

**2010-2011 Highlight Report**  
**School of Science**  
<http://science.iupui.edu>

**Introduction (1-5 sentences):** The School of Science at IUPUI is the largest academic unit outside of the Indiana University School of Medicine on our campus. The School has an operating income of over \$50M in AY 2010–11, 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 150 full-time faculty members, of whom approximately 120 are tenured or tenure-track. During the current fiscal year, the School generated ~150,000 credit hours and is the academic home of 1,900 undergraduate and 450 graduate students. The following points represent many, but not all, of the School's accomplishments in 2010-2011.

**Teaching and Learning**

- (October 2010) [Just-in-Time Teaching, an IUPUI Innovation Now Used Nationwide](#) A student-focused web-based teaching and learning strategy developed in the School of Science is now in use on college campuses across the country, helping professors present material at a level customized to the educational backgrounds, interests, perspectives and capabilities of students in their classrooms. The strategy provides constant feedback to both teachers and students via a web feedback loop.
- (October 2010) [New Ph.D. Program in Applied Earth Sciences One of First in U.S.](#) The unique interdisciplinary Ph.D. program is among a small handful of in applied earth sciences graduate programs in the USA, offering a unique transdisciplinary perspective to contemporary problems in water quality management and human health. Study concentrations include water resources and environmental health sciences, designed to prepare individuals for teaching, research, industrial and policy careers.
- (March 2011) [School of Science Celebrates Success of Top Students](#) Over 300 students and guests were in attendance for First Annual Science Scholars Celebration at the Eugene and Marilyn Glick Indiana History Center. This celebration honored the Dean's List and Scholar's List students in addition high school students enrolled in the Special Programs for Academic Nurturing (SPAN) program.
- (April 2011) [School of Science Students Shine at IUPUI: Most Outstanding Female, Seven in Top 20, 31 in Top 100](#) Thirty one Science majors were among IUPUI's 2011 "Top 100" Students honored for their academic success, extracurricular activities, and civic engagement. Rachel Rehlander, biology major, was named as IUPUI's Most Outstanding Female Student. Kathryn E. Delacruz, Nhila Jagadeesan, and Jessica M. Rodenbeck were named as Top 10 Female Students. Dillon J. Etter, Eric Keller and Adam Miller were named as Top 10 Male Students.
- (April 2011) [School of Science Students Take Top Honors at the 2011 IUPUI Research Day](#) Biology master's student Scott Hudson (Teri Belecky-Adams' lab) won first place for his poster presentation, and Samantha Deitz (Randall Roper's lab), also a biology master's student, took second place. In the undergraduate category, psychology student Alex Lindsey (Leslie Ashburn-Nardo's lab) won first place, Biology student Melanie Day (Randall Roper's lab) took second place, and chemistry major Moonsik Chung was awarded third place for team research in the School of Engineering.

**Research, Scholarship, and Creative Activity**

- (August 2010) [Distinguished Professor Alexander Its To Speak At Prestigious International Congress Of Mathematics](#) Alexander Its, Distinguished Professor and professor of mathematical sciences, spoke at the International Congress of Mathematicians(ICM) in Hyderabad, India as one of eight invited speakers in the Analysis section. The ICM, which takes place every fourth year in different locations, is the largest and most prestigious international meeting of mathematicians.

- (August 2010) [International Recognition for IUPUI Work to Improve Breast Cancer Detection](#) A paper describing a new methodology to improve identification of breast cancer tissue by pathology laboratories co-authored by Murat Dundar, Ph.D., assistant professor of computer science, and was selected as the best scientific paper in the “bioinformatics and biomedical applications track” by the International Association for Pattern Recognition with the award presented at the 20th International Conference on Pattern Recognition in Istanbul, Turkey Aug. 23-26.
- (November 2010) [Common Diabetes Drug May Halt Growth of Cysts in Polycystic Kidney Disease](#) Pioglitazone, commonly used to treat diabetes, may also retard the growth of fluid-filled cysts of a common genetic disorder, polycystic kidney disease (PKD). In studying why this class of drugs causes fluid retention, Bonnie L. Blazer-Yost, Ph.D., professor of biology serendipitously found that it inhibits a chloride channel, inhibiting cyst formation in PKD.
- (February 2011) [Method of DNA Repair Linked to Higher Likelihood of Genetic Mutation](#) Dr. Anna Malkova in Biology and colleagues at Umeå University (Sweden) report that a method by which cells repair breaks in their DNA, known as Break-induced Replication (BIR), is up to 2,800 times more likely to cause genetic mutation than normal cell repair. The findings strongly suggest that mutagenesis caused by BIR doesn't happen slowly but occurs in surges – sudden bursts which may lead to cancer.
- (April 2011) [IUPUI Faculty Member To Receive National Innovative Vision Research Award](#) Jason S. Meyer, Ph.D., assistant professor of biology, was honored by The Association for Research in Vision and Ophthalmology (ARVO). Meyer was presented with a 2011 ARVO-AFER/Merck Innovative Ophthalmology Research Award in recognition of a study he published in the Proceedings of the National Academy of Sciences (PNAS) in 2009 that provides an important step toward the potential repair of damaged retinas by cells grown from a patient's own skin.
- (April 2011) [Highest IUPUI Undergraduate Research Award Given to Math Major for Physics Research](#) Bill Karr, graduating senior in mathematics, was named the 2011 winner of the Chancellor's Award for Outstanding Undergraduate Research recognizing his research in theoretical physics. This award is the highest recognition given to an IUPUI graduating senior for excellence in independent research.
- (June 2011) [New IUPUI Center for Urban Health Focuses on Half the World's Population](#) Global population is projected to reach seven billion within the next year, and nearly 50 percent of all people live in cities. The Center for Urban Health is a consortium led by the Schools of Science in partnership with Liberal Arts, the IU School of Medicine and its Department of Public Health, focused on improving the quality of life for individuals living in urban environments.
- (June 2011) [ACT Center Receives Distinguished Signature Center Designation](#) The [Assertive Community Treatment \(ACT\) Center of Indiana](#), hosted by the Department of Psychology, prepares mental health specialists to implement interventions that assist families dealing with mental illness. The center also serves to encourage implementation of effective and affordable support services for people with mental illness and their families. Director Michelle Salyers received a \$103,824 award from the Division of Mental Health and Addiction, Indiana Family and Social Services Administration (IFSSA) to conduct research and provide technical services regarding and ACT in Indiana.
- (June 2011) [Researchers Report Progress Using iPS Cells to Reverse Blindness](#) In a study appearing in the journal *Stem Cells*, Dr Jason Meyer (Biology) generated induced pluripotent stem (iPS) cells from a human patient with an inherited eye disease known as gyrate atrophy. Correcting the gene defect that is responsible for this disease, Dr. Meyer and colleagues then guided the iPS stem cells to become normally functioning retinal cells, providing a potential avenue for future treatments for blindness.

### **Civic Engagement**

- (July 2010) [Earth Sciences Professor Helps Public Television Program Explore Indiana Water Quality](#) Lenore Tedesco, professor of earth sciences and director of IUPUI's Center for Earth and Environmental Science, worked with WFYI on *Drop by Drop: Protecting Indiana's Water Supply*, to unlock the mysteries of where our water comes from, and where it goes once it disappears down the drain.
- (October 2010) [Symposium Will Bring Together Experts from Academia and Pharmaceutical Industry to Explore Advances in Medicinal Chemistry](#) The Indiana Medicinal Chemistry Symposium, hosted by the School of Science, brought together medicinal chemistry investigators working in Indiana and surrounding states to cover new developments in medicinal research along with topics such as translational research in universities and licensing of university research by the pharmaceutical industry.
- (February 2011) [2nd Annual IUPUI Brain Bee to Test Brain Power of Local High School Students](#) As part of the International Brain Bee, the goals of IUPUI's Brain Bee competition were to encourage high school students to learn about the brain and inspire students about neuroscience research. Enrollment in the competition doubled compared to year one of the program.
- (March 2011) [Over 80 High School Students Compete in the 2011 Computer Science Day at IUPUI](#) Students, teachers and parents from around the state gathered at the 5th annual Computer Science Day on March 18, 2011. Students competed in three groups: programming and problem solving, web development, and game development. Tasked with identifying solutions to real-life programming problems in timed competitions, the high school students developed communication and business skills as well as a deeper understanding of the fundamental ideas of computer sciences.
- (March 2011) [UCASE welcomes international group focused on science and technology education](#) The Urban Center for the Advancement of STEM Education (UCASE) at IUPUI hosted a group of educators and administrators from across the world, including Bahrain, Liberia, Russia, and Uruguay. The delegation was particularly interested in how UCASE has successfully brought together divergent areas of IUPUI to work towards improving STEM education for K-12 students.
- (April 2011) [Biology Major Rachel Rehlander Awarded the 2011 Plater Medallion for Civic Engagement](#) Rachel served the School of Science as a tutor for the biology, chemistry, and math departments and as the Resident Assistant for the Women in Science House. She is an active volunteer on and off campus for programs such as Habitat for Humanity, Alternative Spring Break, Martin Luther King, Jr. Day of Service, and Wishard Health Services, and numerous other programs.

## **Diversity**

- (July 2010) [Getting Young Scientists into the Science Teacher Pipeline](#) In the NSF Noyce Summer Internship program, science majors who enjoy and appreciate science can transfer their enthusiasm and knowledge to informal science education settings while considering a science teaching career. Eight freshmen and sophomore IUPUI science students spent eight weeks sharing their passion for science at places like The Children's Museum of Indianapolis and the Diabetes Youth Foundation Camp.
- (October 2010) [How to Say What You Feel About Your Race](#) A new study from the Department of Psychology by Leslie Ashburn-Nardo, Ph.D., associate professor of psychology, found that African Americans consciously reported that they favored their own race, identified with their own race and felt very good about themselves at a rate much higher than Caucasians. However when tested on non-conscious feelings, African Americans favored their race less and less strongly identified with their own race than did Caucasians.
- (December 2010) [Momentum for Minority Participation and Retention in Science and Engineering](#) Biology major Tomás Meijome was the first place scientific poster winner, and pre-dental biology major Kathryn Delacruz was the first place oral presentation winner.

- (January 2011) [Increasing Diversity of Future Life Science Researchers](#) Stephen Randall (Biology) and Brenda Blacklock (Chemistry) received \$943,000 from the NSF to increase the number and diversity of future life science researchers. The IUPUI Undergraduate Research Mentoring in the Biological Sciences (URM) Program, designed to broaden participation of African Americans, Hispanic Americans and members of other minority groups in undergraduate research, will concentrate on biosignaling -- the ability of life to communicate and respond to its environment.
- (June 2011) [Project Seed Expands 2011 High School Summer Research Program](#) Established in 1968 by the American Chemical Society, Project SEED (Summer Experience for the Economically Disadvantaged) gives students the opportunity to explore a career in science through mentored research. In the summer of 2011, the program expanded to host over 40 Project SEED students.

### **Best Practices**

- (September 2010) [IUPUI Receives \\$2 Million to Expand State, National Science and Technology Talent Pool](#) The award provides funding for STEM (science, technology, engineering and mathematics) summer bridge programs, peer learning support, career development, and internships targeted to boost the number of students graduating with bachelor's degrees in by 10% each year for 5 years. Associate Dean Jeff Watt directs the new Central Indiana STEM Talent Expansion Program (CI-STEP), with Science co-directors Kathleen A. Marrs, Associate Dean, and Andrew D. Gavrin, Chair of Physics.
- (December 2010) [2 + 2 Programs Deepen Ties Between IUPUI and Sun Yat-sen University \(SYSU\)](#) As part of its strategic alliance with SYSU, IUPUI is moving ahead with three new collaborative dual degree programs. These 2+ 2 programs are expected to attract over 50 students from SYSU in the fields of engineering, computer science, and informatics. After studying for two years in China, IUPUI will become the home base for SYSU students' junior and senior years. Students completing their courses of study will receive degrees from both SYSU and Indiana University or Purdue University.

### **External Awards and Appointments**

- (July 2010) [Dr. Murat Dundar and Collaborator at Purdue West Lafayette Garner \\$385,000 NIH R21 Grant](#) The project will develop a machine that automatically detects samples of bacteria using optical scans to collect data on the patterns formed by laser light scattering on these bacterial colonies, testing samples without the use of chemicals and other testing equipment. The end goal is to develop testing mechanisms that allow for the identification of bacterial outbreaks as early as possible.
- (August 2010) [School of Science at IUPUI Names New Biology Chairman](#) Cell biologist Simon J. Atkinson, Ph.D., has been named chairman and professor of biology. Atkinson comes from IU School of Medicine's Department of Medicine's Division of Nephrology and in the Department of Biochemistry and Molecular Biology. While on the medical school faculty, he directed the medical biophysics doctoral program and was the recipient of a prestigious IU Trustees Teaching Award. He also served as president of the IUPUI Faculty Council.
- (November 2010) [IUPUI Mathematician Named 2010 Indiana Professor of the Year](#) Jeffrey Xavier Watt, Ph.D., associate professor of mathematical sciences and associate dean for student affairs and outreach, has been named the 2010 Indiana Professor of the Year. Sponsored by the Carnegie Foundation for the Advancement of Teaching, the U.S. Professor of the Year award is one of the most prestigious awards honoring undergraduate teaching and mentoring.
- (September 2010) [Record Number of New Faculty at IUPUI's School of Science](#) The School of Science welcomed sixteen new faculty members, including new department chairmen in biology and earth sciences. The new faculty came Memorial Sloan Kettering Cancer Institute, Yale and Harvard Universities, Colorado School of Mines, IU School of Medicine, and eBay Research Labs. Six of the School of Science's seven departments have named new faculty.

- (September 2010) [Computer Science Receives \\$250,000 Grant to Develop 3-D Criminal Investigation Technology](#) Mihran Tuceryan and Jiang Yu Zhen were awarded grant from the National Institute of Justice for their project entitled *Digitizing Devices to Capture Track Impressions*. The grant will result in a device that can capture 3D digitized images of impression evidence, such as foot and tire impressions, at crime scenes to better identify and aid in the identification and capture of criminal suspects.
- (September 2010) New Awards in the Department of Mathematical Sciences: Dr. Alexander Its receives an NSF award (\$177999) for research on: “Some Analytic Aspects of the Theory of Integrable Systems”, and Dr. Paul Bleher receives an NSF grant (\$110,000) for his research project titled: “Random matrix models and their applications to statistical mechanics”. 09/15/2010-8/31/2012.
- (October 2010) [New NSF Grant for Interactive Community Computer Simulation To Restore Watersheds](#) Researchers Meghna Babbar-Sebens, Earth Sciences, and Snehasis Mukhopadhyay, Computer & Information Science, have received a \$410,000, three-year award from the NSF to design an interactive computer simulation to be part of a collaborative watershed restoration project.
- (December 2010) [School of Science Names Associate Dean for Research and Graduate Education](#) David G. Skalnik, Ph.D., is a professor of pediatrics and of biochemistry and molecular biology at the IU School of Medicine. A leader the field of epigenetics, the study of factors influencing the behavior of gene function that do not involve changes in the structure of DNA, Skalnik’s research focuses on how proteins control how DNA segments are turned on and off – both appropriately and inappropriately.
- (March 2011) [Simon Rhodes Selected as Dean of School of Science](#) Rhodes, associate Dean for Research and Graduate Studies in the IU School of Medicine as well as professor of Cellular and Integrative Physiology and Biochemistry and Molecular Biology, assumed his new position 1 July 2011.
- (March 2011) [Six Indiana University Collaborative Research Grants Awarded To School of Science Faculty](#) Of the 18 system wide IU Collaborative Research Grant (IUCRG) grants awarded, six grants worth over \$250K went to School of Science faculty: Gabe Filippelli (Earth Sciences), Giovanna Guidoboni (Mathematical Sciences), Adam Hirsh (Psychology), Jiliang Li (Biology), Lei Li (Chemistry & Chemical Biology) and Jason Meyer (Biology).
- (April 2011) [IUPUI Receives \\$250,000 in first round of Next Generation Learning Challenges Funding](#) Pratibha Varma-Nelson, professor of Chemistry and executive director of the Center for Teaching and Learning at IUPUI will identify and expand innovative technology-enabled approaches that improve college completion in the United States. Efforts at IUPUI will focus on cyber-PLTL, an expanded version of the successful Peer led Team Learning (PLTL) program in the School of Science.
- (April 2011) [Kathy Johnson Appointed Dean of University College and Associate Vice Chancellor for Undergraduate Education](#) Johnson, professor and former Chair of the Department of Psychology, started her new position on July 1, 2011. She brings special skills to her new position, including training as a cognitive developmental psychologist and a career as a researcher that has been devoted to questions pertaining to how individuals learn and construct knowledge throughout their lifespan.
- (May 2011) [IUPUI Study First to Look at Early Treatment of Depression to Reduce Heart Disease](#) Jesse Stewart, Ph.D., assistant professor of psychology and an IU Center for Aging Research affiliated scientist, has received a \$110,000 grant from the American Heart Association to explore whether treatment of depression can reduce the likelihood of future heart disease.
- (May 2011) [IUPUI Behavioral Neuroscientist Receives International Award for Alcoholism Research](#) Stephen L. Boehm II, Ph.D., associate professor of psychology in the School of Science has been named the 2011 Young Scientist of the Year by the International Behavioral and Neural Genetics Society. The award was presented May 13 at the society’s annual meeting in Rome, Italy.

- (June 2011) [School of Science at IUPUI Names New Associate Dean for Planning and Finance](#) N. Douglas Lees, Ph.D., former chair of the Department of Biology, work with the dean in allocation of faculty, staff, and other personnel lines and financial, facility, and program resources. He will also assist with annual budget planning and assessment as well as fiscal policy development.