

**School of Science Highlights Report**  
**July 1, 2011-June 30, 2012**  
<http://science.iupui.edu>

**Introduction:** The School of Science provides outstanding science education for all IUPUI students, education in depth for Science students, and engages in research in the physical, biological, mathematical, and psychological sciences in order to increase scientific knowledge and advance the development of the life sciences at IUPUI and in Indiana. The School has an operating income of over \$50M in AY 2011–12, exclusive of external research grants. Within the seven academic departments (Biology, Chemistry & Chemical Biology, Computer & Information Science, Earth Sciences, Mathematical Sciences, Physics, and Psychology) and the Forensic and Investigative Sciences Program, there are over 160 full-time faculty members. The School is the academic home of ~2,000 undergraduate and ~450 graduate students.

### Teaching and Learning

- [Lilly Endowment Provides Nearly \\$5 Million to Continue Woodrow Wilson Indiana Teaching Fellowships](#) (December 2011) UCASE (The Urban Center for the Advancement of STEM Education), a partnership of the Schools of Science, Education, and Engineering & Technology, will be able to offer 40 additional fellowships to prepare STEM teachers for high-need urban schools. Sixteen new fellows joined the program in May 2012.
- [IUPUI Math and Science Prodigy Jake Barnett, age 13, featured on '60 Minutes.'](#) (January 2012) The CBS show featured the IUPUI Honors College and School of Science student who has been taking college math and science courses since he was eight years old. Jake is currently a sophomore taking honors classes in math and physics, while also doing scientific research with Dr. Yogesh Joglekar.
- [Software Developed by IUPUI Students Closes Gap for Physicians Seeking Radiologists](#) (April 2012) Emergency room physicians in Indianapolis hospitals now can consult quickly with radiology experts using a software and mobile phone app developed by computer science students as a semester project. The Con-Rad app has been integrated into the online systems at all five downtown IU Health hospitals. One of the students, Evelyn Hovee, returned to studies at IUPUI to earn a new [Certificate in Applied Computer Science](#).
- [Courtroom Experience Puts Forensics Students to the Test](#) (May 2012) A courtroom trial exercise is now a part of coursework to provide forensic and investigative science (FIS) students experience in being challenged as expert witnesses in court by a prosecuting attorney. Developed by FIS faculty member Scott Newman, a former Marion County Prosecutor, this mock trial targets student learning outcomes for the FIS program needed to develop highly trained and capable forensic scientists.
- [Dr. Martin O'Donnell awarded NSF-TUES Grant for Undergraduate Chemistry and Biology Labs Research](#) (April 2012) With faculty from Biology and Chemistry, the new NSF Transforming Undergraduate Education in Science (NSF-TUES) grant will unite undergraduate computational chemistry labs and microbiology labs, with a focus on authentic drug discovery research. Co-PI Ryan Denton was also awarded a [Multidisciplinary Undergraduate Research Institute \(MURI\) Award](#) to provide funding for 4 undergraduate research students.
- [Outstanding Student Research leads to Future Careers](#) (May 2012): Among the many outstanding 2012 graduates, a number of science students developed a passion for undergraduate research while at IUPUI. Two featured here are heading to prestigious graduate programs. Biology major [Jacob Layer](#) will enter Harvard University's top-ranked Biological and Biomedical Science PhD Program, and Chemistry & Chemical Biology major [Josh Horton](#) will be entering the MD/PhD program at NYU, funded by the National Institutes of Health. Horton was also selected as the [2012 Chancellor's Scholar for School of Science](#).
- [IUPUI Senior Morgan Rhodes Awarded First Sukhatme RISE Scholarship](#) (May 2012) Established by Executive Vice Chancellor and Dean of the Faculties Uday Sukhatme, the inaugural RISE Scholarships emphasize the growing importance of a curriculum that involved Research, International, Service learning and Experiential learning (RISE) experiences for IUPUI students. Ms. Rhodes, a pre-med psychology major, participated in the Health Studies Summer Program in Santiago, Chile.

## Research, Scholarship, and Creative Activity

- [School of Science Awards Exceed \\$10 million in 2011-2012](#): Collectively, faculty in the School of Science have active research and education awards totaling over \$2.7 million from the National Science Foundation (NSF), \$2 million from the National Institutes of Health (NIH), \$1.8 million from other federal agencies like the USDA and the Department of Defense, \$1.2 million in funding from Eli Lilly, Amgen, other industrial partners, non-profits, and private foundations, and \$1.4 million with state and local agencies and other universities. An additional \$1.1 million in funding is from internal awards such as CTSI, RSFG, and the prestigious [IU Collaborative Research Grants \(IUCRG\)](#) to faculty in Biology, Chemistry and Chemical Biology, Mathematics, Psychology and Physics. Two young investigators, [Mohammad Al Hasan](#) in Computer and Information Sciences, and [Yogesh Joglekar](#) in Physics, received prestigious NSF CAREER Awards for faculty members early in their careers who exemplify outstanding integration of education and research.
- [Soil Samples Reveal Urban Mercury Footprints](#) (July 2011) A new study by Earth Science professor Dr. Gabe Filippelli in the July 2011 issue of the journal *Water, Air & Soil Pollution* is among the first to investigate mercury deposits from coal fired power plants in industrialized city soil such as in Indianapolis, St. Louis, and Detroit. This study finds mercury emitted by coal-fired power plants enters local soil and regional watersheds, contaminating fish and making them unsafe for human consumption.
- [School of Science Welcomes 13 New Faculty](#) (August 2011) New faculty included Denise Slayback-Barry and Britt Reese (Biology), Christine Picard, (Biology and Forensic and Investigative Sciences), Greg Druschel, William Gilhooly, and Pamela Martin (Earth Science), Julia Arciero, Yaroslav Molkov, Mamunur Rashid, Wei Zheng and Jian “Frank” Zou, (Mathematics), Le Luo and Fangqiang Zhu (Physics). These new faculty further enhance interdisciplinary research and science education in Indiana.
- [Carbon Nanoparticles \(CNPs\) Break Barriers in the Renal Nephron](#) (September 2011) Research by Biology Professor Bonnie Blazer-Yost and others in the journal *Nanotoxicology* provides some of the first evidence that CNPs, increasingly common in our environment, damage these key cells inside the kidney.
- [New Modeling of Brain’s Circuitry Brings Better Understanding of Parkinson’s Disease](#) (September 2011) Several research papers published in 2011 and 2012 by Dr. Leonid L. Rubchinsky provide a mathematical and computational neuroscience model of the neural circuitry in patients with Parkinson’s disease, providing an approach that may eventually help scientists and clinicians correct these misfires.
- [New Strain of Lab Mice Mimic Human Alcohol Consumption Patterns](#) (December 2011) Dr. Nicholas Grahame in the Department of Psychology and colleagues developed a line of mice selectively bred over 40 generations for high alcohol preference to mimic a pattern similar to humans with alcoholism. Results published in the journal *Addiction Biology* show that mice strains engage in binge drinking, and other behaviors that will help researchers explore new genetic and behavioral determinants of alcoholism.
- [School of Science at IUPUI Launches Interdisciplinary Problem Solving Institute](#) (January 2012) The Institute for Mathematical Modeling and Computational Science (iM2CS) is dedicated to solving problems and training a new generation of students using mathematical and computational approaches. Led by Dr. Giovanna Guidoboni, mathematical sciences, and Dr. Snehasis Mukhopadhyay, computer and information science, the new institute has an initial faculty of 19 investigators in numerous disciplines.
- [New Lab Facility Addresses Critical Need for Research Space at IUPUI](#) (March 2012) IU President Michael A. McRobbie presided over groundbreaking ceremonies for a new \$25 million Science and Engineering Laboratory Building (SELB) that will provide critically needed space for faculty to engage in the education and research that contribute extensively to the economic vitality of Indiana and IUPUI. The facility will provide research and teaching labs in biology, chemistry and forensics. Construction will be completed 18 months, with the first phase to provide 81,500 gross square feet of space.
- [Computer Science Imaging Helps Researcher Build Virtual Brain](#) (April 2012) Gavriil Tsechpenakis, an assistant professor of computer science, specializes in computer vision and biomedical imaging: the use of

computational processes to help a computer to be able to “see” and analyze images. Tsechpenakis published a number of studies in 2011 and 2012 that use image modeling to essentially ‘build’ a model brain. This research has multiple applications in health and life sciences related to cell development and communication.

- [Computer technology and environmental science improve National Weather Service \(NWS\) forecasting](#) (May 2012) Dr. Yao Liang is the lead researcher collaborating with NWS, the University of Pittsburgh, and NASA’s Data Center, to rebuild the NWS’ computerized River Forecasting System to seamlessly integrate and organize data sets, offering significant potential for improving the forecast of natural disasters.
- [Antarctic Researchers Meet at IUPUI to Determine Next Base Location](#) (June 2012) The National Science Foundation (NSF) Office of Polar Programs funded a workshop, organized by Dr. Kathy Licht in the Department of Earth Sciences, to bring sixty American and New Zealand scientists to IUPUI to select a new U.S. Antarctic Program Transantarctic Mountains field camp as a new site for research on ice movement, climate change, dinosaur and other fossils, and microbes under the ice and snow.

## Civic Engagement

*Introduction:* Along with long-standing civic engagement and outreach programs, including the annual High School Genetics Conference, Project SEED, the Summer Scientist Apprentice Camp, and Project Lead the Way (PLTW) Core Teacher Institute, the School of Science had several other highlights in 2011-2012:

- [High School Teachers Discover New Ways to Engage Students at Nanotech Academy](#) (July 2011) The IUPUI Nanotechnology Discovery Academy, led by Dr. Rajesh Sardar in Chemistry as well as faculty at the Integrated Nanotechnology Development Institute (INDI), in partnership with the Center for Research and Learning (CRL), provided a unique opportunity for 13 local teachers to incorporate nanotechnology into their teaching.
- [Indiana Students Advance in Prestigious Siemens Competition](#) (November 2011) Three high school students competed in regional finals of the Siemens Competition in Math, Science & Technology, presenting the results of the research they conducted over the summer with Dr. Yogesh Joglekar in the Department of Physics. In addition to their oral and poster presentations for the Siemens Competition, the students published a manuscript in the prestigious journal *Physical Review A*.
- [Third Annual Brain Bee At IUPUI](#) (January 2012) The Department of Psychology and the School of Science hosted the third annual Indiana Brain Bee for high school students in grades 9-12. Contestants answer questions about the brain and nervous system. In addition to a \$2000 scholarship to IUPUI, the first place winner receives an expense-paid trip to compete in the National Brain Bee competition.
- [Science@IUPUI Computer Science Day](#) (March 2012) The Department of Computer and Information Science and the School of Science hosted the sixth annual Computer Science Day for high schools on March 16, 2012. Students competed in teams programming and problem solving, web development, and game programming while solving real-world challenges under a deadline. Local teachers could earn up to three certification renewal credits for participating in the challenges with their students.
- [Earth Sciences Professor Gabe Filippelli Making Soil Safe for Residents](#) (March 2012) Funded by the Indianapolis Foundation and the Central Indiana Community Fund, Filippelli and members of his lab are preparing local residents with the knowledge they need to grow safe gardens. The project involves gardening workshops, lab tests prior to gardening to test for lead that in the urban soil deposited from factory emissions, lead paint and leaded gas, and promoting garden awareness for Indiana residents.
- [Research Day Helps High School Students Understand the Potential of Science](#) (April 2012) Crispus Attucks and Ben Davis High School students, as well as students from other local high schools, heard a presentation from NSF Assistant Director Dr. Joan Ferrini-Mundy, and had the opportunity to attend poster sessions, participate in lab experiments, and visit School of Science research labs.

- [Science Students Honored With Plater Medallion](#) (April 2012) Six students in the School of Science at IUPUI have been named recipients of the 2012 William M. Plater Civic Engagement Medallion. Biology majors Kathryn Delacruz, Jessica Jackson, Daniel Popoola, Pich Seekaew and Ashley Winfield were recognized, along with Colleen Games, a student in Forensics and Investigative Sciences. All six students have had a major impact both on the IUPUI campus and within the Indianapolis community.
- [Park Tudor Senior Takes First-Place/Scholarship at IUPUI High School Math Competition](#) (May 2012) The senior earned a four-year scholarship to the School of Science with a first-place finish in this year's annual competition. Each student had six weeks to work through a series of math problems to study patterns, analyze relationships, and draft and refine their solutions before submitting their work.
- [Doctor Camp and Camp Medical Detectives Get Kids Excited About Careers in Medicine](#) (June 2012) Undergraduate students and faculty from the Schools of Medicine and the School of Science, including Dr. Corinne Ulbright in Biology, were the instructors and camp counselors Doctor Camp and at Camp Medical Detectives for local student in grades 5 through high school.
- [STEM Fellows: Science Grad Students Promote Science to Local Students](#) (June 2012) IUPUI Science graduate student Lindsay Hammack and Luis Palacio are featured in a front page Indianapolis Star article about the IUPUI GK-12 Urban Educators program. GK-12 fellows work for a year local schools as a Scientist in the Classroom and bring authentic research into high school or middle school classrooms.

## Diversity

- [Undergraduate Chemistry Major Cornelius Audu Selected to Participate in 12th Annual Berkeley Edge Conference](#) (March 2012) The conference is a highly competitive program designed to increase the number of doctorates awarded to underrepresented minorities and to diversify the nation's faculty in STEM disciplines. Cornelius is a McNair Scholar sponsored by the IUPUI Center for Research and Learning.
- [IUPUI Honors Leslie Ashburn-Nardo with 2012 Chancellor's Diversity Scholar Award](#) (March 2012) Issued by the Office of Diversity, Equity and Inclusion, this award recognizes an outstanding faculty member who exemplifies the value of diversity in scholarship and service and maintains a record of high accomplishment and leadership. Within the School, Dr. Ashburn-Nardo is a leader in the Science Diversity Council.
- [Biology Senior Daniel Popoola Presents Research Before Congress](#) (April 2012) Daniel presented his research on alcohol dependence at the National Conference for Undergraduate Research (NCUR) in March 2012 and at IUPUI Research Day in April 2012, and was selected as one of only 74 students nationally to present at the highly competitive *Posters on the Hill* event in Washington DC in April 2012.
- [Three Science Students Honored as Outstanding Women Student Leaders](#) (April 2012) Science majors Jessica Jackson, a senior in biology; Ashley Winfield, a senior in biology; and Fatoumata Bah, a junior in chemistry were among five students named as Outstanding Woman Student Leaders by the IUPUI Office of Student Involvement as part of the Women's History Month celebration.
- [Undergraduate Tomas Meijome Recognized For His Extensive Research](#) (April 2012) Tomas earned the Bowling-Jones Russo Memorial Undergraduate Research Award for his research in regenerative medicine. Meijome has been part of several IUPUI research programs, including the Diversity Research Scholars Program, the Louis Stokes Alliances for Minority Participation (LSAMP) Program and the IU School of Medicine Prospective Physician-Scientist Summer Research Program.
- [Women in Science House Fosters Success & Impact](#) (May 2012) Five seniors women who graduated among the top 100 students on campus are all residents of the Women in Science House (WISH): Kylie Bontrager, Jessica Hashu, Jessica Jackson, Jessica Rodenbeck and Ashley Winfield. These women are among the 30 who live in the WISH environment that fosters academic development through the study of science.

## Best Practices

- [School of Science Class of 2015 Science! Welcome Picnic](#) (September 2011) Over 300 IUPUI science students, professors and staff gathered on the north lawn of the library to welcome the class of 2015 at the third annual Science!Welcome Picnic. Free food, games and fun and student club opportunities for freshmen and other science majors kicked off the start of the new academic year.
- [School of Science Announces New Student Ambassador Scholarships](#) (September 2011) Through this unique scholarship program, the Science Ambassador Leadership Team will offer student perspectives to recruitment events and communications, and provide support for contacting prospective students.
- [Science Open Houses Give High School Students Scoop on Launching Science Careers](#) (October 2011) High school students explored academic opportunities and careers in Life and Health Sciences, and 21st Century Careers in the School of Science. Prospective students learned about undergraduate research opportunities, internship programs, engagement opportunities and peer mentorship at IUPUI.
- [School of Science Scholars Event Celebrates Student Success](#) (April 2012) Several hundred students who earned a spot on the Dean's or Scholar's List were recognized at this evening event that also included parents as well as high school students recently admitted to the School of Science. All the students honored at the event had achieved at least a 3.5 GPA (Dean's List) or 3.75 GPA (Scholar's List).
- [School of Science Honors Convocation Recognizes Students and Faculty](#) (April 2012) Dozens of School of Science students and faculty were recognized at the annual Honors Convocation, honoring scholarship winners, outstanding students, and departmental and school awards for faculty across all departments.

### **External Awards and Appointments**

- [School of Science Appoints John V. Goodpaster Director of Forensic and Investigative Science Program](#) (August 2011) Goodpaster formerly served as a forensic chemist with the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) and specializes in the analysis of intact explosives, their postblast residues, and [preserving soil samples from suspected arson sites](#). Goodpaster succeeds founding director Jay A. Siegel to direct the first and only nationally accredited forensic science program in Indiana.
- [IUPUI Prestigious Awards for School of Science Faculty](#) (March 2012) Andrew Barth, a professor of earth sciences, earned the 2012 Chancellor's Professor Award, the campus' most distinguished faculty appointment. Two faculty members earned the Prestigious External Award Recognition (PEAR) award for national or internationally accomplishment: Stephen Boehm, psychology, and Yogesh Joglekar, physics.
- [Nine Science Students Among Top 20 Students at IUPUI](#) (April 2012) The IUPUI Alumni Council and the Student Organization for Alumni Relations (SOAR) recognized 34 School of Science students selected as members of the Top 100 students at IUPUI. Nine of the 20 students named among the Top 10 male and Top 10 female students across the entire campus were Science majors.
- [Biology Professor Anna Malkova Named 2012 Research Frontier Trailblazer](#) (May 2012) The Award recognizes outstanding IUPUI researchers who are nationally and internationally known for their accomplishments in advancing the frontiers of knowledge. Malkova's research focuses on fundamental mechanisms of DNA repair and their role in the development of cancer and other genetic diseases.
- [Biology Professor Steve Randall Honored With the CRL Director's Award](#) (May 2012) Dr. Randall was recognized for his outstanding leadership and mentoring of 49 undergraduate research students, 40 of whom have published abstracts, delivered talks, or published manuscripts. Randall currently directs an NSF-Undergraduate Research Mentoring program (NSF-URM) grant for interdisciplinary undergraduate research.
- [Earth Sciences Professor Gary Rosenberg Honored by the Geological Society of America](#) (June 2012) The Mary C. Rabbitt History of Geology Award is the highest award of its kind and recognizes outstanding contributions to

the understanding of the history of the geological sciences in the US and abroad. Rosenberg's research specializations include historical geology, evolution and biomineralization.