

Dear Indiana STEM Teachers,

The following is a fall update about opportunities in STEM education at Discovery Park and Purdue. These opportunities include events for teachers and students.

Please share these opportunities with your students and colleagues!

If you have any questions or comments please contact us.

Best wishes for a great school year!

Chris Foster

Director of P-14 STEM Programs at Discovery Park

<http://www.purdue.edu/dp/p12stem/>

2010 Updates:

NEXTRANS High School Internship in Transportation

<http://www.purdue.edu/discoverypark/nextrans/edu/k12.php>

Headquartered at Purdue University, the NEXTRANS Center is one of ten Regional University Transportation Centers selected competitively by the U.S. Department of Transportation to serve as leaders in meeting the nation's need for safe, efficient, and environmentally-sound transportation systems.

The Center is currently seeking qualified applicants for the NEXTRANS High School Internship in Transportation. This program provides qualified students with the opportunity to complete a 4-6 week program of research and activities at Purdue University. Participants will be exposed to the field of transportation through hands-on research activities under the guidance of a NEXTRANS Research Assistant. By fostering a challenging environment in which students learn through discovery, the Center hopes to attract a new generation of leaders to transportation-related careers.

Applications are accepted on a rolling basis, and each 4-6 week program is scheduled to suit the individual student's needs. Students will work approximately 20 hours per week at the NEXTRANS Center, and will be compensated for their time (\$8-10 per hour). Applicants should live in close proximity to the West Lafayette / Purdue University area.

To apply, or for additional information, please contact Jessica Mehr via email jmehr@purdue.edu, or phone 765-496-9734.

To learn more about NEXTRANS, visit www.purdue.edu/discoverypark/nextrans

Purdue zipTrips

An innovative program to create science-based electronic field trips for students in grades 6–8. These field trips use technology to provide virtual visits to the West Lafayette campus, where students will meet scientists from Purdue’s School of Veterinary Medicine, Purdue Agriculture, and Discovery Park, and learn first-hand about their work. Purdue zipTrips is funded by a grant from the Howard Hughes Medical Institute.

Visit www.purdue.edu/ziptrips to learn more.

Indiana Space Grant Consortium

The Indiana Space Grant Consortium (INSGC) includes 23 affiliates who work together to promote STEM education initiatives related to NASA themes and careers in the State of Indiana. Purdue University in West Lafayette, IN, serves as the INSGC lead institution under the direction of Dr. Barrett Caldwell.

Please see website for more details and opportunities. <http://www.insgc.org>

For questions contact: insgc@purdue.edu

Other Purdue Opportunities:

Bringing the World to Everyone: Internationalizing Low-Income Schools for Success in the Global Economy

Contact: Nadine Dolby, College of Education, ndolby@purdue.edu

Request for Partners:

Partners in STEM and/or business disciplines are sought for a project that integrates technology, academic success in STEM and related disciplines, and the development of global competencies.

The majority of efforts to internationalize schools and curriculum are focused on relatively well-funded private and suburban school districts, with resources for technology, teacher development, and materials. In low-income rural and urban schools with limited resources, international education is rarely considered a key component of educational practice.

These inequities place low-income children at an even greater disadvantage, as they will lack the skills, knowledge, and attitudes of global competence, which is a necessary component of preparation for success in the global economy.

Nadine Dolby
Associate Professor of Curriculum Studies
Purdue University
BRNG 4146

Making sense of global warming and climate change

PI: Anita Roychoudhury (Science Education)

Co PIs: Dan Shepardson (Science Education and Earth and Atmospheric Science), Andrew Hirsch (Physics), Dev Niyogi (Earth and Atmospheric Science: Climatology), Brenda Capobianco (Science Education)

We have received funding from the National Science Foundation to study how middle school students learn complex science topics. We have chosen global warming and climate change as the theme for our study for two reasons:

1. It is a critical issue of the day;
2. It is also a complex issue that requires students to connect many topics that they learn in the middle school physical, life, earth, and environmental sciences.

We are studying how 7th and 8th grade students learn these topics. We would like to recruit control groups where global warming and climate change are not taught or not taught extensively.

The responsibility of the control group teacher is to help us distribute the permission forms to the students and subsequently administer a content and attitude scale at the beginning and end of the academic year. For this assistance each control group teacher will receive \$100. Please contact the Project PI, Anita Roychoudhury (aroychou@purdue.edu; Ph: 765-496-3920).

Center for Compact and Efficient Fluid Power – NSF – Portable Water Hydraulic Demonstrator and Curriculum

The goal of this project is to develop a demonstration kit and accompanying activity-based curriculum that teaches the basics of fluid power in a way that is complex enough to provide challenging learning experiences for teachers and students, yet simple enough to be economical, reliable and portable. The design and construction of the kit is finished and curriculum development for students in grades 8-12 is underway. The kit includes materials needed to assemble a complete working micro-excavator, using water hydraulics or pneumatics that can be built and implemented in classrooms or hands-on displays. Fabrication instructions for the apparatus have been developed for dissemination throughout CCEFP and its member companies.

Website: <http://www.ccefp.org/education-outreach/pre-college-education/b3>

For questions: Jill Wable at jwable@purdue.edu

Lugar-Purdue Future of Forestry Program and Scholarship

Do you know a student interested in forestry, or an ag or science teacher? Purdue University and Richard Lugar, U.S. Senator and woodland owner from Indiana, are teaming up to show students just how exciting the science and management of forests can be. We're asking high school agricultural education and science teachers to recommend and sponsor qualified students in grades 9-11 for the Lugar-Purdue Future of Forestry Program.

Students take an online course about basic forest science and plan and conduct an independent research project under adult supervision. Upon completion they take away a better knowledge of forest science, an award certificate from Senator Richard Lugar, and consideration for the \$3,000 Future of Forestry Program Scholarship in Purdue's Department of Forestry and Natural Resources.

Please share information on this program with local high school teachers or students. For more information, see www.aq.purdue.edu/fnr/Lugar/Pages/default.aspx.

Announcements

This is a fantastic opportunity for junior and senior high school students to hear [Dr. Aaron Ciechanover](#), 2004 Nobel Prize Laureate in Chemistry, and Professor at the Cancer and Vascular Biology Research Center, Faculty of Medicine, at Technion-Israel Institute of Technology.

Please contact Valerie Lawless (lawless@purdue.edu ; phone: 494-3662) to schedule your class visit.

General Lecture

Purdue University, 10 November 2010

10:30-11:45am in Stewart Center – Fowler Hall

**TALK TITLE: Drug Development in the 21st century:
 Are we going to cure all diseases?**

ABSTRACT:

Many important drugs such as penicillin, aspirin, or digitalis, were discovered by serendipity - some by curious researchers who noted an accidental phenomenon, some by isolation of active ingredients from plants known for centuries to have a specific therapeutic effect. Other major drugs like statins were discovered using more advanced technologies, such as targeted screening, yet, the discoverers were looking for a different effect. In all these cases, the mechanisms of action of the drug were largely unknown at the time of their discovery, and were discovered only later. With the

realization that not all patients with diseases that physically and histopathologically appear to be the same - different malignancies for example - respond similarly to treatment, and their clinical behavior is different, we have begun to understand that their molecular basis is distinct. Accordingly, we are exiting the era where our approach to treatment is “one size fits all”, and enter a new one of “personalized medicine” where we shall tailor the treatment according to the patient’s molecular/mutational profile. Here, unlike the previous era, the understanding of the mechanism will drive the development of the new drugs. This era will be characterized by the development of technologies where sequencing and processing of individual genomes will be cheap (US\$ <1,000) and fast (a few minutes), by identification and characterization of new disease-specific molecular markers and drug targets, and by design of novel, mechanism-based, drugs to modulate the activities of these targets. It will require a change in our approach to scientific research and development and to education, where interdisciplinarity will domineer and replace in many ways the traditional, discipline- oriented approach.

Resources available at Discovery Park:

Network for Earthquake Engineering Simulation Operations (NEES):

The NEES Community includes researchers from across the nation designing and running experiments at the fourteen geographically distributed test facilities. The resulting network contributes research results to inform the codes and designs of safe structures. Much has been accomplished toward these goals since the formation of NEES in 2004. The knowledge and understanding gained through this network is critical to designing resilient communities that will survive earthquakes and recover quickly in the aftermath.

<http://www.nees.org>

Education, Outreach & Training Coordinator: Barbara Cooper, bccooper@purdue.edu, 765-494-6519

Purdue Homeland Security Institute

A project in data visualization for classrooms.

Visit us at: <http://www.purdue.edu/dp/phsi/>

Discovery Park Science Education Resources, K-12 Teachers:

Programs at Discovery Park with resources for teachers.

<http://www.purdue.edu/discoverypark/learningcenter/resources/index.php>

Tours of Discovery Park

Have you and your class been to Purdue University's newest research facilities? We would like to invite you to take a tour.

<http://www.purdue.edu/discoverypark/main/scheduleTours.php>

Teacher Links

National Science Teacher's Association

<http://www.nsta.org/?lid=logo>

STEM Education Resource Center

<http://www.pbs.org/teachers/stem/>

National Science Digital Library

http://nsdl.org/collection/stem-education/?set_css=large

Additional Links

<http://www.stemresources.com/>

<http://www.caseforlearning.com/>

Classroom Projects

McGinley Plaza Information

McGinley Plaza Dedication

<http://www.purdue.edu/uns/x/2009b/090710McGinleyPlaza.html>

We hope this information will be of use to you. Please send your comments and suggestions to Lana Rice (lkrice@purdue.edu).

Christian Foster

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