done while at Xiamen University with Professor Zhao-Xiong Xie was comparable to what could have been accomplished in the States. The facilities and access to resources while in China was surprising and very helpful. Our work with multifunctional nanoparticles for biomedical applications has seen much progress over the summer and my own familiarity and training with new synthesis and analytical techniques has also improved.

I feel like I came close to accomplishing all the goals previously mentioned (except learning the Chinese language...which proved even more difficult than quantum physical chemistry), but it would be incomplete to speak only of work when describing this summer—the rest of life in China has also been incredible. The food was, quite simply, amazing (side note: I officially now know how to use chopsticks!!). And the prices for everything in China, combined with the exchange rate, allowed my meager US graduate student salary to actually provide me quite a comfortable standard of living this summer.

Overall, although I am definitely a big fan of Tucson, it was quite an experience to be on the other side of the world for a few months this summer while avoiding the scorching desert heat. It's great to be back in the USA, but I definitely plan to make a return trip to the Far East in the very near future.





## Rain, Music, and Feet

Ersilia Anghel reporting from  
Manchester Metropolitan University



This summer BRAVO! sent me to a world filled with world-class research, unbelievable live music, hip street fashion, and endless tea breaks.

The Biology Research Abroad-Vistas Open program gave me the opportunity to extend my work with Dr. David Armstrong and Dr. Ron Heimark in the Department of Surgery at the UA to a dynamic collaboration with Professor Andrew Boulton and Dr. Frank Bowling at University of Manchester, and Professor Valerie Edwards-Jones at Manchester Metropolitan University. There I studied the microbiology of Diabetic Foot Ulcers (DFUs) infected with MRSA and other bacteria during different therapies.

Having worked with DFUs at the UA, I knew they were nasty and that held true overseas. While in Manchester, I learned microbiological techniques that I had never used in my research lab before. With only 3 months to spend in the program in Manchester I was motivated to learn skills quickly and work closely with senior staff. I was always challenged by the professors to do more and by the end of the summer I had worked on three completely distinct studies.

The city is flooded with young people while school is in session and they are all very open and accessible. What do these students do? They spend time, as I did, in quirky, indie cafes and bars listening to the unheard of bands or going on pilgrimages to music festivals around the country.

Back in Tucson, I still keep in touch with my lab and clinical staff weekly. I've asked a few of them to visit Arizona for my graduation and I can't wait to see them again! Living on my own in Manchester, working each day, taught me a lot about science, people (British, Asian, and French especially), and myself. I cannot thank everyone enough who was involved in this program!



# testimonials



## Linda Mobula ◦-->

BS Biochemistry & Molecular Biophysics, Class of 2004, Michael Wells Group  
Outstanding Senior for Biochemistry & Molecular Biophysics

“I am currently completing Residency in Internal Medicine at Johns Hopkins Bayview. I obtained my Medical Degree from UCSF School of Medicine with an area of concentration in Global Health. As part of my thesis project for medical school, I worked with the Kinshasa School of Public Health, studying the prevalence of antimalarial resistance markers in Kinshasa, Dem Rep of the Congo. I also had the opportunity to travel to Haiti in August with Samaritan’s Purse. I provided medical care to many Haitians that have been affected by the earthquake while working at Cité Soleil Clinic, which is in one of the most dangerous neighborhoods of Port-au-Prince. This was a very rewarding experience for me. I was able to see for myself the consequences of the earthquake and visited orphanages and shelters while I was there. I am also serving on the Diversity Council in the Department of Medicine at Johns Hopkins which is dedicated to making Johns Hopkins a more diverse environment. While I was at the UofA, I majored in Biochemistry and was part of UBRP and the MARC program, where I worked for Dr. Michael Wells. Dr. Wells was an inspiration to me and encouraged me to pursue my dreams. Though he passed away a few years ago, his legacy continues to live through the many students he has mentored.”



## Rachel Zenuk, MPH ◦-->

BS Biochemistry & Molecular Biophysics/Molecular Cellular Biology, 2008,  
John Pollard group

Susan G. Komen Fellow, Cancer Health Disparities Institute, Arizona Cancer Center

“What really sets the Department of Chemistry and Biochemistry apart is student support. The resources available to undergraduate majors are unmatched by any other department—as an undergraduate Biochemistry major, I received one-on-one faculty mentoring, hands-on lab experience, access to tutoring, professional seminars and clubs, as well as scholarship support. As an undergraduate, I began working on the ELLA Study, a binational breast cancer study profiling risk factors in Hispanic women in the U.S. and Mexico. This experience has allowed me to work alongside top-notch researchers, physicians, and other health professionals at the Arizona Cancer Center, M.D. Anderson Cancer Center, Universidad de Sonora, Instituto Tecnológico de Sonora, and Universidad de Guadalajara, and several community health centers.

The CBC Department opened my eyes to a multitude of career opportunities for science majors. In 2010 I earned my Master of Public Health degree from the Mel and Enid Zuckerman College of Public Health. Public Health is a diverse field; because of my research training as an undergraduate, I have been able to excel in areas where others without basic science experience struggle. Now I am looking forward to the next chapter of my life—attending medical school!”





## Erin Palmer

MS Science Education, 2008, Victor Hruby group

New York City Teaching Fellow

Chemistry Teacher, Bronx Expeditionary Learning High School

“Upon graduation with a degree in Biochemistry from the UA, I joined the NYC Teaching Fellows, a program dedicated to recruiting and training highly-qualified teachers who will work to close the achievement gap in New York City classrooms. For the past two years I have taught chemistry in the South Bronx while earning my MS degree in Science Education. My experiences as a teacher have been both challenging and inspiring. Every day I have the opportunity to share my passion for science with students in underprivileged communities making chemistry accessible, fun and challenging. Designing and implementing new chemistry curricula in my classroom has cultivated in me a strong interest in the field of teaching and learning biochemistry. In the future I plan to return to graduate school where I can continue my study of biochemistry and biochemistry education.

My experiences and relationships with faculty at the UA have been instrumental in guiding my decisions to enter the field of science teaching and learning. During my time as an undergraduate my professors exhibited an exuberant passion for both biochemistry research and the education of biochemistry, and they continue to serve as mentors for me as I pursue future goals.”

## Emily Ricq

UA Class of 2009

BS Chemistry, Fall 2009, Robin Polt group

CBC & College of Science Outstanding Senior

“A bachelor’s degree from the Department of Chemistry and Biochemistry (CBC) can be a stepping stone to a vast number of career paths, including medicine, research in both academic and industrial settings, and science education, to name only a few. Deciding which path to pursue can be a daunting process which, in my opinion, is best approached through trial and error. Fortunately, one of the University of Arizona’s greatest strengths is the breadth of opportunities available to undergraduates.

Like many of my peers, I arrived at the UofA with a strong interest in medicine. I took my advisor’s advice and, in addition to volunteering at local hospitals, I joined Dr. Leslie Tolbert’s lab in the Department of Neuroscience. I quickly fell in love with research, particularly the use of chemistry to answer biological questions. Because of the interdisciplinary spirit of research at the UA, I was able to extend my research to a joint project with the Robin Polt lab in the Department of CBC and try my hand at both cell culture and organic synthesis. With the support of my instructors and advisors, I further broadened my research with an industry internship at Sanofi-Aventis and by researching abroad at l’Université Pierre et Marie Curie in Paris, France. Finally, after earning my B.S. in Chemistry in December of 2009, I spent a semester teaching 1st through 6th grade science at Agua Caliente Elementary School. I believe that majoring in the sciences boils down to asking questions and testing your ideas; the UA is a wonderful place to experiment with your career options and discover the path that best suits you. I chose to continue researching, and am currently a first year graduate student in the Department of Chemistry and Chemical Biology at Harvard University.”

# student recognition



## Undergraduate Awards

Dario Pasalic CBC & Biochemistry  
Outstanding Senior, Spring 2010

Keeper Sharkey CBC & Chemistry Excellence  
in Undergraduate Research, Spring 2010

Erin Acino Biochemistry Excellence in  
Undergraduate Research, Spring 2010

Zachary Urdang Chemistry Outstanding  
Senior, Spring 2010

Natalie Pace Biochemistry Outstanding  
Senior, Fall 2009

Emily Ricq Chemistry Outstanding Senior,  
Fall 2009

Joy Meserve Biochemistry Outstanding  
Undergraduate Thesis 2010

### Michael A. Wells Memorial Research Scholars 2010

Ersilia Anghel	Laurel Kartchner
Aeen Asghar	Mounir Koussa
Samantha Bomotti	Nina Martin
David Chen	Meytal Shtayer
Sarah Edwards	

### Barry M. Goldwater Scholars 2010

Troy Comi	Beryl Jones
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## Graduate Awards

### College of Science Outstanding Graduate Student Awards 2010

#### Biochemistry

Daniel Martinez COS Outstanding TA

Reid McCarty Scholar

Sam Jayakanthan Service

#### Chemistry

Karen Christian Outstanding TA

Emily Tenenbaum COS Scholar

Janie Salmon Service

### John Hostetter Scholar 2009

Katherine White Hope

David F. O'Brien Graduate  
Fellowship 2010

Lindsay Zack

### Proctor & Gamble Scholars 2009

Benjamin Heitz

Ashley Gucinski

Angela Soemo

Michele Pavanello

Jennifer Furman

### Wayne L. Cody Scholar 2010

Marvel Scholarship & Research  
Endowment

Erin Johnson Kaleta



## Special Recognition

### ARCS Foundation Scholarship 2010

Logan Ahlstrom  
Judith Jenkins

### Mathematical Modeling of Biomedical Systems Predoctoral Trainees 2010 - 2011

Logan Ahlstrom  
Ian Borukhovich

### BCP NIH Training Grant Fellows 2010–2011

Katie Holso                      Rebecca Johnson  
Reid McCarty                  Breland Smith

### UACG Graduate Student Research Symposium, 2nd place presenter award 2010 and TRIF Imaging Program Fellow 2009

Jennifer Furman

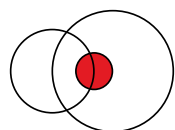
### NSF Foundation IGERT Fellow

Zachary Miles

### Outstanding Student Poster Award, ACS Physical Chemistry Division 2010

Olga Griffith

## Graduate & Undergraduate Awards



### The Galileo Circle

#### Galileo Circle Scholars 2010 (and sponsors)

David Briggs  
**Thomas and Cande Grogan**

Jessie Brown  
Dario Pasalic  
**Nick Soloway**

Alec Coffman  
Kurt Cox  
**John and Helen Schaefer**

Sarah Edwards  
**Kirtland and Nancy Gardner**

Robert González  
**BBVA Compass/Mark and Kathy Mistler**

Allena Goren  
Justin Mauser  
Joy Meserve  
Andrew Tseng  
**Research Corporation for Science  
Advancement/James and Glenda Gentile**

Ashley Gucinski  
**Ghislaine Polak**

Forrest Helfrich  
Anne Simon  
**James and Sharon Akridge**

Benjamin Jester  
**Lee and Vera Jones**

Mounir Koussa  
**Jeffrey and Shelle Owen**

Nick Wiebelhaus  
**Charles and Betty Leftault**

**Gilbert R. Escalante Memorial  
Galileo Circle Scholar 2010**

Mary- Helen Wanat  
**Delia Escalante and Frank  
Escalante**

**Lela E. Booher Memorial  
Scholar 2010**

Andrea Hartzell  
Zachary Miles

## events & outreach



### 2010 Department BBQ

CBC hosts an on-campus BBQ for undergraduate majors and their families each fall. It was beautiful night for this event, which was scheduled to coincide with Family Weekend.

The event was well attended by the CBC faculty, CBC undergraduates and graduate students, along with their families. Our CBC student ambassadors helped set up for the event and were great at hosting throughout the evening.

The Department found that making the event open to parents created an excellent atmosphere in which the parents enjoyed the opportunity to meet faculty, staff and other students and show interest in their child's education at a large university. At the event faculty spent considerable time focusing on interactions with their students and in educating the parents about what the Department and the UA have to offer the student.

The primary focus of this event is to promote retention of undergraduates, especially freshmen, and to foster their interaction with upperclassmen. This provides an excellent opportunity for freshmen and sophomores to learn about UA opportunities related to Chemistry & Biochemistry as well as to discuss graduate school as a future option for their further training.



### Summer Interactive Games

Before the semester began, the CBC had one last summer hurrah with its Summer Interactive Games. About 100 faculty and staff members gathered on the UA Mall on August 16 for games of tug-of-war, three-legged races, a daring water balloon toss (with participation by President Robert N. Shelton) and more. The event was held in honor of the one-year anniversary of the merger of the University of Arizona's Chemistry and Biochemistry departments. Winners were awarded towels appropriately stamped with a copy of the periodic table of elements.



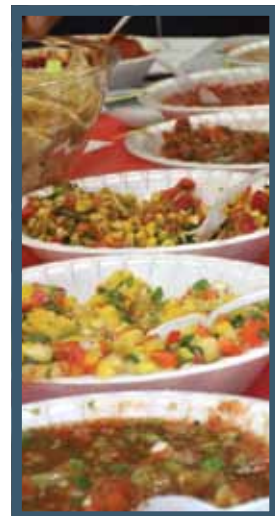


## Salsa Challenge

The Salsa Challenge had a wonderful turnout. Thank you for joining the party and many thanks to all those that entered. Also, a big thank you to the folks that helped set up and break down for this event! Get ready for next year!

Congratulations to the 2010 Salsa Challenge Winners: Original 1st place **Beth Vinson**, 2nd place **Bryn Stotler**, 3rd place **Andy Hausrath**; Traditional 1st place **Olivia Mendoza**, 2nd place **Charlotte Honeycutt**, 3rd place **Bryn Stotler**.

Entries came from Jacquie Brailey, Delight Craddock, Gabby Molnar, Ian Jones, Bryn Stotler (2 entries), Vince Leon, Olivia Mendoza (2 entries), Rachel Miller, Beverly Travers, Beth Vinson, Talisha Mottinger, Jennifer Sanchez, Andy Hausrath, Irene Barriga, Vahe Bandarian, Abreeza Zegeer, Megan McEvoy and Charlotte Honeycutt. Pictures can be found on Facebook at Chembioc Dept



## Peer Mentoring Meet and Greet

The first Catalyst (CBC student peer mentor program) event of the semester was the ice cream social on Thursday, September 2nd. For many of us, it was the first time meeting our “mentees” or mentors on the BSW patio. It was very relaxed and fun as new students and old students mingled with each other and a few professors. The new chemistry and biochemistry students had the opportunity to sign up for a visit to a mentor’s lab, which was very popular. We are all looking forward to the next social event!

## CBC Commencement Brunch

The CBC Department proudly hosts a yearly brunch to celebrate graduation, honor award and scholarship recipients, and thank the CBC student ambassadors for their contributions to the Department. CBC invites families, faculty, and friends of the Department to come together and celebrate at this event

This year it was a well attended event. The program consisted of Dr. Mark Smith, Chair of CBC, welcoming everyone to the event, followed by the Keynote speaker, Thomas M. Grogan, M.D. Professor of Pathology and Founder and Chief Scientific Advisor of Ventana Medical Systems. Dr. Grogan’s topic was *The Ventana Medical Story: Chemistry from University to Wall Street and Beyond*. Following his talk, Drs. Vicki Wysocki and Mark Smith presented Graduate and Undergraduate Awards and Dr. James Hazzard presented the Michael A. Wells Memorial Scholars. Dr. Joaquin Ruiz, Dean of the College of Science presented the Galileo Circle Scholars. The closing remarks were given by Dario Pasalic, the CBC Outstanding Senior.



○ **A Flash in Time: A Celebration of the Scientific Career and Contributions of Regents' Professor Gordon Tollin**

On March 11 and 12, 2011, the Department of Chemistry and Biochemistry will host a two-day celebration for one of its most respected and honored faculty members, Regents' Professor Gordon Tollin. Professor Tollin, who is now officially retired, though still very active in his laboratory and research efforts, began his tenure in the Department of Chemistry at the University of Arizona in 1959, after having been a graduate student under the legendary Sidney W. Fox at Iowa State University and a post-doctoral fellow for the Nobel Laureate Melvin Calvin at UC Berkeley.



In the five decades that he has been at the UA, Gordon has established himself as a scientist held in the highest esteem by his students, colleagues, and collaborators who are located around the world. Never being content to take on easy problems, Professor Tollin has been a pioneer in many areas of biological energy conversion, most notably his contributions made to understanding both inter- and intra-molecular biological electron transfer reactions studied by stopped-flow and laser flash photolysis technologies and most recently to understanding the structure-function relationships of membrane bound and associated proteins first using surface plasmon and plasmon waveguide resonance.

The immense scope and breadth of systems that Professor Tollin has studied over the years, resulting in over 300 publications, will be highlighted during this celebration beginning with a seminar given by a former graduate student, Dale Edmondson, who is a Professor at Emory University and a AAAS Fellow, on Friday March 11 as part of the Department's Biochemistry Colloquium Series. A reception and dinner at the Four Points Hotel near the UA campus will be held later that evening.

Talks by former students, post-docs, colleagues, and collaborators will be presented on Saturday, March 12 beginning at 9 a.m. in the Koffler Building on the UA campus.

Please join us in celebrating the remarkable achievements and contributions that Professor Tollin has made during his career on this weekend. More information can be obtained from Dr. James T. Hazzard ([jhazzard@email.arizona.edu](mailto:jhazzard@email.arizona.edu)) or Ms. Ellie Warder ([warder@email.arizona.edu](mailto:warder@email.arizona.edu)).



## Creating a Community of Talent

A great institution and its demands are constantly changing. In order for the Chemistry and Biochemistry Department to continue to attract the nation's top faculty and students we need to continue to provide scholarships, endowed chair position and financial support for the facilities and equipment.

Through the years, we have witnessed the power of donors coming together and supporting the department through their philanthropy and engagement with faculty and students. Today, our community needs to continue to strengthen the Chemistry and Biochemistry experience to ensure the growth and sustainability of our students.

Our faculty and staff believe there are few rewards greater than working to enhance the academic program of our students so that they can capitalize on the living and learning opportunities that arise from access, quality and discovery of this great University. Our alumni, parents and friends play a big role in creating those opportunities, and we value your support and commitment.

To support UA CBC students by making a donation, send checks payable to **The University of Arizona Foundation** to:

Department of Chemistry & Biochemistry

Attn: Ms. Ellie Warder

The University of Arizona

PO Box 210088

Tucson, AZ 85721-0088

Or donate [online](#)

When you pay online by credit card, no fees are taken out; your full donation goes directly to CBC programs.

When making a gift to CBC you may direct your donation to specific programs like those listed or allow us to use the money where it is most needed.

**Thank you for your support! Your contributions are tax deductible.**

### Departmental

CBC Department Development  
Graduate Recruitment  
Undergraduate Support  
Dr. Harold McNair Staff Awards

### Faculty Support and Endowed Chairs

John P. & Helen Schaefer Endowed Chair  
Dr. Homer & Dr. Emily Weed Endowed Chair  
Unrestricted Faculty Support

### Lectureships

Homer & Emily Weed Endowed Lectureship  
Robert Davis Biochemistry Lectureship  
Galileo Circle (minimum \$1,500.00)

### Scholarships/Fellowships

Michael A. Wells Undergraduate Research Scholarship\*  
David O'Brien Memorial Scholarship  
Thalacker Graduate Fellowship  
Carl Marvel Scholarship & Research Endowment  
Wayne Cody Medical Biological Chemistry Student Scholarships  
Michael A. Cusanovich, Endowment for Undergraduate & Graduate Scholarships  
Ernest H. Polak Biological Sciences Scholarship  
Hruby Symposium Fellowship  
Herb Carter Award\*  
Lela Booher Memorial Scholarship\*  
Bio Science Excellence Awards for Undergraduates  
CBC Excellence and CBC Outstanding Research Awards  
CBC Graduate Scholarships  
CBC Undergraduate Scholarships  
\* make checks payable to University of Arizona

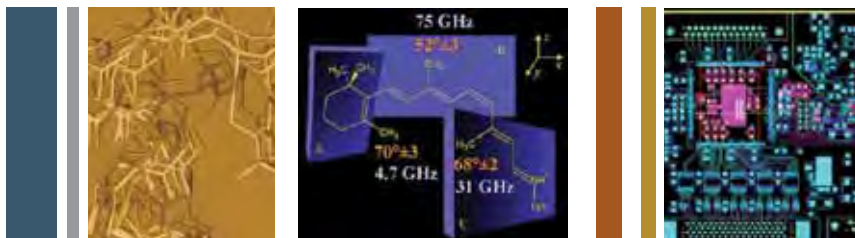


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## chemistry & biochemistry alumni association

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## Mark Your Calendar!

Please help your Department by considering joining the team of **Alumni Ambassadors**. This valuable team will be contacting their peer alumni to help identify and recruit assistance in advancing the Department. If you are interested and wish more information please contact Ellie Warder at [warder@email.arizona.edu](mailto:warder@email.arizona.edu)

**Write to us!** Share stories about what you have been doing since graduating, or your fondest memories of UA and Tucson life. Please contact Ellie Warder at [warder@email.arizona.edu](mailto:warder@email.arizona.edu) if your mailing address changes or if you wish to receive the alumni newsletter in electronic form.

Join the CBC Alumni or the Chembioc Facebook pages to stay current with CBC news!

**Pittcon CBC Reception March 14, 2011 from 5:30–7:30PM at the Hilton Atlanta, Atlanta, GA**

**Host: Bonner Denton**

**American Chemical Society (ACS) Conference**

**CBC Reception March 28, 2011 Anaheim, CA**

**Host: Anne Padias**

**American Society for Biochemistry & Molecular Biology (ASBMB)**

**CBC Reception April 11, 2011 Washington, DC**

**Host: Vahe Bandarian**

**Note:** Above dates are tentative. Please check [here](#) for confirmed dates.