

Department of Chemistry and Physics Newsletter

Summer 2013

Chair's Corner

The past four years have been particularly good ones for the chemistry and physics programs at Indiana State University. Most importantly these years have witnessed strong enrollment growth in our freshman- and sophomore-level courses as larger numbers of students pursue careers in the health professions and other health-related fields. The number of pre-nursing students has dramatically increased in recent years, and many students in freshman-level chemistry and physics seek admission to the new Physical Therapy and Physician Assistant programs at ISU.

Growth presents challenges. Total enrollments in our 100-level chemistry and physics courses are about 75% larger than what they were just five years ago. Because laboratories have limited occupancy, we have had to open many additional sections of laboratory courses to meet demand, so most members of the faculty are teaching one more course per semester than they did in the past. And we suspect that there is unmet demand because nearly every seat we offer in our 100-level courses is occupied at the beginning of the semester.

Fortunately, we have been permitted to hire an additional faculty member, increasing the chemistry faculty from eleven members to twelve. John Moody will join the Department as a lecturer for the 2013-14 academic year. John just completed the requirements for a Ph.D. in chemistry at the University of Georgia. He has prior teaching experience at Valdosta State

University. This is the first time that the size of the Chemistry and Physics faculty has increased in over two decades. The enrollment trend in physics tends to follow (by one year) that of chemistry, so we hope that there will be similar support for expanding the physics faculty in the near future.

The Department also anticipates receiving additional funding to renovate more laboratory space. This work is critical for 100-level chemistry which is out of lab space. We expect having seven new chemistry and physics labs and a renovated Chemistry and Physics Help Center by the start of Fall 2014 classes.

We are preparing for another demanding year.

Keep in touch. —Eric Glendening

Physic Students and Professor Spend the Summer Trying to Solve an Ancient Mystery

During the 2012 Summer Undergraduate Research Experience (SURE) Program, Professor Joe West worked with physics students on a project testing a new method for moving large stone blocks using only rope, wood, and "people power," as might have been done to build the pyramids. The early results were promising, so this summer he and his students are hoping to scale up the tests to move blocks weighing 1000 pounds. Prof. West and his students describe the project in a brief video on ISU's website: <http://www.indstate.edu/news/video.php?videoid=747>

Hello from the faculty and staff of the Department of Chemistry and Physics!



Front row (L to R): Patti Archer, Amila Jeewandara, Valentina French, Eulsun Seung, Jennifer Inlow, Richard Gunawardane, Rich Kjonaas.

Back row (L to R): Joe West, Eric Glendening, Bill Flurkey, Larry Rosenhein, Rob Noll, Erik Ingebrigtsen, Guoping Zhang, Michelle Baltz-Knorr, Rick Fitch, Robert Compton, Steve Wolf.

Alumni Notes...

Matthew Vannette (Physics BS, '99) and his wife Jennifer live in Midland, MI, where he is an Assistant Professor of Physics at Saginaw Valley State University. They have two sons, Gabriel (8) and Malachi (4).

Timothy Templeton (Chemistry BS, '89) is currently living in Green Valley, AZ.

Mary Branham (Physics BS, '76; Physics MA, '78) is a staff physicist in aerospace research and development for Northrop Grumman in Redondo Beach, CA; she is developing the system architecture and optical designs for an integrated air and space assets system that will involve low-flying drones and aircraft and spacecraft with interactive optical payloads.

Francis Tenbarge (Chemistry BA, '71) recently retired from a senior product development chemist position at Cargill in Hammond, IN. He currently lives in Scottsdale, AZ.

Recent Publications by the Faculty

Members of the Department published in the following chemistry and physics journals over the past year: *AIP Advances* (G. Zhang); *Applied Sciences* (G. Zhang); *Journal of Applied Physics* (G. Zhang); *Journal of Computational Chemistry* (E. Glendening); *Journal of Physical Chemistry C* (G. Zhang); *Journal of Physics B: Atomic, Molecular, and Optical Physics* (G. Zhang); *Molecular Physics* (G. Zhang); *Physical Review B* (G. Zhang); *Physical Review Letters* (G. Zhang); *Plant Molecular Biology* (J. Inlow); *Talanta* (S. Wolf).

Papers in the areas of chemical and science education were published in the following journals: *International Journal of Science Education* (E. Seung); *Journal of Chemical Education* (E. Glendening; R. Kjonas); *Journal of Science Teacher Education* (E. Seung).

Chemistry Faculty Profile: Robert Noll

Robert J. ("Rob") Noll grew up in Wooster, Ohio. He earned a B.A. in chemistry, *magna cum laude*, from Carleton College in Northfield, Minnesota, in 1987 and a Ph.D. in physical chemistry from the University of Wisconsin-Madison in 1994. Rob completed post-doctoral work in environmental analytical chemistry and then taught physical chemistry laboratory for two years, both at the University of Wisconsin, before teaching analytical chemistry at Lawrence University in Appleton, Wisconsin, from 1999 to 2001. In 2001 he followed his wife to Purdue University where he worked as a research scientist in the laboratory of Prof. R. Graham Cooks, pursuing research in mass spectrometry, miniature chemical instrumentation, and gas phase ion chemistry. While at Purdue, Rob was able to work on the orbitrap—a wholly-new type of mass spectrometer—and led the successful effort of nearly a dozen individuals, including professionals and graduate students, to design and fabricate ten second-generation miniature (shoe-box sized, 7 kg) mass spectrometers.

In the fall of 2012, he started his current position as assistant professor at Indiana State. At ISU, Prof. Noll's main teaching responsibility has been CHEM 461/462, Physical Chemistry I and II, and their associated laboratory courses, CHEM 461L/462L. These courses cover thermodynamics, chemical kinetics, quantum mechanics, and spectroscopy. One topic he particularly enjoys covering in CHEM 461 is perpetual motion machines, believing that all scientists should be able to readily detect and debunk scams and pseudo-science. Rob's research and teaching interests cover the areas of physical and analytical chemistry. He is particularly interested in gas phase chemical reactions, spectroscopy, mass spectrometry, and miniature

(fieldable) instrumentation. His current research project involves designing and constructing a hand-held ion mobility spectrometer for analysis of the vapors of volatile organic compounds; he is working with four undergraduate research students this summer. The ultimate goal of his research is to produce a version of Star Trek's "tricorder" device. He is married to Elizabeth Hoffmann, a professor of sociology at Purdue University. Their daughter, Emily, has just finished kindergarten and is looking forward to first grade. His hobbies include reading, mostly history. In his junior year of high school he was an exchange student to Hannover, West Germany, through Rotary International's Youth Exchange Program.



Robert Noll

Ten Students Receive Chemistry and Physics Degrees

The nine graduating chemistry majors this academic year were Kathleen Bitzel, Robert Compton, Chelsea Elwood, David Long, Laura Major, Kaitlyn Parsons, Cody Prickett, Andrew Roman, and Jeusun Yang. Kevin Waters was the sole graduating physics major. These students and their parents were honored at a departmental reception prior to the commencement ceremony on May 4th.

Students Present Research Projects

Local & Regional Meetings

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

- 128th Meeting of the Indiana Academy of Science, Indianapolis, IN, Mar. 9, 2013 (2 students);
- Rose Hulman Interdisciplinary Research Collaborative, Rose Hulman Institute of Technology, Terre Haute, IN, Oct. 22, 2012 (4 students);
- Indiana State University Exposium (ISU's annual celebration of student research and creativity), Apr. 4, 2013 (2 students).
- Chemistry major Hallie Harbison received the best poster design award at ISU's Exposium for her work with Prof. Eric Glendening titled "Global Optimization of Carbon and Boron Nitride Clusters Using a Genetic Algorithm."

National APS Meeting

Two physics majors presented their work with Guoping Zhang at the American Physical Society Meeting in Baltimore, Mar. 18-22, 2013.

National ACS Meeting

Six chemistry students presented posters at the 245th National American Chemical Society Meeting in New Orleans, Apr. 8, 2013.

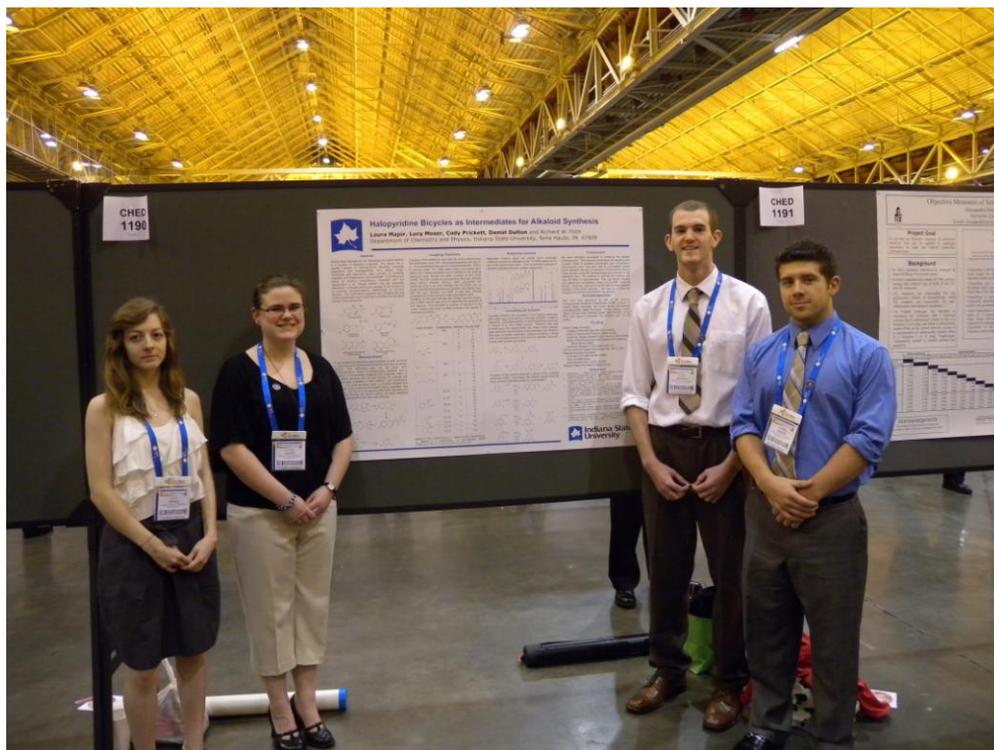
Chemistry majors presenting their posters at spring National ACS Meeting in New Orleans.

L-R: Lucy Moser, Laura Major, Cody Prickett, Daniel Dalton.

Outstanding Chemistry and Physics Graduates Recognized

Cody Prickett, from Indianapolis, Indiana, is the recipient of the 2013 P. D. Wilkinson Award recognizing outstanding student accomplishment in chemistry and contributions to the chemistry program. Cody will graduate Magna Cum Laude with a degree in Chemistry and a minor in Psychology. He has served the Department of Chemistry and Physics as a student tutor. Cody received the Donald and Mary Jo Stanley Scholarship in 2012 for demonstrating a commitment to the research programs of the Department. Last summer, Cody performed research with Prof. Rick Fitch on an organic chemistry project. He presented his research at the Rose-Hulman Institute of Technology and the National American Chemical Society meeting in New Orleans. Cody plans to work as a chemist after graduation. He is considering pursuing a medical degree or graduate degree in psychology.

Kevin Waters graduated from Vilseck American High School in Vilseck, Germany. Kevin will graduate from Indiana State University with a degree in Physics with honors and minors in Mathematics and Language Studies. Kevin has worked for the Department of Chemistry and Physics as a teaching assistant and tutor. He also performed research in the Summer Undergraduate Research Experience (SURE) program for three years, and presented his research at the 2013 American Physical Society March Meeting in Baltimore. Kevin has also worked for ISU's Residential Life as an Academic Peer Advocate. He is a member of Sigma Pi Sigma (the Physics Honors Society) and Alpha Lambda Delta, a society for academic achievement. Kevin will pursue a Ph.D. in Physics at Michigan Technological Institute in Houghton, Michigan. His area of research will be computational materials physics.



Faculty Briefs...

Chemistry:

Robert Compton, who completed his chemistry degree at ISU in December 2012, taught several general chemistry labs for the Department this past spring. **Rick Fitch** moved to a new house on the east side of Terre Haute. He began a new collaboration with David Cannatella, an ecologist and frog specialist at the University of Texas at Austin, to determine why poison frogs don't poison themselves. As expected, **Bill Flurkey** is still tinkering around with mushroom tyrosinase. He is happy to report the recent marriage of his daughter, Allison, to Will Jackson (both ISU grads) on June 15th. In January **Eric Glendening** released NBO6, version six of the natural bond orbital program that he and colleagues at the University of Wisconsin-Madison have developed over the past three decades. The program receives about 1000 citations per year from computational chemists around the world. **Richard Guanawardane** is spending the summer in his native country, Sri Lanka. **Jennifer Inlow** is gearing up to teach biochemistry lab (Chem 431L) for the first time next fall. She and Bill Flurkey are testing all of the experiments this summer. She is looking forward to visiting family in Texas and North Dakota late in the summer. **Amila Jeewandara** has been teaching 100-level lab courses but will take on the new challenge of teaching a general chemistry lecture section next fall. **Rich Kjonaas** is gearing up for the huge increase in the number of organic students this coming fall; so far over 120 have registered and this is expected to increase as the summer goes on. This summer **Rob Noll** just completed his first year in the Department, having taught Physical Chemistry I and II with labs. **Larry Rosenhein** will continue working on the metal-isocyanide project he started last summer; he is also developing a catalytic hydrogenation of limonene experiment as part of a grant to integrate laboratory work into

different courses. **Eulsun Seung** will be awarded tenure and promotion to associate professor this August. As usual, she and the students in her Elementary Methods course will conduct the Summer Science Camp for Terre Haute elementary students this summer. **Steve Wolf** continues with his research in cosmochemistry and is currently working with his students to develop methods for the analysis of halogens in primitive meteorites.

Physics:

Valentina French continued to develop the Advanced Physics Laboratory course with a new experiment. This summer during the SURE program **Joe West** will continue a project he started last summer, testing a new method to move large stone blocks using only rope, wood, and "people power" (as might have been used to build the pyramids). He hopes to scale up to blocks weighing 1000 pounds. Check out a video in which he and his students describe the project: <http://www.indstate.edu/news/video.php?videoid=747> **Guo-ping Zhang** has had a productive year, publishing nine papers and working with several research students.

Retired Faculty Briefs...

Myong Ahn is living in Michigan. **Torsten Alvager** is living in Terre Haute and is frequently on the ISU campus. **Adron Barbee** is still living in Terre Haute. **Walt Carnahan** is serving as the Program Chair and webmaster for the Sierra Foothills Audubon Society: (www.sierrafoothillsaudubon.com). He spends his free time photographing birds. **Phil Di Lavore** and his wife will be celebrating their 60th wedding anniversary this year!! Phil reports that he is spending too much time on the computer and too little time on woodworking. **Arthur Halpern** is serving as an Associate Editor of the *Journal of Chemical Education*. **Uwe Hansen** is serving as the editor of the *Proceedings of the Indiana Academy of Science*

and as executive director of Central States Universities Inc. **Marlowe Owen** is living in Terre Haute and is currently planning a trip to Glacier National Park by way of Amtrak. **D. J. Reuland** is still living in Terre Haute. **Alan Siegel** reports that he has once again become a grandfather. His daughter Elizabeth and her husband are the proud parents of a baby boy. **John Swez** has been teaching Physics 101 (Introductory Physics-- Algebra Based) at IVY TECH Terre Haute Campus this past year. John has passed his Amateur Radio Extra Class exam for the F.C.C. and now holds the call letters AC9AZ and is very active in Amateur Radio. He has just returned from an International Conference in Amateur Radio held in Dayton, OH. He currently is a Technical Specialist for the Indiana Section. **Pat Tatum** is living in Terre Haute and is traveling as much as ever, although lately some of those miles have been by air rather than by car. **W. A. Trinler** is still living in the Terre Haute area. **James Westgard** is still living in Wisconsin.

Staff Briefs...

Patti Archer enjoys traveling during her free time. Last fall she went to Cape Cod and Martha's Vineyard and travels to Columbus or Toledo for most holidays to visit with her kids and grandkids. **Mitzi Nichols** is proud to report that her son, Matthew, will start his last year of graduate school at Ball State to become a licensed architect. He was married in December to Danielle Schuster. Her daughter, Kristen, just finished her second year of teaching at Butler University as an Assistant Professor of Pharmacy Practice. **Michelle Baltz-Knorr** is working on expanding the Department's collection of physics demonstrations. If you have a favorite demonstration to suggest, please let her know! **Erik Ingebrigtsen** and his wife took a trip to Philadelphia this May. He especially enjoyed seeing the Liberty Bell and Independence Hall.

2013 Summer Undergraduate Research Experience (SURE) Program Draws Record Number of Students

2012 marked the seventh year for ISU's ongoing Summer Undergraduate Research Experience, or SURE Program. The program provides ISU students an opportunity to participate in an intensive research experience under the direct supervision of a faculty advisor for 10 weeks during the summer months. Participating students received SURE Fellowships and 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 2012 Symposium in which each student presented a poster describing his/her work.

The 2013 SURE Program commenced in May. This summer a record 40 students are working under the mentorship of 13 faculty

members from ISU (from biology, chemistry, geology, math/CS, and physics) and the IU School of Medicine. Twenty of these students are working with six faculty members in the Department of Chemistry and Physics (listed below).

2013 SURE Fellow	Research Advisor
Mopelola Akinlaja	Rick Fitch
Jason Bonacum	GuoPing Zhang
Dan Burkett	Rick Fitch
Tyler Cunningham	Steve Wolf
Kyle Drake	GuoPing Zhang
Emily Dransfield	Rick Fitch
Caitlyn East	Steve Wolf
Greg Gallagher	Joe West
Ben Hancock	Rob Noll
Hallie Harbison	Steve Wolf
Hunter Lavoine	Rick Fitch
Suji Lee	Rob Noll
Amber Lockett	Rob Noll
Seth Lutjemeyer	Rick Fitch
Katherine Milsho	Bill Flurkey
Zachery Piehl	GuoPing Zhang
Veronica Rodriguez	Rick Fitch
Kristopher Rogers	Rob Noll
Anna Walls	Rick Fitch
Hanyang Zhou	Rick Fitch

Pictured below are student and faculty participants in the 2012 SURE Program. Front row (L-R): Mariyam Houston, Courtney Morris, Lauren Rollings, Sydney Holmberg, Carly McDonald, Laura Major, Jessica Stanfield, Ellery Steele, Bethany Alkire, Amber Wilcox, Lucy Moser, Prof. Kit Murphy. Second row (L-R): Prof. Steve Templeton, Prof. Jennifer Latimer, Sarah Ford, Hannah Pond, Tyler Biggs, Daniel Dalton, Erin Wheeler, Jason Bonacum, Ian Burry, Michael Rose, Kyle Drake, Prof. Guoping Zhang. Third row (L-R): Prof. Rick Fitch, Hallie Harbison, Prof. Larry Rosenhein, Evan Rush, Seth Lutjemeyer, Sam Verga, Cody Prickett, Matt Whitaker, Keith Dietel, Greg Gallagher, Prof. Tim Mulkey, Tiago Sartor. Fourth row (L-R): Prof. Allan Albig, Kenneth Ndlife, Jonas Castro, Prof. Bill Mitchell, David Van Halen, Nathan Lee, Austin Thomas, Prof. Joe West, Prof. Jeff Kinne, Prof. Bill Flurkey. Not pictured: Daniel Burkett, Nancy DeGott, Kevin Waters, Prof. Rusty Gonser, Prof. Eric Glendening.



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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
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812-237-2239.