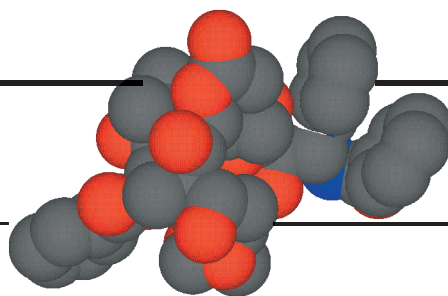


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Vol. X, No. 2

MISSOURI STATE UNIVERSITY

Spring, 2007

## Meet An Outstanding Alumnus

The first student to graduate from Missouri State University (then Southwest Missouri State College) with a perfect 4.0 grade point average was Dr. Dorothy (Martin) Simon (class of 1940). It would be 24 years later before another student would graduate with a 4.0 GPA. Following graduation, from Missouri State University, Dr. Simon went on to earn her Doctor of Philosophy degree in Physical Chemistry from the University of Illinois. She followed this with post-doctoral study at Cambridge University in England. Dorothy was the daughter of Robert M. Martin, the head of the science department at Southwest Missouri State University until his retirement in 1960. "I was born into science. I knew the word chemistry before I learned to walk."

Dr. Simon's first position was at DuPont where she helped develop the synthetic fiber "Orlon". She then took a position at the Oak Ridge National Laboratory where she conducted experiments on triple fission and isolated a new isotope of calcium. When she later worked at the Lewis Laboratory of NASA, she earned an international reputation for her research on combustion.

In 1956 Dr. Simon accepted a position at Avco, a 1.3 billion high technology corporation. In 1968 she became the first woman corporate officer of the company when she was promoted to the position of Vice President of Research. In this capacity, she was responsible for guiding the research and development efforts of eight divisions in such diverse areas as lasers, power generation, remote sensing, and spacecraft reentry. Specific projects included the development of the gas turbine engine used in U.S. army tanks, the development of electronic control systems for aircraft engines, as well as the development of high temperature composite materials for use in aircraft. Dr. Simon retired in 1985 and founded the consulting firm Simon Associates.

Dr. Simon has been awarded many honors during her career, including the highly prized "Achievement Award" from the Society of Women Engineers. She has also been honored with the Rockefeller Public Service Award, and in 1976 was named by Business Week as one of the top 100 corporate women in America. Dr. Simon received an honorary Doctor of Science degree from Worcester Polytechnic Institute in 1971 and an honorary Doctor of Engineering degree from Leigh University in 1978. She was named an "Outstanding Alumnus" in 1958 by the SMS Alumni Association, and was the winner of the Greenwood Laboratory School Outstanding Alumni Award in 1993.

When asked recently about her career in what was then a male dominated field, she said, "It was and it wasn't hard to succeed in a man's world. Act as though barriers are not there, because there is always a way around them."

Dr. Simon recently established an endowed scholarship fund (the Dr. Robert W. Martin Research Fellowship) in honor of her father. The scholarship will be awarded to junior or senior chemistry majors who plan to pursue graduate studies at Missouri State University. Dr. Simon currently resides in North Carolina.

## NOTE FROM THE HEAD - Dr. Paul Toom

Working with a faculty task force, the Provost's office identified eleven interdisciplinary research areas to be considered for additional University support. The Chemistry Department will play a major role in four of these emphasis areas, specifically (1) Biotechnology, (2) Environment and Water Resources, (3) Materials Science and (4) Research on Learning, Teaching, and Intervention.

In response to a call for proposals, the Chemistry Department submitted a proposal addressing departmental needs in the areas of Biotechnology and Materials Science and worked with the Department of Physics in developing a second proposal in the area of Materials Science. Both proposals were funded!

Funds from the Provost's office, together with matching funds from CASE, CNAS, and the departments of Physics and Chemistry will establish an X-Ray instrumentation facility. Specifically, we will be purchasing two X-Ray Diffraction instruments. One instrument will be equipped for single crystal characterization, the second will be used for thin film and powder studies.

The \$265,000 awarded to the Chemistry Department will provide funding of a faculty line for a new biochemist whose research interests are in nucleic acid chemistry with applications to material science. Funds will also be available to renovate some badly needed research space in the department, in addition to purchasing instrumentation appropriate for nucleic acid research.

## FACULTY NEWS

**Dr. Eric Bosch** had a paper published entitled, "Chain-link Hydrogen-bonded Capsules," *CrystEngComm*, 2007, 191-198.

**Dr. Reza Herati** co-authored a paper with C. N. N'soukpie'-Kossi, C. Ragi, S. Hotchandani and H. A. Tajmir-Riahi entitled, "Retinol and Retinoic Acid Bind Human Serum Albumin: Stability and Structural Features," *International Journal of Biological Macromolecules*, 2007, 40, 484.

**Dr. Gary Meints**, co-authored the following two papers: (1) P. A. Miller, Z. Shajani, G. A. Meints, D. Caplow, G. Goobes, G. Varani, and G. P. Drobny, "Contrasting Views of the Internal Dynamics of the HhaI Methyltransferase Target DNA Reported by Solution and Solid-State NMR Spectroscopy," *J. Am. Chem. Soc.*, 2006, 128, 15970-15971. (2) J. Mao, S. Mukherjee, Y. Zhang, R. Cao, J. M. Sanders, Y. Song, Y. Zhang, G. A. Meints, Y. G. Gao, D. Mukkamala, M. P. Hudock, and E. Oldfield, "A Solid State NMR, Crystallographic and Computational Investigation of Bisphosphonates and Farnesyl Diphosphate Synthase-Bisphosphonate

Complexes," *J. Am. Chem. Soc.*, 2006, 128, 14485-14497. Dr. Meints and his wife Michelle became the proud parents of Carter Meints in November.

**Dr. Mark Richter** co-authored a paper with D. J. Vinyard and S. Swavey, "Photoluminescence and Electrogenated Chemiluminescence of a Bis(bipyridyl) Ruthenium(II)-Porphyrin Complex," *Inorganica Chimica Acta*, 2007, 360, 1529-1534.

**Dr. Chad Stearman** has joined the department as an Assistant Professor after serving as Visiting Assistant Professor in 2006. His current research interests are centered on organic chemistry and synthetic methods development with applications in materials science. He recently received a Missouri State University Faculty Research Grant to investigate novel methods for the synthesis of perylene bisimide derivatives and their resulting optical/electronic properties. He has also been awarded a grant through the Center of Applied Science and Engineering for his work in the area of organic microelectronics. On a personal note, Chad and his wife Ridley, along with their three-year-old son Hayden, welcomed a daughter, Ella Sabine, in September.

**Dr. Adam Wanekaya** received a Missouri State University Summer Faculty Fellowship for 2007 for the project, "Towards Conducting Polymer Nanowire Biosensors," \$5,000. He co-authored a paper with M. A. Bangar, M. Yun, W. Chen, N. V. Myung and A. Mulchandani, "Field-Effect Transistors Based on Single Nanowires of Conducting Polymers," *J. Phys. Chem. C.*, 2007, 111, 5218-5221.

**Dr. James Zimmerman** received two grants: "Improving External Perceptions: Upgrading Recruitment Materials and Departmental Website," Graduate Student Recruitment Initiative (GSRI), Office of the Provost, Missouri State University, \$2500; J. A. Zimmerman and D. M. Duitsman, "Missouri Department of Health and Senior Services -- Emergency Response Exercise Evaluation Project - Kansas City," State of Missouri Department of Health and Senior Services, \$144,581.

## Spring 2007 Missouri State University Faculty Research Grant Awards

**Dr. Richard Biagioni**, "PowerPoint Previews and Prelabs for the CHM 175 Laboratory," in the amount of \$4,156.

**Dr. Dean Cuebas**, "The  $\beta$ -Oxidative Metabolism of Naturally-Occurring Conjugated Trans Fatty Acids from Ruminant Meat and Milk Products," in the amount of \$7,472.

**Dr. Nikolay Gerasimchuk**, "Electrochemical Studies of Novel Nano-sized Cytotoxic Bivalent Pt (II) Complexes," in the amount of \$6,490.

**Dr. Chad Stearman**, "Development of Novel Methods for the Synthesis and Study of Perylene Bisimide Derivatives," in the amount of \$7,319.

### OUTSTANDING FACULTY ACHIEVEMENT

**Dr. Mark Richter** is one of the first three recipients of the **Young Honors College Professorship** at Missouri State University. The Professorships were established due to a gift commitment from Rich and Doris Young, and will provide a \$5,000 annual stipend for a term of up to three years. Dr. Richter plans to develop a second honor's chemistry course, help students look for fellowship/scholarship opportunities and seek out honors students to assist with research opportunities.

### CHANGING UNIVERSITY TIMES

*by Mark Richter  
Associate Professor of  
Chemistry and Outgoing  
Faculty Senate Chair*



With the arrival of President Nietzel in June of 2005, this seemingly quiet campus has undergone a moderate to significant upheaval. To use an analogy, we have gone from geological to warp speed in no time at all. Energetic, enthusiastic and with a vision of where Missouri State University can go, the President is implementing numerous initiatives at the University, College and Department levels. Perhaps the most significant from the point of view of Faculty and Staff is a performance-based compensation system. This requires a significant culture change on campus, and the past year has been spent devising criteria on which individuals will be evaluated, on the processes by which decisions are made and holding individuals accountable for those decisions. There has also been a heavy emphasis on transparency at all levels, another culture change from the past.

One of the biggest challenges of a higher education institution in Missouri is that the state ranks 46th when compared to other states in per capita funding of higher education. It ranks 50th in the amount of funds appropriated for higher education the past 2-years. If the Governor's proposed budget is passed, Missouri State University will have state appropriations at roughly the 2001 budget level, the point at which significant cuts to state institutions started. Clearly, higher education is not a priority. However, now that the name change years are behind us, Missouri State and the University of Missouri system are talking to one another, and the Presidents of the 13-public four year institutions are working together


to bring the message of how important college education is to individuals and society to the citizens of the state and legislators.

Other initiatives on campus include an emphasis on academics, including an increase in Endowed Chairs and Professorships (so if you happen to have some money lying around...), and moving to a Cost Center Model where as many decisions as possible are made at the Department and College level rather than centrally. There is also a push to increase the visibility of the Public Affairs Mission, to increase diversity on campus, and to ramp up research so that individuals and the University are more competitive for federal and private research funding. Research in the sciences is vital to provide students with the skills they will need to be successful in a rapidly changing and technology oriented world. A greater ability to conduct research, as well as more time for faculty to spend with students in the research lab, will help the Chemistry Department provide stronger undergraduate and graduate learning experiences. The University's Long Range Plan discusses many of these issues and can be found at <http://www.missouristate.edu/longrangeplan>. Please pay special attention to Chapter III on incubating new ideas. The section on research is especially thoughtful and well written (and fortunately doesn't list the authors). Dr. McCarthy, who arrived on campus as our new Provost in June of 2006, has outlined several other initiatives (<http://www.missouristate.edu/provost>), including the Provost's Research Incentive Awards to promote innovative, multi-year and broad based research programs. The Chemistry Department has benefited from this program in both material science and biotechnology. The strength of the Chemistry Department is repeatedly recognized on campus, and the Department is positioned to be a leader in the coming years.

At the Faculty Senate level we have been heavily involved in revising the Faculty Handbook, in strengthening and evaluating the MSU curriculum, in gauging Faculty Morale, and in evaluating administrators. The Chair of the Senate is also the Faculty's voice to the Provost, President and Board of Governors, and as such is integrally involved in major decisions that occur at the University level. Being Chair of the Faculty Senate has been a rewarding and, at times, frustrating experience, with an emphasis on the former. I am glad I had this opportunity to serve the University in this manner, and grateful to my colleagues across campus for giving me this chance to serve them. However, by the time this appears in print I will once again be back to what I love most--teaching, research, performing chemical magic shows for people of all ages, and interacting with great colleagues and students. And making chemicals glow, of course.

## WATER ANALYSES AND OEWRI

by *Richard Biagioni*



Over the past several years, I have worked with a variety of collaborators in the College of Natural and Applied Sciences on environmental water projects. My first major involvement involved a project with Dr. Bob Pavlowsky and Dr. Rex Cammack (both of Geography, Geology, and Planning) and Dr. John Havel (Biology) on a TMDL (Total Daily Maximum Load) study of the James River sponsored by the Missouri DNR and EPA. This was a three-year study in which we collected samples at a dozen sites weekly from late spring through early fall and analyzed them for a wide variety of water quality parameters. We were able to document trends in pollution levels – especially for phosphate and nitrate – and correlate those to measures of water quality such as algae growth. My main role in the project was to stay in the lab (I only got out to the streams a couple of times!) and handle the chemical analyses. It proved to be a good opportunity for me to learn about a wide variety of applied analyses (phosphate, chlorophyll, various forms of nitrogen, BOD, and a few others) and also what was involved in making results “official” (SOPs, QA/QCs, and a bunch of other letters).

As the TMDL study wound down, I kept a hand in water projects, directing both my own students and students working for other faculty outside the Chemistry Department. For example, one of my graduate students (Mary Krause) was involved in a baseline study of water quality (particularly looking for changes in nutrient concentrations associated with runoff during storm events) of Jordan Creek, sponsored by the US Army Corp of Engineers and the City of Springfield prior to some planned overhaul of the creek’s watershed area.

A few years ago, the Ozarks Environmental Water Research Institute (OEWRI) was formed (spearheaded by Pavlowsky in GGP). This is an umbrella organization for CNAS water projects, enabling researchers involved in a variety of projects to carry out their studies using common methods and instrumentation, and helping MSU to attract external contracts and grants. My primary role in OEWRI has been to participate in establishing operating and QA/QC procedures and to be the “troubleshooter” when methods are not working.

## SURF

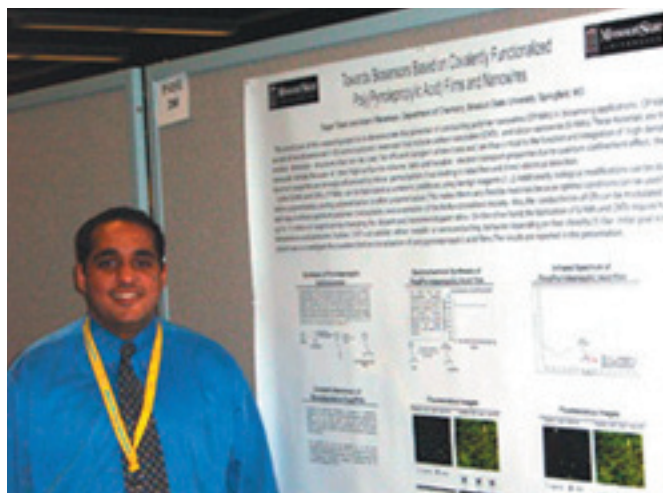
The first Summer Undergraduate Research Fellowship (SURF) program sponsored by the Chemistry Department Board of Advisors is off to a great start. Undergraduates

from the states of Arkansas, Iowa, Indiana, Louisiana, and Missouri applied for this 8 week research experience. With an average grade point of 3.7 (two applicants had perfect 4.0 GPAs), the selection committee had a difficult time selecting this year’s recipients. After much debate, however, the winners were selected and are expected to arrive on campus to start the program on June 11.

The purpose of the program is to provide participants a research experience not normally available in many area colleges while providing hands-on experience with instrumentation typically not available to undergraduate students. The program will strengthen relationships with area colleges and universities while creating a pool of potential graduate students for the department.

Funds for this first year are coming from money in the Chemistry Department Board of Advisors Foundation account. To ensure continuation of the program, the Chemistry Board of Advisors has created an endowed account with the Missouri State Foundation. The Board plans to initiate a fund raising drive this spring to fully fund this endowment, so expect a phone call and or mailing from the board in the next few months!!

## GRADUATE STUDENT NEWS



*Sagar Tolani*

Sagar Tolani presented a paper entitled, “Towards Biosensors Based on Covalently Functionalized Poly(Pyrrolepropyic Acid) Nanowires,” co-authored with Dr. Adam Wanekaya, at the ACS National Meeting in Chicago, IL, in March. He also presented his work at the 14th Graduate Interdisciplinary Forum on the Missouri State campus on April 14, 2007.

David Vinyard presented, “Light Emission From the Lithium Salts of 8-hydroxyquinoline and 2-methyl-8-hydroxyquinoline,” at the 14th Graduate Interdisciplinary Forum, Missouri State University, April 14, 2007.

## NEW SCHOLARSHIPS

The department is pleased to announce three new scholarships for undergraduate students.

Dr. Jerry Atwood (BS '63), Curators' Professor and Chair of the Chemistry Department at the University of Missouri-Columbia, has established the William J. Husa Scholarship for upperclassmen pursuing a degree in chemistry.

Dr. Dorothy Martin Simon has established the Dr. Robert W. Martin Research Fellowship (described in more detail on page 1).

The Chemistry Department Board of Advisors Summer Undergraduate Research Fellowship has been established and is described in more detail on page 4.

## ALUMNI NEWS

Kurt Alberty (BS '95) received his PhD in polymer chemistry from the University of Southern California in 2001 and is now Manager - Materials & Processes Electronics and Laboratories at Boeing Satellite Development Center.

Cynthia Dupureur, (BS '87) is an Associate Professor of Chemistry at the University of Missouri-St. Louis and recently returned to Missouri State to present a seminar entitled, "A Tale of Six Nuclei: Applying NMR Spectroscopy to Metallonuclease Structure and Function."



Brigitte Factor (MS '01) and her husband had a son in September of 2006.

Shanell Haney (BS '01) is Site Purchasing Manager for Archimica, Inc. in Springfield, MO.

Monica Kinde-Carson (BS '05, MS '06) is at the University of Nebraska-Lincoln working on a PhD in physical chemistry.

Stacey Klutts (BS '95) is completing a residency at Washington University School of Medicine and recently returned to the Chemistry Department to present a seminar entitled, "Biochemical and Molecular Approaches for Uncovering Transferases Involved in *Cryptococcus neoformans* Capsule Biosynthesis."



Larry Kuykendall (BS '96) is an Account Consultant for Chemical Abstract Service (ACS).

Deborah (Leon) Rossell (BS '01) is working on her PhD in Biochemistry at UCLA and hopes to graduate in the summer of 2008.

Stacy Scranton (BS '01, MS '04) is Market Sales Manager for Sasol Olefins & Surfactants.

## CHEMISTRY DONORS FOR 2006

Susan J. Anderson	Leisa Huie
Jerry Atwood	Arthur Hurtado
Lane Baker	Leif Irgens
John Bixler	Tammy & Dave Jahnke
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Matthew Harthcock	Annette Wardell
Jeanne Heitzman	Waters Corp.
Dr. & Mrs. Alexander Hover	Martha Young

## FALL 2006 GRADUATES



### BS Degree:

Edward Bolton	Aaron Momose	Brant Swiney
Patrick Casey	Kelly Moore	Crystal Tomlinson
Britni Coffey	David Petrillo	Sarah Young
Julie Matheny	Bryce Phillips	

## MARK YOUR CALENDAR

Fall events:

October 26 - Board of Advisors Meeting

October 27 - Homecoming

Visit our website:  
<http://chemistry.missouristate.edu>



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**Molecules & Moles**

The Newsletter of  
Missouri State University  
Department of Chemistry

Design and Layout: Judy Ewer  
Editors: Paul Toom and Judy Ewer

*Missouri State University is a community of people with respect for diversity. The University emphasizes the dignity and equality common to all persons and adheres to a strict nondiscrimination policy regarding the treatment of individual faculty, staff, and students. In addition, in accord with federal law and applicable Missouri statutes, the University does not discriminate on the basis of race, color, religion, sex, national origin, ancestry, age, disability, or veteran status in employment or in any program or activity offered or sponsored by the University. The University maintains a grievance procedure incorporating due process available to any person who believes he or she has been discriminated against. Missouri State University is an Equal Opportunity/Affirmative Action employer. Inquiries concerning grievance procedure, Affirmative Action Plan, or compliance with federal and state laws and guidelines should be addressed to Jana Estergard, Equal Opportunity Officer, Office of Equity and Diversity, Siceluff Hall 296, 901 South National, Springfield, Missouri, 65897, (417) 836-4252.*