

Department of Chemistry and Physics Newsletter

Summer 2016

Highlights from the 2015-2016 Academic Year

- A record number of students graduated with chemistry or physics degrees this year. The graduates and their parents were honored at a departmental reception prior to the commencement ceremony on May 7th. See page 2 for a list of the graduates.
- Corridor renovations in the Science Building began this spring. Lighting and flooring will be updated or replaced, and spaces will be opened up to accommodate several small lounges where students can study and socialize. The first floor (where Physics is located) will be completed this summer, with the basement (location of Chemistry) scheduled for the summer of 2017.
- Brendon Mikula completed his first academic year in the Department as a physics instructor (see page 2 for his profile).
- Ryan Van Hoveln completed his first academic year in the Department as a tenure-track organic chemist (see page 2 for his profile).
- Kendra Dewese will join the Department this fall as a chemistry instructor; she will teach organic chemistry lectures and labs (CHEM 351, 352). Kendra will complete her Ph.D. in organic chemistry this summer from the Ohio State University, working under the mentorship of Professor T.V. RajanBabu
- In March the Department underwent an external review by the Council on Undergraduate Research (CUR). The review was conducted by a team of three CUR members, two from chemistry and one from physics. The final report praised the collegiality of members of the Department, the strong leadership of Chairperson Glendening, and the commitment of the faculty to excellence in undergraduate education in the classroom and research labs. The reviewers recommended a complete renovation of the chemistry stockroom, and plans for this are already underway.
- The Department recently launched a Facebook page in order to engage current students and connect with alumni. Please follow the ISU Department of Chemistry and Physics on Facebook!!
<https://www.facebook.com/isu/chemphys/>
- This year's Summer Undergraduate Research Experience (SURE) attracted 42 students who are currently working with faculty from Chemistry, Physics, Biology, Geoscience, Computer Science, Political Science, and Applied Medicine and Rehabilitation. The program will conclude with a research symposium at the end of July. See page 5 for details.

Robert Compton Headed Toward Graduate School at Purdue University

ISU alumnus and chemistry major Robert Compton (class of '12) taught General Chemistry labs (CHEM 105L and 106L) and Foundational Studies Chemistry labs (CHEM 100L) in the Department during the 2014-15 and 2015-16 academic years to help cover increased enrollment in our 100-level courses. We greatly appreciate Robert's rigorous and conscientious work with students in these lab courses and will miss him next year, but we are very pleased that he has been accepted to the Purdue University Chemistry Graduate Program where he will begin his studies in August. He plans to pursue a Ph.D. in inorganic chemistry. Robert's fiancée will be working on a master's degree in creative writing at Purdue; their wedding is planned for December.



Chemistry Faculty Profile: Ryan Van Hoveln

Ryan Van Hoveln grew up in Watseka, IL, which is about 100 miles north of Terre Haute and just on the other side of the border. He attended Bradley University as an undergraduate and earned a B.S. in Chemistry and Religious Studies (which he knows is an uncommon combination). He then went to the University of Wisconsin – Madison for his graduate work. While there, he worked for a relatively new professor, Jennifer Schomaker, and under her guidance studied an unusual copper-catalyzed reaction. Last summer, he defended his dissertation and received his Ph.D., and then promptly moved to Terre Haute to begin life at ISU as a tenure-track chemistry professor.

In his first year, Ryan enjoyed teaching Organic I (fall) and Organic II (spring). He especially enjoyed all of the interaction with students and getting to know them. In the last year, he has set up his research lab and has started doing research with students. This summer he is mentoring four students in the Summer Undergraduate Research Experience program (SURE). His research interest is organometallic chemistry with a focus on first row transition metal catalysis and will continue to develop new copper-catalyzed reactions. After a few reactions are developed, he hopes to study them both experimentally and computationally.



Ryan Van Hoveln

Physics Faculty Profile: Brendon Mikula

Brendon Mikula joined the Department in the fall of 2015 as a physics instructor. He grew up in Holland, MI, and received a degree in physics from Lyman Briggs College at Michigan State University. Brendon completed his doctorate in Physics Education Research at The Ohio State University in 2015, specializing in building student fluency with procedural mathematical skills essential for success in introductory physics courses. He served as a TA for physics laboratories and recitations at MSU and OSU and received an “Outstanding Learning Assistant” award from Lyman Briggs.

During his first year at ISU, Brendon taught foundational studies physics lecture and laboratory (PHYS 105/105L and PHYS 106) as well as the upper-division elective astronomy course (PHYS/ENVI 360). In Spring 2016, he began pilot testing workshop/recitation sections in PHYS 105, with the goal of giving students more time and practice with problem-solving.

Since joining the faculty at ISU, Brendon has served as advisor for the Society of Physics Students chapter on campus, helping to direct and organize various public outreach opportunities. Brendon also volunteers with the Science Olympiad team at Terre Haute North Vigo High School.



Brendon Mikula

Recent Grants and Publications by the Faculty

R. Fitch (PI) received a grant for a new orbitrap mass spectrometer (NSF Major Research Instrumentation program) along with **R. Noll**, **S. Wolf**, **W. Flurkey** and **D. Hews** (Biology Dept.). The instrument is a high resolution mass spectrometer that can do tandem mass spectrometry and can be used for structure determination of small molecules and sequencing of peptides/proteins. It was installed in December.

R. Fitch also received an NSF grant for a collaborative project with David Cannatella of the University of Texas at Austin. The funds will be used to examine autoresistance in poisonous frogs.

Members of the Department published in the following journals over the past year:

G. Zhang: *EPL*; *SPIN*; *Journal of Physics: Condensed Matter*.

E. Seung: *Eurasia Journal of Mathematics, Science, and Technology Education*; Chapter in *Elicited Metaphor Analysis in Educational Discourse*.

Twenty Seven Students Receive Chemistry and Physics Degrees

Twenty students graduated with chemistry majors in August, December, or May of the past academic year: Mopelola Akinlaja, Daniel Dalton, Lindsie Downing, Patrick Ellis, Kadijah Evans, Justin Forkert, Megan Holton, Kassandra Kersey, Connor Kirtley, Ioanna Koltsidou, Kelsey Krebs, Gregory Kuhlman, CaSondra Linne, Carly Nash, Erika Nord, Travis Norman, Bryn Schwartz, Austin Skaggs, Samantha Smith, and Jerry Strahle. The seven graduating physics majors this year were Justin Coffelt, Kyle Drake, Gregory Gallagher, Phillip Ingalls, Tanner Latta, Cody McGuire, and Christopher Rodgers.

Senior Chemistry Major Receives Hines Medal

Connor Kirtley was one of six graduating seniors recognized during spring commencement as a recipient of the Hines Memorial Medal. The medal is awarded to students with the highest cumulative grade-point average during the pursuit of a bachelor's degree at ISU. Connor, the son of William and Laura Kirtley, graduated from Seymour High School in 2012. In the fall of that year he came to ISU as a member of the Rural Health Program. In addition to the Hines Medal, Connor has received several other awards recognizing his academic achievements at Indiana State. These have included the Freshman General Chemistry Achievement Award, the Outstanding Achievement in Organic Chemistry Award, the Stanley Scholarship, and the P.D. Wilkinson Award given to the outstanding senior chemistry major. Connor has been active in the Lambda Chi Alpha fraternity and Student Government Senate. Within the chemistry program, he served as a laboratory assistant for both organic and physical chemistry. He graduated with honors with a chemistry major and will be attending the Indiana University School of Dentistry beginning in July 2016. He intends to pursue his interest in owning a dental practice in a rural area.

Outstanding Graduating Senior Physics Major

Christopher Rodgers is the son of Pamela Rodgers. He graduated from Northview High school in 2005. Chris originally came to ISU in the fall of 2005 as a mathematics major. In 2006 he joined the Air Force where he specialized in Satellite Wideband and Telemetry Systems. After completing his term of service in 2012, he returned to ISU as a physics major in the spring of 2013. During his time at ISU Chris has earned numerous awards. These include: The Physics Foundation Scholarship (2015, 2014, 2013), John McCarthy Outstanding Junior Award (2015), and Best Student in Modern Physics Award (2014). He is also a member of Sigma Pi Sigma (National Physics Honors Society). Chris performed research for the past two summers in the Summer Undergraduate Research Experience program (SURE) and presented the results of his research at the American Physical Society March Meeting in 2015. He is graduating with a major in physics and plans to work in a field specializing in computational finance or computational engineering. More information about Chris's SURE research project under the mentorship of Prof. Guoping Zhang is available on the ISU website: <https://www2.indstate.edu/news/news.php?newsid=4304>

Faculty Participate in Semester-Long Growth Mindset Workshop

In 2014 ISU was one of 24 institutions that received grants from the U.S. Department of Education to fund projects to develop innovative methods to improve student success, make college more affordable, and identify effective practices. The four-year, \$1.6 million grant is for a project called "Accelerating College Completion through Academic Mindset." The project builds on recent research which has shown that students are ultimately successful when they believe they can be successful. Part of the project involves investigating the potential boosting effect of teaching faculty how to integrate "growth mindset" elements into their instruction. Bill Flurkey, Adrienne Gilbert, Eric Glendening, Amila Jeewandara, Brendon Mikula, John Moody, and Ryan Van Hoveln participated in the pilot of this part of the project over the course of the spring semester. They met weekly with the principle investigators of the grant for round-table discussions and brainstorming sessions. Next fall they will implement some of the growth mindset strategies in their chemistry courses and document the results. More information about the grant is available on ISU's website: <https://www2.indstate.edu/news/news.php?newsid=4097>

Erik Ingebrigtsen Adopts Unique Mode of Transportation

Erik Ingebrigtsen and his wife, Janice, bought a Rhoades Car (www.rhoadescar.com) a few years ago, and this semester they began using it to commute to work and back when weather permits. Erik reports that they get smiles and waves from most people they see on their commute to campus. The car has pedals for both the driver and the passenger, but it has as an electric-assist motor to help out when going uphill or when the

riders get tired. The two marine batteries for the motor are located in one of the boxes at the back and are charged via a solar panel on the roof. A second box on the back serves as a multi-purpose storage compartment. After arriving on campus, Erik parks the car in the bulk storage room in the Department. It fits on the service elevator, so bringing it down to the basement of the building isn't a problem. Erik also has been known to provide free shuttle service from the campus parking lot to the Science Building for members of the Department. Patti Archer has

been a satisfied "customer" and can confirm that Erik does sometimes yell "YABBA DABBA DOOOO!" at passersby.



Faculty Briefs...

Chemistry:

Robert Compton completed his sixth semester of teaching 100-level labs in the Department and will begin graduate studies in chemistry at Purdue University in the fall (see page 1). **Rick Fitch** has been preparing to go on sabbatical during the 2016-17 academic year. He will be working on frog alkaloid projects and using the new mass spectrometer and developing some LC-NMR methods. Provided that funding permits, he will make a trip to South America to collect frogs. **Bill Flurkey** is now a grandfather! He enjoys getting photos and videos of his first granddaughter, Eva, who was born last September. **Adrienne Gilbert** participated in the growth mindset workshop this year (see page 3 for details on the workshop) and hopes to implement some of the strategies in her classroom next fall. She is teaching CHEM 100 this summer. **Eric Glendening** traveled with nine ISU students on a medical service trip to Quito, Ecuador, last winter. **Jennifer Inlow** is working with a SURE student this summer, continuing the kombucha project she began during her sabbatical in 2015. She has been working on some knitting projects during her free time. **Amila Jeewandara** completed her MBA and participated in the spring commencement ceremony. **John Moody** completed his third year at ISU as a chemistry instructor. He continues to teach CHEM 100, 105, and 106 during the fall and spring semesters and is teaching CHEM 106 this summer. **Rob Noll** is conducting research this summer with a SURE student on thermoelectric modules. Thermoelectrics are very interesting solid-state electronic devices which develop a voltage when one side is heated and the other cooled. Run in reverse (a voltage is supplied), they will create a hot side and cool side. They form the basis for Peltier cooling devices but also represent a solid-state electronic version of a classical heat engine.

Larry Rosenhein is working this summer with a SURE student on metal complexes of inoffensive isocyanide ligands and on metal-thiolate compounds. **Eulsun Seung** visited Vinh University in Vietnam in early May to learn about the science education systems in Vietnam. She and her collaborators will use the information to prepare a grant proposal aiming to build a Science Education Center at Vinh University. **Ryan Van Hoveln** completed his first year in the Department as a new tenure-track organic chemist, having taught Organic I and II; he is working with students in the SURE program this summer (see his profile on page 2).

Physics:

Valentina French had a busy spring semester, teaching her usual courses while also acting as chairperson of a search committee to hire a new physics instructor. **Brendon Mikula** completed his first year in the Department as a physics instructor; he tested the addition of workshop/recitation sessions to PHYS 105, in order to provide students more practice with problem solving (see his profile on page 2). **Joe West** is working with two SURE students this summer. One student is investigating rotating reference frames in Special Relativity; the other student is working with the new 3D printers purchased by the Department of Earth and Environmental Systems. He is also developing an online version of PHYS 105. **Guo-ping Zhang** continues working on laser-induced ultrafast demagnetization, supported by a grant from the U. S. Department of Energy. He is also working on the superatomic molecular orbitals in fullerenes. He will be on sabbatical during the 2016017 academic year.

Staff Briefs...

Patti Archer took an extended vacation with her sister this summer. They traveled to Yellowstone and Grand Teton National Parks and Mount Rushmore. **Mitzi Nichols** became a grandma last February when her son and daughter-in-law had a baby boy, Benjamin Eli. Her daughter is on the pharmacy faculty at Butler University in Indianapolis, and Mitzi is proud to announce that she will be awarded tenure this year. This spring **Michelle Baltz-Knorr** spent time cleaning out rooms that will be affected by the hallway renovations, including lab spaces and the Physics Machine Shop. (See page 1 for more information about the corridor renovations that have begun in the Science Building.) **Erik Ingebrigtsen** enjoys riding his environmentally friendly Rhoades Car to work when the weather permits (see picture and story on page 3).

Alumni Notes...

Lauren (Dixon) Walkup (Chemistry BS, '04) is an ASQ-Certified Quality Manager for PPG Aerospace in Indianapolis. She is also Six Sigma Black Belt certified. She says that her fifth-grade son loves science and math.

Lauren Kuckewich (Chemistry BS, '06) is the Pharmacy Operations Manager at Saint Louis University Hospital in Missouri. After finishing her BS at ISU, Lauren worked for Roche Diagnostics for 2 years. She then attended Purdue University College of Pharmacy, followed by 2 years of Health System Pharmacy Administration Residency at the Medical University of South Carolina.

Heather Stout (Physics BS, '10) completed her MS in Physics at Purdue University in 2012. She is currently a fourth-year graduate student in chemistry at Carnegie Mellon University.

Summer Undergraduate Research Experience Program Continues for 11th Year

The 2016 Summer Undergraduate Research Experience, or SURE Program, began in mid-May. The ongoing program, which is now in its 11th year, 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. Participating SURE students receive SURE fellowships and spend their time principally in the laboratory, though considerable time is also devoted to reading the scientific literature, as well as discussing their progress with their peers and faculty in a series of weekly group meetings. This summer 42 students are working under the mentorship of 16 faculty advisors from Chemistry, Physics, Biology, Computer Science, Geoscience, Political Science, and Applied Medicine & Rehabilitation. Seventeen of these students (listed in the table) are working with eight

faculty members in the Department of Chemistry and Physics. Congratulations to all of these students for being selected to participate in the program!

2016 SURE Fellows in Chemistry and Physics	Research Advisor
Star Leonard	Rick Fitch
Derick Minick	Rick Fitch
Bansari Modhera	Eric Glendening
Juan Nysschen	Eric Glendening
Rebecca Rudisell	Eric Glendening
Patrick Cheek	Jennifer Inlow
Joseph Frey	Rob Noll
Joshua Coovert	Larry Rosenhein
Wendell Kirkman	Ryan Van Hovel
Bethany McCarty	Ryan Van Hovel
Brandon Mikesell	Ryan Van Hovel
Brogan Thomas	Ryan Van Hovel
Nathaniel Shanklin	Joe West
Amy Watts	Joe West
Arick Gardner	Guoping Zhang
Michael Giocolo	Guoping Zhang
Tyler Jenkins	Guoping Zhang

Students Present their Research Projects

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

NCUR Meeting

Three chemistry students—**Patrick Cheek, Allyson Morris,** and **Rebecca Rudisell**—presented posters at the National Council on Undergraduate Research Conference in Asheville, NC, April 7-9, 2016.

Local & Regional Meetings

ISU Exposium, ISU's celebration of outstanding academic work put on by the Center for Student Research and Creativity (**Allyson Morris, Zachary Parksey, Richard Wyatt,** with Prof. Fitch).

Indiana Section ACS Poster Session at IUPUI in Indianapolis, Feb. 25, 2016 (**Allyson Morris**—with Prof. Fitch). Allyson received an "honorable mention" for her poster on solid phase extraction of amines for GCMS analysis.

Butler University Undergraduate Research Conference in Indianapolis, Apr. 8, 2016 (**Phillip Ingalls**—with Prof. West).

Undergraduate Research in Chemistry Regional Poster Competition at the University of Kentucky, Apr. 22, 2016 (**Allyson Morris**—with Prof. Fitch). Allyson won 2nd place for her poster on solid phase extraction of amines for GCMS analysis.

Thanks to the ISU Center for Student Research and Creativity, the ISU College of Arts and Sciences, and the Wabash Valley Section of the ACS for funding the students' travel to these meetings.

National ACS Meeting

Patrick Cheek, Kadajah Evans, Destiney Hughes, Allyson Morris, Zach Parksey, Rebecca Rudisell, and **Richard Wyatt** presented posters at the 251st National American Chemical Society Meeting in San Diego, CA, March 13-17, 2016. The students' research mentors were Profs. Fitch, Glendening, and Noll.

National APS Meeting

Two physics majors, **Tanner Latta** and **Shan Antony**, presented oral presentations of their work done with Prof. Zhang at the American Physical Society meeting March 14-18, 2016, in Baltimore, MD.



Students at the National ACS Meeting in San Diego last March.

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All our newsletters are available *electronically* at the alumni link on the Department of Chemistry and Physics website:

http://www.indstate.edu/cas/chem_phys/

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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.

Questions or comments?

Contact

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