

Department of Chemistry and Physics

Newsletter

Spring 2011

Chair's Corner

Challenges come in two varieties, those that we would rather avoid and those that we can appreciate.

ISU was presented with a significant challenge this past year as it enrolled the largest freshman class in its history. Following several years of steady or declining enrollments, the extra freshmen energized the faculty and staff, who in turn committed additional effort and resources to ensure that students were well served in their academic and co-curricular activities.

Our department has always serviced a large number of freshmen, particularly in the general education chemistry (CHEM 100) and science majors' general chemistry (CHEM 105). In general, our freshman-level courses experienced enrollment increases of 10-15%.

The enrollment increase was especially significant in CHEM 105. CHEM 105 lecture sections, which have averaged about 50 students in the past, ballooned to 90 students. Most of the new students seek majors in the sciences or pre-professional preparation for careers in the health sciences. A portion of the enhanced enrollment also appears to stem from the sizeable number of students who seek to complete prerequisite science courses for admission to ISU's new physical therapy and physician assistant graduate programs. A similar enrollment increase is expected this coming fall for the general physics sequence (PHYS 105 and 106) that students typically complete during their sophomore year.

Enhanced enrollment has challenged the Department. Most of the faculty now teach one more course per semester than they did three or four years ago, and Erik Ingebrigtsen (our chemistry stockroom manager) and Michelle Baltz-Knorr (our physics laboratory coordinator) are busier than ever keeping the teaching laboratories running smoothly. We've run out of drawer space in the general chemistry teaching laboratories and are not yet certain how we will accommodate an even larger freshman class this coming fall.

It's all a good challenge for us. ISU students are good people, and we're delighted that these students have chosen to study here. If you know of any students who you believe would be well served by ISU, please send them our way. We'll be glad to work with them.

Keep in touch.

—Eric Glendening

Rare Meteorite Analyzed

During the past year Steve Wolf and two undergraduate chemistry majors, Christopher Gagnon and Joseph Compton, had the unique opportunity to analyze a rare meteorite. This meteorite, named Almahata Sitta after its impact location in Sudan, was the first meteorite ever to be observed in space, impact Earth, and be recovered. Their work was part of an international consortium to characterize what was subsequently found to be a rare type of meteorite known as a ureilite.

Undergraduate Research Laboratories To Be Renovated

The University has received a \$1.57M grant from the National Science Foundation to renovate seven undergraduate research laboratories in the Science Building. These include two laboratories in chemistry, three in geology, and two in biology. Rooms 23 and 35I-K in chemistry will be renovated to support undergraduate research activities in synthetic organic chemistry and in biochemistry. Panel reviewers for NSF were particularly impressed with the University's commitment to engage undergraduates in research through the SURE program. Demolition is expected to begin in August and should be completed by winter break. Funding for NSF's renovation program was provided by the American Recovery and Reinvestment (Stimulus) Act.

The University has also made additional monies available to renovate the Advanced Instrumentation Laboratory. The renovated facility will house most of the chemistry program's equipment, including the 400-MHz NMR, FT-IR, HPLC, and GC-MS.



The new Thermo Finnigan iTQ-1100 GC-MS, which was installed last January, is housed in the Advanced Instrumentation Lab due be renovated.

Physics Professor Joseph West Receives Tenure and Promotion

Joseph O. ("Joe") West, the newest member of the physics faculty, was awarded tenure and promotion to Associate Professor this spring. Prof. West has taught a wide variety of physics lecture and laboratory courses, including general education and introductory physics, advanced mechanics, computational physics, optics, and thermodynamics. In 2005 he received a College of Arts and Sciences Educational Excellence Award for his teaching.



Joseph West

Prof. West has involved undergraduate students in a number of different research projects. His current research interests focus on the structure of asphaltene, material left over at the end of oil processing. He is mentoring two students in the 2011 SURE Program this summer.

Prof. West's service work has included serving on the University's Faculty Affairs Committee, the College of Arts and Sciences Faculty Council, directing the pre-engineering program, and acting as interim chairperson for the Department of Physics in 2005-06.

Physical Chemistry Professor Arthur Halpern Retires in July

After 21 years as a member of the ISU faculty, Arthur M. Halpern will retire on July 1st. Opting to take advantage of the University's Phased Retirement Plan, he will continue teaching physical chemistry in the Department during the 2011-12 academic year.



Arthur Halpern

Prof. Halpern has an exceptional record of service to the University. He served as chair of the Department of Chemistry, interim chair of the Department of Physics, and interim chair of the Department of Biology, as well as serving on numerous University and College committees, including the Faculty Senate.

In 2010 Prof. Halpern was honored by the University with a Theodore Dreiser Distinguished Research and Creativity Award. During his career he has authored more than 100 academic publications, most of which have been in the area of physical chemistry, particularly the photophysics and spectroscopy of organic molecules and, more recently, computational chemistry, mainly with educational applications. He is also the author of a physical chemistry laboratory textbook.

Prof. Halpern is currently serving as associate editor for the *Journal of Chemical Education*, a monthly publication of the Division of Chemical Education of the American Chemical Society.

New Instructors Hired For 100-Level Chemistry Courses

In order to meet the demands for seats in CHEM 100 and 105 lecture and laboratory sections created by increased enrollments at ISU in the last two years, the Department has employed several instructors each semester. Beverly Pestel has been teaching CHEM 100 and 105 labs for several years. She has a special interest in chemical education and is using an innovation discovery-based approach to teaching CHEM 100 lab, the general education chemistry course.



Beverly Pestel

With the record enrollment at the University in Fall 2010, the Department hired two additional instructors, Gurvinder "Gary" Gill and Richard Gunawardane, for the 2010-11 academic year. They each taught CHEM 100, 105, and 106 labs, as well as some sections of 105 and 106 lectures. Prof. Gunawardane will continue teaching 100-level lectures and labs for the 2011-12 academic year.



Richard Gunawardane

This fall Amilla Jeewardara will join the Department on a three-year appointment as our newest instructor. Her teaching assignment will include CHEM 100 and 105 labs. The Department appreciates the recent contributions of these faculty and looks forward to working with Prof. Jeewardara!

Students Present Work at a Variety of Meetings

Regional Meetings

Chemistry and physics majors presented posters or gave oral presentations at the following meetings last year.

- 126th Meeting of the Indiana Academy of Science, Indianapolis, Mar. 5, 2011 (3 students);
- Louis Stokes Alliance for Minority Participation (LSAMP) Conference, Purdue University, West Lafayette, IN, Oct. 23, 2010 (1 student);
- Central States Universities, Inc. (CSUI) Undergraduate Symposium, Argonne National Laboratory, Oct. 15, 2010 (4 students).

National APS Meeting

Physics majors Nicole Perigo and Cameron Lancaster and Prof. Guoping Zhang presented their work at the American Physical Society March Meeting in Dallas, TX, Mar. 21-25, 2011.

National ACS Meeting

Eight chemistry majors, along with Profs. Rick Fitch and Eric Glendening, presented posters at the 241st spring National American Chemical Society meeting in Anaheim, CA, in March.



Chemistry majors at spring National ACS Meeting.

Back row, (L-R): Andy Kast, Chase Buchanan, Robert Compton, Jared Hutson. Middle: Breanna Wyman, Kaitlyn Parsons. Front: Elizabeth Neeley, Meredith Lewis.

Department Honors Outstanding Seniors in Chemistry and Physics

Elizabeth Neeley was chosen as the 2011 P.D. Wilkinson Outstanding Senior Chemistry Major. She was also one of four seniors honored by the University with a Rankin Memorial Distinguished Senior Award in recognition of her efforts to improve campus life. Beth has been very active in the Department during her 4 years at ISU, serving as a laboratory teaching assistant, stockroom assistant, president of the ACS Student Affiliate, and participating in undergraduate research with two faculty members. She will attend Indiana University Medical School in the fall.

Andrew Beaven was the 2011 Outstanding Graduating Senior in Physics. When he entered ISU in 2007, Andrew was one of 15 new freshmen chosen for a President's Scholarship, ISU's most prestigious academic scholarship. He also received a Rankin Award in 2010. Andrew has served the Department as a TA, a tutor in the Physics Help Center, has been active in the Society of Physics Students and the ACS-Student Affiliates, and has participated in the SURE program. He will enter a graduate program in physical chemistry at the University of Kansas in the fall.

Recent Grants and Publications

Members of the Department published in the following chemistry and physics journals over the past year: *Energy and Fuels* (J. West); *Europhysics Letters* (G. Zhang); *Journal of Applied Physics* (G. Zhang); *Journal of Natural Products* (R. Fitch); *Journal of Nucleic Acids* (R. Fitch); *Journal of Physics: Condensed Matter* (G. Zhang); *Meteoritics and Planetary Sciences* (S. Wolf). G. Zhang was a co-editor of the book *Computational Studies of New Materials II* (World Scientific, 2011).

Papers in the area of chemical education were published in the following journals: *International Journal of Science Education* (E. Seung); *Journal of Chemical Education* (A. Halpern; R. Kjonaas); letter to the editor in *Journal of Chemical Education* (W. Flurkey); *Journal of Science Education and Technology* (E. Seung); *The Physics Teacher* (J. West); *Research in Science Education* (E. Seung).

External grant funds were received by G. Zhang from the Department of Energy, by E. Glendening from NSF for renovations in the Science Building, and by R. Fitch from NSF (NSF-CCLI and NSF-CHE-RUI). R. Fitch received an ISU University Research Committee Grant, and E. Seung received a Charlotte Zietlow Women Faculty Grant and an Experiential Learning and Community Engagement Grant from ISU.

Chemistry Student Receives Award at Bioengineering Symposium for 2nd Time

Chemistry major Henry Owegi received the President's Award at the 48th Annual Rocky Mountain Bioengineering Symposium in Denver this April for his presentation titled "The Effect of Low Oxygen With and Without Steady-state Hydrogen Peroxide on Cytokine Gene and Protein

Expression of Monocyte-Derived Macrophages." Having received a similar award in 2010, this is Henry's second award for a research presentation at the Symposium. The study was directed by Dr. Gabi N. Waite of the IU School of Medicine-Terre Haute and is published in *Biomedical Sciences Instrumentation*, 2011, 47:58-63. Henry, a student from Kenya, has worked with Dr. Waite for several years. He graduated this spring and plans to enter an M.D.-Ph.D program in fall 2012.

Faculty Briefs...

Chemistry: **Rick Fitch** published two papers this year. One was with a collaborator at IUPUI involving some potential anticancer compounds. The second was an international PCT patent application for phantasmidine. Rick also received two grants from the NSF. The first was a grant to synthesize phantasmidine and the second grant (with Rich Kjonaas, Larry Rosenhien, and Arthur Halpern) provided the Department with a new gas chromatograph-mass spectrometer. Rick was also elected chair of the Wabash Valley Section of the ACS. **Bill Flurkey** is working with a student on the effects of macromolecular crowding on tyrosinase this summer for the SURE program. He will hit the 60-year old mark this summer, and he looks forward to playing more golf. **Eric Glendening** and his wife Sanae will be spending a month traveling in China, Mongolia, and Russia this summer. After his first year as an instructor of chemistry, **Richard Guanawardane** is spending the summer in Chicago, but will return for his second year in the Department this fall. **Arthur Halpern** will be retiring after one more year of teaching. He is still serving as an Associate Editor of the *Journal of Chemical Education*. **Jennifer Inlow** had the opportunity to teach general chemistry last spring. It was a new challenge which she enjoyed. **Rich Kjonaas** is currently serving a term as President of the Indiana Academy of Science. Now old enough to get social security, he is reluctantly planning to retire after another three years. **Beverly Pestel** is working on the development of an innovative lab program for general education chemistry courses. **Larry Rosenhein** has been keeping busy serving as one of three advisors in the chemistry program as well as teaching several classes and serving on numerous committees. **Eulsun Seung** is looking forward to having a new director of the Center for Science Education this fall. She will provide a summer science camp for elementary students in Terre

Haute with her Elementary Methods course students this summer. **Steve Wolf** continues with his research in cosmochemistry and is currently working with his students to develop improved chemical and physical methods for the analysis of trace element distributions in primitive meteorites.

Physics: **Valentina French** is serving as the physics program coordinator and academic advisor for all physics majors. This past year she was involved in developing and teaching the new Advanced Physics Lab. **Joe West** is working with two students this summer on a number of projects including: a project studying the velocity dependence of the drag coefficient of an Arrowcopter, a project on a nondestructive quality control test using video motion capture, and testing a novel method for moving large stone blocks. Joe will also be teaching PHYS 106 and 106L this summer. **Guo-ping Zhang** had five students in the SURE program last summer, working on ECG, water electricity, and plant transportation. Two of his students made presentations at the 2011 Annual American Physical Society March Meeting in Dallas. He obtained a three-year research grant from the U. S. Department of Energy.

Retired Faculty Briefs...

Myong Ahn is living in Michigan. **Marlowe Owen** enjoys living in her new condo in Terre Haute. This past February, as you might expect, she went on her annual winter cruise. **D. J. Reuland** taught in the Department one morning and one afternoon each week last spring. **Alan Siegel** is teaching organic lecture this summer. He goes to Florida and Texas often to visit his children and grandchildren. **Pat Tatum** is living in Terre Haute and is traveling as much as ever. **W. A. Trinler** is living in the Seelyville area. **Torsten Alvager** and **Adron Barbee** are both still living in Terre Haute. **Walt Carnahan** is serving as the webmaster for the Sierra Foothills Audubon Society:

(www.sierrafoothillsaudubon.com).

He contributes a monthly column to the local newspaper and spends the rest of his time photographing birds. **Phil Di Lavore** reports that he recently celebrated his 80th birthday (congratulations Phil!!). **Uwe Hansen** taught three math classes this past spring and will be teaching two math classes as well as an honors section in musical acoustics this fall. He gave presentations to the Midwest Chapter of the Audio Engineering Society in Indianapolis, the Materials Advantage Student Chapter at Rose Hulman, and the ISU College of Arts and Sciences. For the May 2011 ASA meeting in Seattle he organized a session on materials in musical instruments, chaired two sessions and gave two invited talks. He still serves as executive director of CSUI with plans for the Fall Conference in progress, and he has assumed the responsibility of editing the Proceedings of the Indiana Academy of Science. **John Swez** taught in the Department this past year. **James Westgard** is living in Wisconsin.

Staff Briefs...

Patti Archer continues to work in the Department three days a week and works at Union hospital as a nurse two days a week. **Tammy Barnes** spends half of her time in physics and half in science education. This summer she is helping plan her sister's wedding set for next spring. **Mitzi Nichols** is enjoying the fact that her son and daughter are sharing an apartment in Indianapolis this summer; son Matt is doing his residency in architecture and daughter Kristen is in her second year of pharmacy residency. In addition to teaching labs, **Michelle Baltz-Knorr** worked with John Swez this past year to convert his research lab into a teaching space for the Modern Physics and Advanced labs. **Erik Ingebrigtsen** is still keeping the chemistry stockroom under control and manages to keep up with the recent increase in the number of lab sections that are now taught.

Summer Undergraduate Research Experience (SURE) Program

Last summer marked the fifth year for the Summer Undergraduate Research Experience, or SURE Program. This ongoing program provides ISU students an opportunity to participate in an intensive research experience under the direct supervision of a faculty advisor during the summer months. Participating students received SURE Fellowships for either full- or half-time participation in the 10-week program. The students spent their time principally in the laboratory, though considerable time was also devoted to reading and searching the scientific literature, as well as discussing their progress with their peers and faculty in a series of weekly group meetings. The program concluded with the SURE 2010 Symposium.

The 2011 SURE Program commenced in May. This summer 39 students are working under the mentorship of 13 faculty mentors from ISU and the IU School of Medicine. Twenty-two of these

students will be working with six faculty members in the Department of Chemistry and Physics (listed below).

2011 SURE Fellow	Research Advisor
Jason Bonacum	GuoPing Zhang
Chase Buchanan	Rick Fitch
Robert Compton	Eric Glendening
Eboni Duff	Steve Wolf
Caityn East	Eric Glendening
George Fritch	Bill Flurkey
Christopher Gagnon	Steve Wolf
Caleb Gilman	Rick Fitch
Ben Hancock	Eric Glendening
Payton Kuhnle	GuoPing Zhang
Hunter Lavoine	Rick Fitch
Cameron Lancaster	Joe West
Chris Maurer	Joe West
Kirsten Middleton	GuoPing Zhang
Daniel Moser	GuoPing Zhang
Rebecca Norcross	Rick Fitch
Kaitlyn Parsons	Eric Glendening
Nicole Perigo	GuoPing Zhang
Jessica Stanfield	Rick Fitch
Emery Steele	Rick Fitch
Katelynn Taylor	Rick Fitch
Kevin Waters	GuoPing Zhang

Alumni Notes...

Vincent A. DiNoto (Physics BS, '77; Physics MA, '79) recently completed his 25th year as a professor of physics and astronomy at Jefferson Community and Technical College in Louisville, KY, where he has designed a modularized applied physics course. He is currently serving as co-PI of the National Geospatial Center in Corpus Christi, TX, as well as co-PI of the National Information and Communication Technology Center in Springfield, MA.

Ten Students Receive Chemistry and Physics Degrees

The eight graduating chemistry majors this academic year were Joshua Brown, Nicole Cates, Julian Chike, Elizabeth Neeley, Henry Owegi, Kendall Seward, ReVetta Smith, and Breanna Wyman. Andrew Beaven and Ryan Lidster were the two graduating physics majors. The Department extends its congratulations and best wishes to all our graduates!



Pictured at the left are student and faculty participants (from all departments) in the 2010 SURE Program. First row (L-R): Nicole Terrell, Tiffany Freeman, Courtney Owen, Breanna Wyman, Katie Gritten. Second row (L-R): Nicole Perigo, Eryn Hasenour, Meredith Lewis, Kaitlyn Parsons. Third row (L-R): Daniel Moser, Chase Buchanan, Logan Fulford, Joseph Botros, Jared Hutson. Fourth row (L-R): Cameron Lancaster, Jeff Tharp, Andy Kast. Fifth row (L-R): Christopher Gagnon, Joseph Compton, Richard Rosales, Robert Plummer. Sixth row (L-R): Jennifer Latimer, Guoping Zhang, Stephen Wolf, Gabi Waite, Rick Fitch, Bill Flurkey, Eric Glendening, Henry Owegi, Kevin Waters, Topher Maurer, Robert Compton, Doug Buren, Nicole Cates. **Not pictured:** Mark Botros, Brooke Haldeman, Allan Albig, Michael Angilletta, and Joe West.

Indiana State University
Dept. of Chemistry & Physics
Terre Haute, IN 47809



ISU Department of Chemistry and Physics Newsletter

We want to hear from you!

Please send us your updates for inclusion in the "Alumni Notes" section of the newsletter. Send an email to Jennifer Inlow (jennifer.inlow@indstate.edu) or complete the form on the insert and mail it to the Department.

Check out the alumni link on the Department of Chemistry and Physics website.

The Department of Chemistry and Physics website provides information for current and prospective students as well as a link to alumni contact information.

http://www.indstate.edu/chem_phys

Questions or comments?

Contact
Eric Glendening, chairperson, at:
eric.glendening@indstate.edu or
812-237-2239.