From the Dean

Welcome back to Science@Purdue, the "serious" version. Judging by the e-mails I received, you all enjoyed our April Fool's edition, and I'm very pleased to hear that. Last month, I joked about the curriculum revision, but in all seriousness, I was very pleased to have the College of Science faculty approve the revision in early April.

The faculty approval marks the end of the first phase of the revision, which began in 2003, but also the beginning of the second phase, the implementation. This new curriculum, which is based on six important educational outcomes, will make our students even more competitive and successful in their future careers, since they will enter the working world with the critical thinking abilities, collaborative know-how, and communication skills that are so integral for success. And as lifelong learners, they will have the theoretical foundation to adapt to—and create—the many changes of the future. The new curriculum also encourages study abroad and international exposure, research experiences, and double majors and minors.

The curriculum approval came shortly after another big moment at Purdue—the announcement of the $100 million Al Mann Institute for Biomedical Development. The institute, which is a joint initiative between Purdue and the Al Mann Foundation, will help faculty commercialize their research, with special consideration for companies located in Indiana. One of the strong selling points of Purdue was Discovery Park and the strong entrepreneurial spirit at Purdue. For example, the last three winners of Purdue's Outstanding Commercialization Award—chemistry distinguished professors Graham Cooks, Fred Regnier, and Phil Low—played major roles in the successful planning and site visit.

The Mann Institute is yet another example at Purdue of the growing importance of multidisciplinary research and education. Many of our most salient problems—from the energy crisis to the war on cancer—are not specific to any one discipline. Solving them will require deep insights and
during our strategic planning process, the College of Science established its seven multidisciplinary COALESCE areas of priority for faculty growth. Starting next year, we plan to continue the multidisciplinary momentum from the COALESCE program by identifying compelling priorities for future hiring focus. The planning committee is currently collecting vision papers that address major scientific and societal issues; they will be vetted in an all-day College-wide retreat on May 9. Departments will have the opportunity to leverage College hiring slots to build critical mass for addressing these areas of opportunity. I look forward to updating you on our progress.

Sincerely,
Jeff Vitter

SPOTLIGHT ON NEW FACULTY

John Staver

John Staver, formerly at Kansas State University, came to Purdue in August as professor of curriculum and instruction (education) and chemistry and co-director of the Center for Research and Engagement in Science and Mathematics Education (CRESME). CRESME is a collaborative partnership between Purdue's College of Education and College of Science. Its mission is to study the learning process and improve science and mathematics education on campus, statewide, and beyond at the P–12, undergraduate, and graduate levels. John is active in the Indiana Science, Technology, Engineering, and Mathematics (I-STEM) Resource Center, a statewide collaborative partnership that seeks to increase K–12 student achievement in STEM disciplines and improve student attitudes toward STEM education.

John earned a BS in education from Indiana University (1968), an MS in chemistry from Purdue University (1973), and an EdD in science education from Indiana University (1978). He taught high school students chemistry for seven years in Indianapolis. Before joining the Purdue faculty, Staver held faculty appointments at DePaul University, University of Illinois at Chicago, and Kansas State University. John's research and scholarship focus on constructivist epistemology and its implications for improving science teaching and learning. He also examines the interface between science and religion within
Daniel Szeto

Daniel Szeto joins the Department of Biological Sciences as an assistant professor of biological sciences. Daniel uses zebrafish (Danio rerio) as a model system to understand how a population of progenitor (stem) cells in the mesodermal region of an embryo is regulated to give rise to a variety of tissues including body musculature, heart, kidney, blood, and demis. The different cell-fates of the mesodermal progenitor cells (MPCs) are spatially and temporally regulated by the cooperation of multiple intracellular signaling pathways that include members of the Transforming growth factor-beta (TGF-b) superfamily, Bone morphogenetic protein (Bmp), and Nodal. While most studies to date have focused on the role of a single signaling pathway in normal processes and disease, cells in the embryo and adult are responding to multiple signals. His work is to determine how Bmp and Nodal signaling pathways function cooperatively to regulate the survival, proliferation, and migration of the MPCs in forming the body musculature. The insights from these studies will enhance our current understand on the genetic and molecular bases for human birth defects and diseases.

A second major interest in his laboratory is to understand the roles of a family of T-box transcription factors that function downstream of these signaling pathways to regulate the development of the MPCs during embryogenesis and organogenesis. He is currently working with six different T-box genes: tbx5, tbx6, tbx20, tbx24, no tail, and spadetail. The goal is to determine how these transcription factors are regulated and function during heart, blood and body musculature formation. Visit Daniel's Web page

SCIENCE PEOPLE

Francisco honored with Purdue's top research award

As a teenager, Joseph Francisco wasn't even sure he'd go to college. Today, he's a distinguished professor and is now the recipient of the University's top research honor. Joseph Francisco, the William H. Moore Distinguished
the 2007 Herbert Newby McCoy Award. The McCoy Award is given to a student or faculty member in the science departments of Purdue University making the greatest contribution of the year to science. Since the first award was conferred in the spring of 1965, it has remained the most prestigious research award given by the University in the science area. Francisco holds a dual appointment in Chemistry and in Earth and Atmospheric Sciences, and specializes in atmospheric chemistry. Francisco has worked with chlorofluorocarbons (CFCs), mapping the path of a lesser-researched compound and creating a new class of fluorinated radicals. More recently, his work has focused on illuminating the role clouds play in the chemistry of the atmosphere. But it all started with an early Sunday supper and chance meeting, as he told us last year. For more about the McCoy Award, please click here.

**Hrycyna's passion for teaching excellence honored with the Murphy Award**

Christine Hrycyna loves to teach. And her students love being in her classes. Last month, Purdue recognized this passion and excellence in teaching by awarding Hrycyna, a professor of chemistry, the 2007 Charles B. Murphy Award for Outstanding Contributions to Undergraduate Teaching. The Murphy will be added to a long list of teaching awards Hrycyna has received since coming to Purdue in 2000, including the Teaching for Tomorrow Award; Arthur E. Kelley Undergraduate Teaching Award; the 2003 Outstanding Teacher of Undergraduates in the College of Science; and elected to the Top 10 Teachers of the Year. Students consistently give her biochemistry classes very top marks. "I care deeply about undergraduate education, and I enjoy my interactions with students both in and out of the classroom as well as in my laboratory," Hrycyna says. Full Story

**College honors ten distinguished science alumni**

Ten science alumni and their families gathered on April 6 for the Distinguished Science Alumni Awards, which honors select alumni in the College of Science for their tremendous contributions and successful careers. Since the inception of the awards in 1990, the college has honored 145 alumni out of a total of more than 31,000 living alumni. This year's awardees span a variety of fields, from law to academia. Meet this year's ten awardees. See the news release here.

**Three departments honor outstanding alumni**
Statistics, Actuarial Science, and Computer Science all honored outstanding alumni at the end of March. Beginning in fall 2007, all Outstanding Alumni Award celebrations will be moved to the fall season, so stay tuned! Meanwhile, you can meet these outstanding alumni [here](http://c89.science.purdue.edu/sites/enewsletter/may2007/).

**Trustees approve named professorship for Shipsey**

At the Board of Trustees meeting on April 13, Ian Shipsey was named the Julian Schwinger Distinguished Professor of Physics. Julian Schwinger, for whom the professorship is named, was a particle physicist and physics instructor at Purdue from 1941–1945 and shared a Nobel Prize in 1965 with Richard Feynman and Shin-Itiro Tonomaga for the development of quantum electrodynamics, the theory that describes how light and matter interact.

Shipsey joined the Purdue faculty in 1990 and is internationally known for his work in particle physics. He has made major contributions to the understanding of the properties of subatomic particles, especially charm and beauty quarks, the study of how matter and antimatter differ, and the construction of the specialized apparatus used to perform these measurements. [Full Story](http://c89.science.purdue.edu/sites/enewsletter/may2007/)

**Helping Students Learn Award**

Gabriela Weaver, an assistant professor of chemistry, was awarded the Helping Students Learn Award for her work in CASPiE. One of Weaver's projects that has received a lot of attention recently is her work with Purdue's computer and graphics technology department in creating a video game to help reinforce chemistry concepts. [Full Story](http://c89.science.purdue.edu/sites/enewsletter/may2007/)

**American Chemical Society presents two awards to Purdue chemists**

Purdue chemists Scott McLuckey and Garth Simpson were both honored with major awards from the American Chemical Society this spring. McLuckey was awarded the Division of Analytical Chemistry Award in Chemical Instrumentation. [Full Story](http://c89.science.purdue.edu/sites/enewsletter/may2007/)
the Division of Analytical Chemistry

Arthur F. Findeis Award for Achievements by a Young Analytical Scientist. Both McLuckey and Simpson are part of Purdue's highly-ranked analytical chemistry division. 

Full Story

Chemistry professor presents meteorite research to American Chemical Society

Michael Lipschutz, a professor of inorganic chemistry and cosmochemistry, gave a presentation titled "Lessons from Meteorites" at the American Chemical Society national meeting in Chicago. His presentation featured information from a chapter he authored in the new *Encyclopedia of the Solar System* (Academic Press).

"Meteorites are the poor man's space probe," Lipschutz said. "They offer otherwise unobtainable information and contain the oldest known materials. Some contain materials created before the solar system was formed and illustrate processes that occurred 4.56 billion years ago. No other accessible material provides such information, and they are delivered right to us."

Full Story

Little molecule holds big hope for Alzheimer's research

A molecule designed by Arun Ghosh, professor of chemistry, could lead to the first drug to fight Alzheimer's. The new molecule prevents the first step in a chain of events that leads to amyloid plaque formation in the brain. "There are many people suffering, and no effective treatment is available to them," says Ghosh. "There is an urgent need for a drug to treat this devastating disease, and the scientific community has been working on this problem for many years."

The material at various stages of plaque formation is made up of fibrous clumps of toxic proteins that cause the devastating symptoms of Alzheimer's disease, said Ghosh, who has a dual appointment in the chemistry and medicinal chemistry and molecular pharmacology departments. Full Story

Fischbach publishes paper on Newton's second law

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recently published his work on Newton's second law for small accelerations in the journal Physical Review Letters. In the research, Fischbach and his team were able to measure Newton's second law at smaller scales than ever before.

"We now know that \( F = ma \) is valid in a laboratory down to very small accelerations. This means that the anomalies described below cannot be routinely "blamed" on a failure of this law unless a theory for them is developed which explains these anomalies while at the same time preserving \( F = ma \) in laboratory experiments such as we just published. This is an important constraint on such theories," says Fischbach. Full Story

Frederickson publishes third book, Time to Fold!

Greg Frederickson, professor of computer science, recently had his third book of dissections published by A. K. Peters. Like his first two books, Dissections Plane & Fancy and Hinged Dissections: Swinging & Twisting, the book shows readers how to create complicated paper folds. The 2006–2007 Computer Science graduate brochure was based on one of Frederickson's dissections. For more information and to view a sample dissection, please visit the CS Web site. Full Story

One Farm, Many Silos work for Purdue's CCO

Silos are a fitting analogy for a land-grant university like Purdue, where the size of the campus can lead to some decentralization. But Purdue's Center for Career Opportunities has used this concept to help students get jobs. And this summer, Science CCO Director Cher Yazvac will present this workshop, "One Farm, Many Silos: Creating Career Center Connections" at the annual conference for the National Association of Colleges and Employers (NACE) in New York City.

Math professor honored in hometown of Mumbai

Shreeram Abhyankar, a professor of mathematics and computer science, was honored in his home city of Mumbai, India. He received the honorary title of "Vidnyan Sanstha Ratna" by the Institute of Science in Mumbai and his name was carved
ACM honors Spafford's long and effective service

Eugene Spafford, professor of computer science and executive director of the Center for Education and Research in Information Assurance and Security, was recognized for his long and effective service on security and policy issues with the Association of Computing Machinery's (ACM) President's Award. The award honors unique contributions to the computing community. Full Story

Departments honor a year of hard work

'Tis the time of year to recognize individuals who shone particularly brightly this academic year. Click here to view our department award winners.

SCIENCE NEWS

Science faculty approve innovative undergraduate curriculum

After four years of intense review, the College of Science faculty approved the undergraduate curriculum revision in early April. The new outcomes-based curriculum provides added flexibility for students to meet requirements via a matrix of options that include courses, experiential learning such as research projects and internships, and study abroad programs. Full Story

Tomorrow's scientists show their best work at the Undergraduate Research Poster Symposium

If today's students are tomorrow's future, then the future is bright. Hundreds of students, faculty, and visitors turned up for the April 4th Undergraduate Research and Poster Symposium. The symposium is sponsored and organized by the College of Science, but students from all over Purdue participate in it. View all of the award winners.

Giving biomedicine a boost: Purdue announces the Alfred Mann Institute for Biomedical Development
Many lifesaving advances have come from biomedicine and Purdue is betting that many more will. In March, Purdue announced the creation of the $100 million Alfred Mann Institute for Biomedical Development. The university-based institute is designed to enable the commercialization of innovative biomedical technologies that improve human health. Purdue already has the capacity to produce such innovations. Chemists Fred Regnier, Phil Low, and R. Graham Cooks have all been very active in biomedical development. The research has launched two companies —Quadraspec and Endocyte—and Cooks' has been picked up by Griffin Analytical. Full Story

Biologists learn structure of enzyme needed to power 'molecular motor'

Researchers at Purdue University, including structural biologist Michael Rossmann, and The Catholic University of America have discovered the structure of an enzyme essential for the operation of "molecular motors" that package DNA into the head segment of some viruses during their assembly. Full Story

Nolte uses holographic images to view tumor response to drugs

A team of scientists including David Nolte, professor of physics, have created holographic 3-D imagery to observe the body's cellular response to the use of anti-cancer drugs. The new digital imaging technology developed at Purdue University uses a laser and a charged coupling device—the same type of microchip used in household digital cameras—to see inside tumor cells. "This is the first time holography has been used to study the effects of a drug on living tissue," says Nolte. The work was presented at the American Physical Society meeting in Denver, CO. Full Story

Rossmann's truly groundbreaking research

Michael Rossmann, the Hanley Distinguished Professor of Biological Sciences, has long been known for his...
experiment in Rossmann's lab was truly groundbreaking. Last week, the department notified the college that they had broken ground—in their lab. Rossmann's new headquarters, the Hockmeyer Hall of Structural Biology, is only expected to permit groundbreaking research in the figurative sense, not the literal one.

**Purdue University Research Database poised for expansion**

Visit the Purdue University Research Database, or PURE, developed by the College of Science, and you'll notice it has expanded. The database now includes faculty from every college and school at Purdue and continues to expand. "PURE crosses all college and departmental boundaries to provide a uniform view of its faculty expertise to assist in a variety of multidisciplinary collaborations," said Jeffrey Vitter, Frederick L. Hovde Dean of Science, who first conceived the project. [Full Story](#)

**Finding the art in science—and vice versa**

It's a whole new way of discovering science fun. Co-led by Physics Outreach Coordinator Julie Conlon and started with a Discovery Learning Center seed grant, the project, "The Impact of Performing Arts on Science Learning," looks at how the arts can get students excited about science. [Full Story](#)

**Science, spring, and ... snow?**

Yes, it snowed for SpringFest two weeks ago. But in spite of any seasonal confusion on Mother Nature's part, many families, alumni, and community members turned out for SpringFest 2007. The Science tent was particularly busy, with Science Kids Club members exploring liquid nitrogen ice cream, hurricanes and tornadoes, and more. [Full Story](#)

University cameras also captured the fun.

**PURDUE NEWS**

Many Purdue programs rank highly in *U.S. News & World Report*. [Full Story](#)

Research could lead to treatment for Alzheimer's disease. [Full Story](#)

New imaging approach promises insights into multiple sclerosis. [Full Story](#)

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Carbon Neutrality at Purdue class. Full Story

President Jischke statement on Virginia Tech tragedy. Full Story

Purdue Energy Center symposium. Full Story

Holographic Images show cellular response to anticancer drug. Full Story

Scientists invent real-life tricorder. Full Story

**SCIENCE EVENTS AND CALENDAR**

May 2, 5:30 p.m.: Business Roundtable for current and potential entrepreneurs. More information.

May 3–4: Dean's Leadership Council Spring Meeting.

May 8: Workshop and Reception for Newly Promoted Faculty (By Invitation Only).

May 9, 7:45 a.m.: All day faculty retreat for multidisciplinary strategic planning, BRNG 2280.

May 12, 2:30 p.m.: Spring Commencement, Elliott Hall.

May 12, 4:30 p.m.: Graduation reception, Lawson Computer Science Building atrium.

May 14: Lonergan business roundtable in Palo Alto, CA, with Dean Vitter.

June 12–July 3: Day on Campus for incoming freshmen. Click here for advising and registration information.

June 17–22: ScienceScape summer camp.