

# ABSTRACTS



PHOTOS: KEITH KRUMWIEDE

LEFT: NJIT's Thomas Dallessio and Darius Sollohub (left and center) speaking with John Camera, Seaside Heights Borough administrator, about recovery after Hurricane Sandy.

BELOW: Kenneth Schwartz, dean of the Tulane School of Architecture, joined the NJIT faculty members assessing damage caused by Hurricane Sandy at the New Jersey shore.



## NEW JERSEY STRONG: POST-SANDY RECOVERY

NJIT's College of Architecture and Design (COAD) is energetically involved in helping New Jersey recover from the devastation of Hurricane Sandy. The university has established a post-Sandy recovery program of research, design and case-study projects that will provide state and local leaders, business owners and residents with 21st-century expertise and ready-to-build designs for recovery in hard-hit areas.

At the outset, the focus will be on three initiatives: developing resilient "prototypologies" – practical designs for housing, mixed-use development and public buildings; creating a Center for Resilient Design and a clearinghouse for other academic institutions, businesses and non-government organizations to share information, expertise and assistance; and organizing "(Re)Build New Jersey Strong," a weeklong community service project during spring break 2013 when

NJIT students, faculty and alumni will help residents, businesses and local officials rebuild in a resilient manner. These initiatives will help residents, businesses and communities recover more quickly, build capacity for resilient design and create new opportunities for products and services that are "New Jersey Strong."

Thomas Dallessio, COAD adjunct professor and licensed professional planner, is the Resilient Design project manager, under the guidance of lead investigators

Professor Urs Gauchat, COAD dean, and Professor Darius Sollohub, director of New Jersey School of Architecture. On November 30, Dallessio, Sollohub and COAD colleague Associate Professor Keith Krumwiede were joined by Kenneth Schwartz, dean of the Tulane School of Architecture, at meetings with city officials in Perth Amboy and Seaside Heights. Jason Heller of the Beckerman Antenna Group arranged the meetings.

Going forward, NJIT anticipates funding for a new commitment to civic engagement by faculty and students to develop designs and construction techniques that will better withstand natural disasters such as hurricanes and flooding on

barrier islands and at other shore areas, as well as in urban and suburban New Jersey. Short- and long-term goals will complement work under way by federal, state and local governments, nonprofit organizations and civic entities to protect the

environment and enhance the quality of life along the shore, in Newark, and in Bergen and Hudson counties.

In cooperation with the U.S. Department of Housing and Urban Development, NJIT intends to build a network of engaged professionals and expand its research, planning and implementation efforts to serve as a clearinghouse for innovation that will not only rebuild in a more sustainable manner, but also export architectural ideas and products that will address natural disasters.

Look for more about NJIT's commitment to post-Sandy recovery in future issues of *NJIT Magazine*. ■

<http://design.njit.edu/news/resilientdesign.php>

*AAC is a lightweight manufactured stone strong enough to withstand hurricanes and earthquakes when reinforced with steel that is widely used in other countries.*



PHOTO: JED MEDINA

## A CONCRETE PROPOSAL

Rebuilding in the aftermath of Hurricane Sandy leads Assistant Professor Mohamed Mahgoub to suggest autoclaved aerated concrete (AAC) as an ideal addition to the list of materials needed for reconstruction. AAC is a lightweight manufactured stone strong enough to withstand hurricanes and earthquakes when reinforced with steel that is widely used in other countries.

AAC can be used as roof, floor, vertical or horizontal wall panels, shaped into blocks and more, says Mahgoub, who is coordinator of NJIT's Concrete Industry Management (CIM) program. It is also an environmentally friendly building solution, which can be easily worked, provides outstanding thermal insulation and is resistant to fire, termites and decay.

At present, more than 300 plants worldwide produce AAC, which consists of finely ground sand, cement, quick lime, gypsum, aluminum and water. There is one manufacturer in the U.S., in Florida, and a New Jersey plant is in the planning stage.

NJIT's CIM program addresses the growing need for professionals in the concrete industry. Part of a special curriculum in the Department of Engineering Technology, the program prepares students with a broad range of knowledge and skills in concrete technology and construction management. ■

<http://engineeringtech.njit.edu/academics/cim>

There's more online – visit NJIT Magazine at <http://magazine.njit.edu>

## STRENGTHENING TIES IN CHINA

A group of NJIT emissaries boarded United Flight 89 last fall for a whirlwind journey to China to foster mutually beneficial cooperation that has been growing in recent years. Virtually every day of their stay in the Far East was filled with meetings and appointments.

The intrepid travelers visited six cities in China, logging more than 18,000 air miles over ten days. The team focused on building relationships with Chinese alumni, and making contacts that could lead to new business opportunities, academic alliances and more applicants for NJIT graduate programs. ■

Read more at <http://magazine.njit.edu/china2012>



Photographed at Changzhou National University Science Park (front from left): Jingong Pan, '03, '09; Charles R. Dees, Jr., NJIT vice president for advancement; Donald Sebastian, NJIT senior vice president for research and development; Diane Bloom; Joel S. Bloom, NJIT president; Chaohui Zhang, deputy director of Changzhou Science and Education Town; Xin Tang, '02; Lin Yang, party director of the School of International Education and Exchange of Changzhou University; Shoukun Xu, dean of the School of International Education and Exchange; (rear, starting third from left) Richard Garber, associate professor, NJIT College of Architecture and Design; Yuan Huang, vice director of Changzhou Science and Education Town; Huaxue Zhang, president of Changzhou Hi-tech Ventures.

*"The students and I are tremendously excited about the competition and we feel our design, which we call Nexus House, is a great opportunity to showcase our university's talents on the world stage."*

— Associate Professor Richard Garber

## RESPECTING THE PAST, BUILDING A SUSTAINABLE FUTURE

NJIT and Harbin Institute of Technology have formed Team NJHA to participate jointly in the Solar Decathlon China (SD China) competition to be held in that country in August. NJIT students involved are enrolled in the College of Architecture and Design (COAD). With teams from 37 universities in 13 countries selected to compete, NJIT's participation reflects the university's growing international recognition.

SD China challenges the teams from around the world to design, build and operate solar-powered, energy-efficient houses. Co-hosted by the China National Energy Administration and the U.S. Department of Energy, the competition has been organized by Peking University.

"The students and I are tremendously excited about the competition and we feel our design, which we call Nexus House, is a great opportunity to showcase our university's talents on the world stage," says Associate Professor of Architecture Richard Garber, faculty advisor to the NJIT students.

Nexus House is a transitional home for families living in areas



COURTESY OF TEAM NJHA

A Nexus House conceptual illustration.

of China on the brink of rapid urbanization. It introduces state-of-the-art home technology and functionality while preserving an agrarian sensibility and respecting the customs of rural Chinese society.

Incorporating innovative passive design approaches to power, water and air, Nexus House has a roof that maximizes resource collection and production. It also has a socially-minded layout that centers on family life, connects street life with family life, and sustains both.

COAD partnered with Rutgers-The State University of New Jersey in the 2011 U.S. Department of Energy Solar Decathlon held in Washington, D.C. Team New Jersey's entry, eNJoy: A Generation House, involved a multi-year collaborative effort to design and construct a solar-powered home that was cost-effective, energy-efficient and attractive. More than a dozen graduate and undergraduate students labored on it, some even returning after graduation to take part. ■

[www.nexushouse2013.com](http://www.nexushouse2013.com)

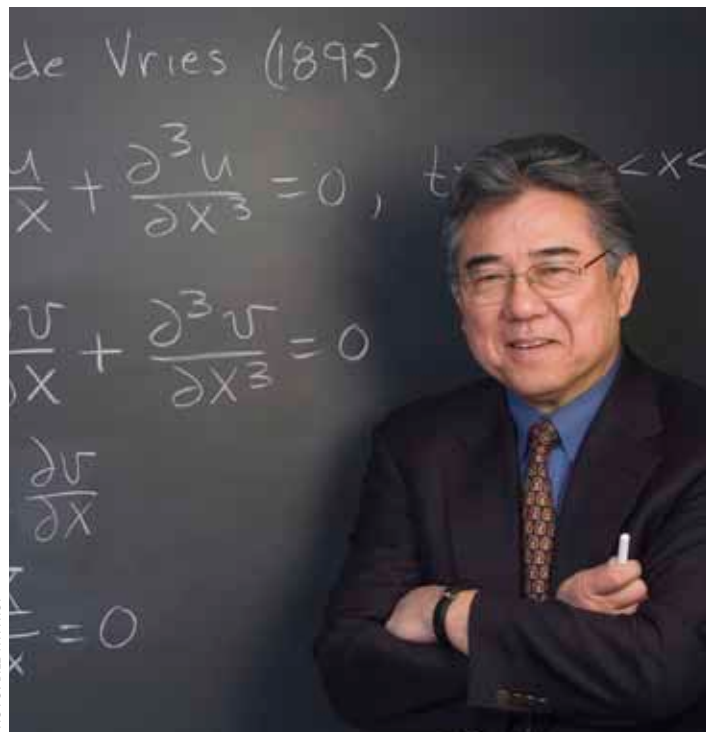


PHOTO: BILL WITTKOP

## PRIDE IN NJIT: Miura Among First Math Fellows

Distinguished Professor Robert M. Miura has been named a 2013 inaugural Fellow of the American Mathematical Society. The Fellows in this first cohort have made outstanding contributions to the creation, exposition, advancement, communication and utilization of mathematics.

Miura has joint appointments in the Department of Mathematical Sciences and the Department of Biomedical Engineering. His research focuses on developing mathematical models in neuroscience for cell and tissue dynamics. He helps

biologists understand how a type of depressed brain activity propagates as a slow pathological wave. This wave is associated with migraine and aura headaches, stroke and traumatic brain injury.

Earlier in his career, Miura solved the Korteweg-de Vries equation with mathematicians from the Princeton Plasma Physics Laboratory. To solve the equation, Miura helped develop the inverse scattering method for solving nonlinear partial differential equations. In 2006, he shared the prestigious Leroy P. Steele Prize for a Seminal Contribution to Research in Mathematics from the American Mathematical Society. ■

<http://math.njit.edu>

## ALUMS CREATE WINNING APPS

Three NJIT alumni have captured national attention with apps that entertain and awaken.

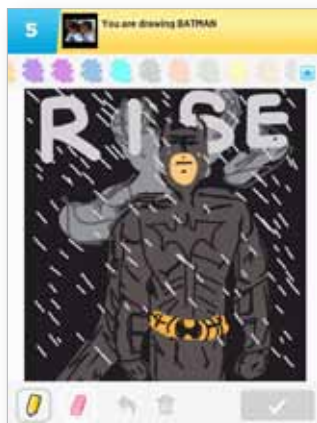


*Bomax: The Cranky Alarm* is the nationally popular Apple app created by James Formanes '01 and Jonah Olayinka '01, both mechanical engineers. During the day, the two work as engineers at Picatinny Arsenal in New Jersey. But in their free time they founded a mobile app development company called Interactive Time.

*Bomax* transforms an iPhone's alarm into a mini game that features a cranky character – one you must defeat to turn off the alarm. The app offers an array of annoying awakening noises, from a buzzing bee to a jackhammer and rooster. You can even program your own voice to wake you. And there's a choice of three games: *Whack-A-Clock*, *Dunk the Clock* and *3-Mug Monte*. *Bomax* has been reviewed favorably by tech websites and blogs such as *AppCraver* and *TopTenREVIEWS*.

Alwin Ventura '06, BS in information technology, helped to create *Draw Something*, an Apple and Android smartphone app that allows players to illustrate words and phrases for other players to guess. Soon after it was launched, the game exploded in popularity, with 50 million downloads in 50 days.

Ventura worked as a quality assurance analyst for OMGPOP, the start-up company that developed the game. And just seven weeks after *Draw Something's* launch, OMGPOP was bought by Zynga, the world's largest social game developer. After the buyout, Ventura was promoted to associate producer, working with the OMGPOP/Zynga team on franchising *Draw Something*. ■



## HONORING EXCELLENCE IN INNOVATION

Two NJIT faculty and alumni have been honored by the Research and Development Council of New Jersey and the New Jersey Inventors Hall of Fame for wide-ranging achievements.

Research Professor Reginald Farrow and Professor Gordon Thomas received a 2012 Edison Patent Award from the Research and Development Council for a medical device developed with their former doctoral student Sheng Liu '08. The award is for the NJIT SmartShunt™, patented under the title "No Clog Shunt Using a Compact Fluid Drag Path."

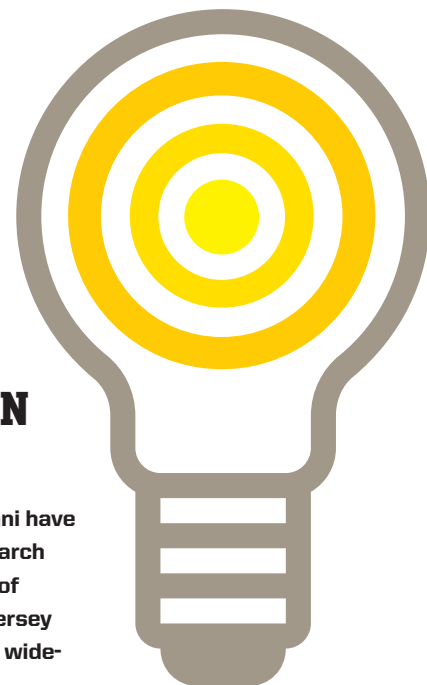
This unique device enables non-invasive wireless monitoring of the extremely slow flow of cerebrospinal fluid and of tiny changes in pressure in a shunt that drains fluid out of the brain. Shunts are commonly used by patients suffering from severe excess pressure in the brain due to hydrocephalus or brain injury.

Honorees at the 2012 Inventors Hall of Fame awards ceremony included Nirwan Ansari, professor of electrical and computer engineering. He received the Inventor of the Year Award for patented technology related to broadband networks, multimedia and communications technologies.

Distinguished Research Professor of Physics Louis J. Lanzerotti and Ricky John '81 were honored with Innovators Awards. Lanzerotti was recognized for his research involving the impact of solar-terrestrial processes on technologies and John was cited for his work in energy conservation and management by automation.

Jie Yang '04, who completed a PhD in electrical engineering at NJIT, received a Graduate Student Award for researching detection technology that addresses the problem of distinguishing between a driver and a passenger using a mobile phone.

Harry Roman '70, '74, retired PSE&G engineer and president emeritus of the New Jersey Inventors Hall of Fame, received the Outstanding Contributions Award for his "untiring dedication, contributions, service, leadership and guidance of the organization." ■



*“The interaction between proteins and the cellular membrane is crucial to proper cellular function and signaling.”*

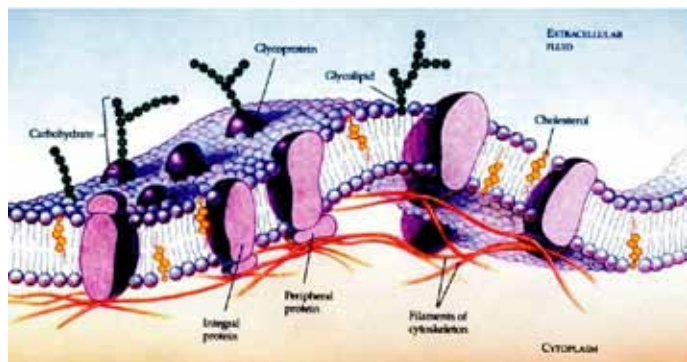
— Associate Professor Yuan-Nan Young,  
Department of Mathematical Sciences

## SKIN DEEP STUDY

Associate Professor Yuan-Nan Young, Department of Mathematical Sciences, has a three-year, \$212,000 National Science Foundation grant to mathematically model how surfactants interact with the skin’s lipid bilayer. A surfactant, also known as a wetting or surface-acting agent, breaks the surface tension of a liquid to create more contact with another substance.

“The interaction between proteins and the cellular membrane is crucial to proper cellular function and signaling,” says Young. “Researchers are trying to understand the fundamental biophysics underlying such interaction for drug delivery to cure disease. The more we know about this complicated interaction between proteins and cellular membranes, the better we can control such interaction to improve our medicinal technology.” ■

<http://math.njit.edu>



## A NATIONAL LEADER

IN HEALTH INFORMATION TECHNOLOGY

The New Jersey Health Information Technology Extension Center (NJ-HITEC) at NJIT is a national leader in the U.S. among the 62 Regional Extension Centers assisting primary care providers (PCPs) with implementing and effectively using electronic health record (EHR) technology. NJ-HITEC

met the first of two milestones per its federal grant requirement with over 6,600 PCP members, surpassing the 5,000 stipulated by the grant.

In December 2012, it reached the second milestone with over 5,100 PCPs actively using an EHR system. NJ-HITEC is also well on its way to meeting a third milestone with 47 percent of its members achieving the federal requirement of “meaningful use.” To date, New Jersey providers have received over \$42 million in federal incentive payments from

## END NOTES

**Ali Akansu**, professor in the Department of Electrical and Computer Engineering, was the lead guest editor of the special issue of the *IEEE Journal of Selected Topics in Signal Processing* on signal processing methods in finance and electronic trading.

**Nirwan Ansari**, professor in the Department of Electrical and Computer Engineering, delivered a keynote speech, “Content Delivery Acceleration,” at the Third International Conference on Ambient Systems, Networks and Technologies in Ontario, Canada.

**Maurie J. Cohen**, associate professor in the Department of Chemistry and Environmental Science and the Department of Humanities, has been named to a task force on green development and sustainable consumption in China. The task force is an initiative of the China Council for International Cooperation on Environment and Development (CCICED). Established in 1992 with the approval of the Chinese government and funded by several national governments, CCICED is an advisory body of senior Chinese and international officials with a mandate to research environmental and developmental issues and make policy recommendations.

**Christopher Funkhouser**, associate professor in the Department of Humanities and director of the undergraduate program in professional and technical communication, has joined the Literary Advisory Board of the Electronic Literature Organization (ELO). The ELO was founded in 1999 to promote the reading, writing, teaching, and understanding of literature as it develops and persists in a changing digital environment.

**Michael Jaffe**, research professor in the Department of Biomedical Engineering, has been honored with membership in the 2012 class of Fellows of the American Chemical Society. Jaffe’s research in conjunction with the Iowa Corn Promotion Board has led to a patented corn-derived substitute for bisphenol A (BPA) suitable for use in a wide range of consumer products.

An article in the journal *Science* by **Marino Xanthos**, professor in the Otto H. York Department of Chemical, Biological and Pharmaceutical Engineering, reviewed the recycling of polypropylene, a plastic used in numerous consumer products. The article covered collection and separation efficiency, processing chemistry, and market dynamics for the products derived from recyclates.



the Centers for Medicare and Medicaid Services with assistance from NJ-HITEC.

NJ-HITEC helps New Jersey PCPs select, implement and use an EHR system certified by the Office of the National Coordinator for Health Information Technology. The NJIT organization was established in June 2010

with a \$23 million grant from the U.S. Department of Health and Human Services, Office of the National Coordinator as part of the American Reinvestment and Recovery Act of 2009. As one of the nation’s federally-designated Regional Extension Centers, NJ-HITEC is working to apply leading-edge health information technology to improving healthcare delivery and patient care. ■

[www.njhitec.org](http://www.njhitec.org)