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*Dr. Diana McGill
Department Chair*

Each year, chairs are asked by the dean "What departmental accomplishments would make you absolutely ecstatic next year?" My list for 2008 included items related to student success, faculty grant support for undergraduate research, and exceptional hires. The department had a great year in these areas and others, so we all have reasons to be ecstatic. This past fall, Dr. Patrick Hare joined us as only the second Physical Chemist the department has ever had. As an alumna and chair, I am so thrilled to have Dr. Hare whose wit and charm match perfectly to what we have all come to expect out of our P. Chemist. The department is continuing its changing of the guard with the hiring of two new tenure track faculty for Fall 2009. Dr. Lili Ma will be our new organic chemistry faculty. She comes to us from the Department of Pharmacology and Toxicology at the University of Texas Medical Branch in Galveston where she has been doing post-doctoral research since 2007. Dr. Kereen Monteyne comes to us from the Department of Chemistry and Biochemistry at California State University at Fullerton where she has been since 2005. Her specialty is chemical education. We feel fortunate to have been able to add these two outstanding individuals to our faculty; their profiles will be in the next Newsletter.

The chemistry faculty continue their high level of activity and success. In 2008, chemistry faculty were PIs or coPIs on a little over one million dollars in awarded external grants that will fund scholarships for underrepresented groups in science majors and support undergraduate research with funds for faculty and student stipends as well as for the purchase of additional equipment. Also in 2008, we had 44 students participate in undergraduate research with faculty; these students made over 50 presentations of their work at meetings such as the national ACS meeting, Pittcon, Kentucky Academy of Sciences, and Posters at the Capitol. We are extremely proud of these students and their faculty mentors. The enrollment in chemistry this past fall was up from the previous fall semester by a little over 9 %. With this growth in enrollment and the addition of spectacular new faculty members we are optimistic about the future of the department.

Department Direction

The year 2009 will be a busy one for the department. Several of us are working on a small grant that helps us connect community and chemistry. We will have local high school students this summer working in our labs, paired with student-mentors and working under the direction of faculty members. We will also be developing demo videos wherein current NKU students will be filmed conducting the demos. These demos will be made available to local high schools as well as NKU faculty. In the fall, we will begin to look at our curriculum as a whole to determine possible new directions that would align with the new more open-ended ACS standards that went into place this year. And of course, faculty will be extremely busy this summer in the research labs making sure they put all that grant money to good use! And as always, faculty will be busy updating their courses and lab manuals for the fall. It looks like we could have another record year for enrollment, so we will have much to do to prepare for all those labs!

Many students will get stipend support to work with faculty this summer, however some will work for course credit because of fund limitations. We are very fortunate to have a foundation account that helps fund a few students each year for faculty who have more student openings than their current grants support. This past year, in addition to supporting three student stipends, a \$4,200 DiffusIR Accessory for an FT-IR was purchased. This equipment is used by students in both the Lagadic and Bullen research groups and in our instrumental chemistry lab course. A huge thanks to all who make donations to our department. These funds support undergraduate research with stipends and new equipment.



PDF version of this newsletter is available at
<http://www.nku.edu/~chemistry/>

Department
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**Research
and
Grant
Activities**

DR. HEATHER BULLEN'S areas of research interest are in surface characterization and bioanalytical materials chemistry. Currently her research involves understanding what makes bacteria stick to surfaces and collaborative projects evaluating nanoparticles for drug delivery. This work has resulted in five manuscripts involving undergraduates. Her research is currently funded by Research Corporation, NSF, and KBRIN. It has also resulted in collaborations abroad with researchers in Mexico and Germany.

Example publication - *undergraduates

H. J. Gulley-Stahl,* W. L. Schmidt,* H. A. Bullen. "Characterization and Reactivity of Chromia Nanoparticles prepared by Urea Forced Hydrolysis" *Journal of Materials Science* **2008**, 43, 7066-7072.

DR. PATRICK M. HARE'S research into estrogen photophysics and photochemistry is getting underway, with three students having joined the lab for research in the spring. Their summer research will be supported by grants from CINSAM and start-up funding from Kentucky NSF-EPSCoR, CINSAM, and the department of chemistry. Dr. Hare has also submitted a grant with Drs. Walters and Paula to upgrade the department's fluorimeter to a picosecond time-resolved system. This would open a new realm of fast chemistry to courses and research students.

DR. KEMPTON'S and DR. PAULA'S research interests are in the area of drug design. Using a combination of experimental and computer-assisted techniques (Dr. Paula's group) as well as organic synthesis (Dr. Kempton's group), the researchers in these two groups are currently developing new inhibitors of the enzymes calcium ATPase and sodium/potassium ATPase. These novel compounds can help researchers understand the physiological roles of the enzymes they inhibit and some of them have the potential of being developed into novel agents for cancer chemotherapy. This work has already resulted in numerous peer-reviewed publications that include student co-authors; is supported by grants from KBRIN and the Research Corporation; and has received funding from CINSAM.

Example publication - *undergraduates

M. Lape*, C. Elam*, M. Versluis*, R. Kempton, and S. Paula. Molecular determinants of sarco/endoplasmic reticulum calcium ATPase inhibition by hydroquinone-based compounds. *Proteins: Structure, Function, and Bioinformatics*. **2008**. 70: 639-649.

DR. ISABELLE LAGADIC and her students are interested in engineering functional organic-inorganic hybrid materials with applications ranging from drug delivery to environmental remediation to polymer nanocomposites. Over the past year, first- and second-year college students have been actively involved in this research supported by CINSAM and the NKU Research Foundation and have given presentations at various scientific meetings. Dr. Lagadic was recently awarded a KY-NSF-EPSCoR Research Enhancement Grant to investigate synthetic strategies and functional uses of organo-nanoclay materials.

DR. KEITH WALTERS' research focuses on organometallic supramolecular chemistry, or the creation of "super molecules" where smaller known molecules are attached together using novel bridging structures. Of particular interest is how these molecules respond to light, with potential applications as green photocatalysts and in solar energy harvesting. Several student presentations and two peer-reviewed publications have been produced by the research, and Dr. Walters has a grant proposal currently under consideration at NSF. Keep your fingers crossed for him!

Example publication - *undergraduates

Deye*, J. R., Shiveley*, A. N., Goins*, S. M., Rizzo, L., Oehrlé, S. A., Walters, K. A. **(2008)**. Synthesis of a New Ligand for Transition-Metal Fullerene Supramolecular Systems. *Inorganic Chemistry*, 47, 23-25.

Department
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**(SAACS)
News**

Student Affiliates of the American Chemical Society (SAACS)

The NKU SAACS Chapter was awarded an "Outstanding Award" from the American Chemical Society (ACS) for its activities conducted during the 2007-08 academic year to promote professional development, student support, and chemistry awareness to the public. This is the highest award level given to SAACS chapters (less than 10% of the annual applicants receive this level). Sixteen members of SAACS attended the 237th ACS National Meeting in Salt Lake City, Utah to present their research and receive the award. The department/college/university was able to support the travel costs for 13 of these students, with three funding their own way (due to travel restrictions for funding first authors only). Outreach events over the past academic year included hands-on activities at local libraries in Northern Kentucky during National Chemistry Week; a record 36 different students participated in these events. The students also organized an Earth Day Celebration which included a human periodic table and the making of liquid nitrogen ice cream. In another outreach event, kids conducted experiments to learn the "chemistry" behind water purification. Chapter members also went on a field trip to Makers Mark this past summer, to get a "behind the scenes" look at the chemistry behind distilling bourbon. **Drs. Heather Bullen** and **Keith Walters** are the faculty sponsors.

New Hires

Dr. Lili Ma, our new organic chemistry faculty, received her B.S. and M.S. degrees from Nanjing University in China and her PhD in Organic Chemistry in 2007 from Brown University, Providence, R.I.

Dr. Kereen Monteyne, whose specialty is chemical education, received her BSc and MSc in Chemistry from McMaster University in Hamilton, Ontario in 1993 and 1995. She received her PhD in Chemistry with an emphasis in Chemical Education from The University of Montana, Missoula, Montana.

Retirements

Dr. Vinay Kumar will be retired at the end of the Spring semester 2009. Dr. Kumar joined Northern Kentucky University, then called Northern Kentucky State College, for the 1970 Fall semester after completing his PhD at the University of Cincinnati in Analytical Chemistry. Dr. Kumar was the first chemistry faculty to be hired at the new college. He was promoted through the ranks and became Professor of Chemistry in 1987. In addition to teaching Analytical Chemistry and Instrumental Analysis, he taught Electrochemistry, Analytical Chemistry for Engineers, General Chemistry, Introductory Chemistry, Chemistry and Society, Physiological Chemistry, and Discovery Chemistry. He has made 25 presentations at local, regional, and national meetings and has published 14 papers in refereed journals. Dr. Kumar, along with some of his colleagues, has been awarded over \$900,000 in grants from external sources. He has been a member of the American Chemical Society since 1969. Dr. Kumar has been married to Sunila Mehta since 1968. They have two children: his son, Roop, and daughter, Shalini, and four grandchildren. We sincerely wish Dr. and Mrs. Kumar many happy years of retirement and thank him for his many years of service to the Chemistry department and to Northern Kentucky University.

Department
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Retirements and Departures

Faculty Profile

Dr. Patrick M. Hare received his Bachelor of Arts degree from Case Western Reserve University, Cleveland, Ohio, in 2001. He received his Ph. D. in Physical Chemistry in 2007 from The Ohio State University. His thesis was entitled *Excited State Dynamics in DNA Base Monomers*. Following his degree, he spent time as a postdoctoral associate at the Department of Energy's Notre Dame Radiation Laboratory doing pulse radiolysis on supercritical fluids. Originally from Canton, Ohio, Dr. Hare and his wife, Betsy Angerman, now live in Fort Mitchell, KY. They enjoy literature and hiking, although typically not at the same time. Dr. Hare also plays bass guitar in a local choir. Dr. Hare's research focuses on using spectroscopy to learn about the properties and behavior of small molecules.

Department
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Chemistry

Profiles

Staff Profile

Jim Wilkinson is the new Freshman Laboratory Coordinator. He came to us from the College of Mount Saint Joseph where he was subject tutor for Project Excel for seven years. Following his service in the US Navy as a submarine qualified reactor operator, he received his B.S. degree in chemistry with a math minor from Bradley University in Peoria, Illinois. He received his M.S. degree in chemistry from the University of Minnesota. He lives in Westwood and has two children. Mr. Wilkinson enjoys hiking, reading and baking.

Awards and News

Freshman Chemistry Achievement Award

The 2008 Freshman Chemistry Achievement Award, sponsored by the CRC Press, Inc., was won by Wesley Baas. The Chemistry Department congratulates Wesley on being the top freshman chemistry student.

Outstanding Student Affiliate Chapter Award

The Student Affiliates of the American Chemical Society won an "Outstanding Award" for its activities during the 2007-2008 academic year. More information is provided in the Department Organizations News section.

Darwin 2009

The year 2009 marks the 200th anniversary of the birth of Charles Darwin and the 150th anniversary of the publication of "The Origin of Species". Bob Kempton organized a dinner and keynote address by Dr. Barbara Forrest at NKU on February 16th. Dr. Forrest, an expert on evolution and the creationist/intelligent design movement, gave a lecture entitled "Slam Dunk for Science and the Constitution: *Kitzmiller et al. v. Dover Area School District 2005*" to more than 130 attendees.

President Hicks

Vern Hicks was elected as president to the Kentucky Science Teachers Association. What a fitting tribute for a faculty member who has devoted a large part of his career to improving P-12 science education in our region and state.

Department
of
Chemistry

Awards and News



Aaron Swormly and Linda Schultzman at a National Chemistry Week Demo in 2008.

Recent Graduates

Ten students graduated in May 2008: **Joel Deye, Bridget Hemmerle, Matthew Martin, Lauren Miller, Joanna Minch, Celeste Morris, Rebecca Seger, Sahar Shirooni, Jami Wagner,** and **KC Wilson**. Three additional students graduated in December 2008: **Robert Anderson, MeaganLeist,** and **Areej Saqr**. Congratulations to these students for successfully completing their degree requirements and we wish them well in their careers.



Celeste Morris, Dean Kevin Corcoran, and Rebecca Seger at the Human Periodic Table event held on Earth Day.

Gamma Sigma Epsilon (GSE) Chemistry Honor Society

This spring a record 11 new members were inducted into the GSE chapter at the annual Chemistry Celebration Banquet. Since its inception in 2005, 42 members have been inducted to our chapter. In addition, chapter vice president **Whitney Schmidt** and faculty sponsor, **Dr. Keith Walters**, attended the 43rd biennial GSE conference in New York City, New York.

Advisory Board

The Advisory Board of the Department of Chemistry will meet during the fall semester 2009. The exact date has yet to be determined.

Alumni Banquet

We're just starting to make plans for our 2010 alumni banquet, so we'll be in touch once we have more definite plans. Be sure to keep your contact information up to date by signing up for the CAA as noted earlier. Stay tuned!

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