

# ABSTRACTS

## BUILDING NJIT'S FUTURE

NJIT will receive \$20 million in capital funding from the State of New Jersey to renovate classrooms and laboratory spaces. Chief among the building projects will be the creation of Makerspace, a 9,500-square-foot-facility that will heed the call for innovation, invention and production in today's burgeoning STEM economy.

The \$20 million award stems from bond referendums in which voters approved funding for capital projects at colleges and universities in the state. It follows a highly competitive application process and is one of the largest awards given by the state during the referendum's second round of funding in the fall of 2015. NJIT received funds from both the Building

Our Future Bond Act as well as the Higher Education Capital Improvement Fund.

"Campus transformation serves to enhance the student experience and solidify NJIT's position going forward as one of the nation's leading research and public polytechnic universities," said President Joel S. Bloom. "The state bond award augments the ongoing transformation of our campus as a catalyst for the development of the highly needed STEM workforce and the science and technology-driven economic development for Newark, the state and nation."

Housed in the Advanced Manufacturing Laboratory of the Guttenberg Information Technologies Center, Makerspace will



offer students, faculty, regional companies and manufacturers opportunities for multidisciplinary collaboration in everything from 3-D printing, general fabrication, computer-network-control and general machining to industrial meteorology, wood and metal-work, advanced manufacturing and electronics assembly.

The first round of the \$750 million Building Our Future Bond Act was distributed in 2013. NJIT received nearly \$100 million, which the university has used toward renovating the Central King Building and constructing a new Life Sciences and Engineering Building. ■

## PIONEERING RESEARCH



NJIT has received a \$1 million grant from the W.M. Keck Foundation for a three-year project titled "Engineering New Materials Based on Topological Phonon Edge Modes." This project—the first major collaboration between NJIT and Yeshiva University—will seek to elucidate the fundamental dynamics of cell division and other functions of living cells, and lay the groundwork for the fabrication of a new class of metamaterials with novel physical properties and functionalities.

"We are thrilled to have received this prestigious grant from the

Keck Foundation," said President Joel S. Bloom. "It will support transformational research by our world-class faculty, who are pushing the edge of the envelope in biophysics, nanotechnology and materials science." Added Provost and Senior Executive Vice President Fadi Deek: "This exciting grant from the Keck Foundation will help advance NJIT's far-reaching goals to promote groundbreaking multidisciplinary research as part of *2020 Vision*, the university's strategic plan. The Keck grant is an important milestone in our efforts to elevate NJIT to a top-tier research institution."

Co-PIs Camelia Prodan, associate professor of physics at NJIT, and Emil Prodan, professor of physics at Yeshiva University, have already published a seminal paper demonstrating the role of the unique vibrations known as topological phonon edge modes in the functioning of microtubules—essential skeletal material in eukaryotic cells.

This project will adapt recent NJIT research breakthroughs in nanotechnology to provide the first experimental verification of the key role that these topological phonons play in many fundamental cellular processes, including cell division and movement. In addition to developing new microfluidic devices to stabilize microtubules and drive acoustic modes, the research team will seek to predict and fabricate topological phononic crystals, which have a wide array of applications, including energy-efficient solar cells, sound deadening and amplification, and insulation. The grant will also provide funding to support two NJIT graduate students studying physics. ■

## VISIONARY LEADERSHIP

The New Jersey Council of County Vocational-Technical Schools (NJCCVTS) presented its 2016 Career and Technical Education Leadership Award to President Joel S. Bloom. As a visionary partner of the state's county vocational-technical schools, Bloom has helped to transform technical education in New Jersey.

"Throughout his long career at NJIT, Joel Bloom has been committed to expanding technical education opportunities for all types of students," said Timothy McCorkell, president of NJCCVTS and the superintendent of the Monmouth County Vocational School District.

In accepting the award, Bloom spoke about his early efforts to partner with county vocational-technical school career academies to provide talented students with a pathway to NJIT's Albert Dorman Honors

College. Today, the largest number of students in the Honors College are from county vocational-technical school career academies.

"The broadest retention of learning is by doing," said Bloom. "That is what goes on today in county vocational-technical schools."

NJIT has numerous articulation agreements with county vocational-technical schools that enable students to earn college credit for their advanced learning and get a head start on a technical degree at the state's flagship technology



President Joel Bloom accepts the New Jersey Council of County Vocational-Technical Schools 2016 Career and Technical Education Leadership Award from NJCCVTS President Timothy McCorkell and NJCCVTS Executive Director Judy Savage.

PHOTO: N.J. COUNCIL OF COUNTY VOCATIONAL-TECHNICAL SCHOOLS

university.

"Articulation agreements between our county vocational-technical schools and NJIT are a win-win for students and parents, and for the university," said NJCCVTS Executive Director Judy Savage. "They are also

a big win for New Jersey because they keep more top STEM students in state, where they are more likely to move into high-demand positions in engineering, computer science and other fields." ■

## ADVANCING KNOWLEDGE OF COASTAL COMMUNITIES

A two-year grant from the New Jersey Sea Grant Consortium—an affiliation of colleges, universities and other groups dedicated to advancing knowledge and stewardship of New Jersey's marine and coastal environment—will help NJIT's Center for Resilient Design (part of the College of Architecture and Design) develop techniques to protect ecosystems and their surrounding communities from flooding.

The project, "At Risk: Healthy Coastal Ecosystems and Resilient Communities & Economies in an Era of Climate Change: A Balanced Approach to Protecting People, Property and Nature in Historic Greenwich Township, New Jersey" is spearheaded by Colette Santasieri, director of policy and planning innovation for civil infrastructure and environment at NJIT, and conducted in

collaboration with Rutgers and Montclair State Universities.

"Primarily, this project serves to research and analyze potential solutions to Greenwich Township's efforts toward resilience," said Santasieri. "But it also will prove critical to the ecosystem health and economies of all coastal communities in New Jersey, especially with regard to the farming, fishing and recreation industries."

Greenwich Township, located on the banks of the Cohansy River in Cumberland County, was one of the many Delaware Bayshore-area towns flooded four years ago by the storm surge from Hurricane Sandy. Also greatly affected was the village's ecosystem, which plays a vital role in both the local environment and economy.

The results of the case study, which will determine the

likelihood and magnitude of environmental effects based on natural-resource vulnerabilities and identifying a range of protective flood-mitigation alternatives, will be used as a process-solution model and online

education program by other coastal communities threatened by rising waters from storms. Deane Evans, executive director of NJIT's Center for Building Knowledge, will lead the effort. ■



# Perkins Eastman



## DESIGNING WOMAN

In her first year at the New York headquarters of architecture and planning firm Perkins Eastman, Sabrina Raia '15 signed onto an eye-opening, high-wattage project on the Upper East Side of Manhattan: a 25-story cancer center for Memorial Sloan Kettering that will house research, clinical trials and new models for outpatient care—all under one roof.

Raia, who earned both an undergraduate degree in architecture and a master's in civil engineering at NJIT, dove right into the nitty gritty of construction administration, helping coordinate utility infrastructure drawings. She will be on-site as the center goes up, making sure the work is done according to specifications.

But eager to keep her hand in design, she leapt at the chance to

enter an in-house competition at Perkins Eastman that took her a world away from the technical complexities of building a 21st-century high-rise. This year's focus was a career training and development center slated for Bihar, India, an impoverished state bordering Nepal, for women on the margins of society — victims of domestic violence, women and girls forced into prostitution and members of the so-called “untouchable” caste, all at continuing risk of human trafficking.

Open to young architects below associate level in the firm's offices across the globe, Raia teamed up with Snigdha Agarwala, a 26-year-old colleague in New York, to create a light-filled, airy, environmentally sustainable complex centered around large, open-air courtyards with trees and plants on site. Porous, red-brick walls run through the interior with openings

of various sizes to create a sense of fluidity and connection, while



providing ready-made niches for the women to display their handiwork. To her complete surprise, they won.

The pair's sustainable design features permeable pavers that will allow rainfall to collect in below-ground containers for reuse in the building, and solar panels on roofs pitched to the south to maximize the amount of sunlight harvested.

“Sabrina and Snigdha's design is very doable, very constructible. I loved the planning, the hierarchy of scheme, with its configuration of office spaces, production areas and residences, and the possibility of extensions,” said Christine Schlenndorf, a principal at the firm who organized and oversaw the competition. “Its nice overall layout caught the eye.”

“It was a humbling moment since this project will help so many women,” commented Raia, “and I get to be a part of it.” ■

## FINANCE FUNDAMENTALS



PHOTO: MICHAEL SWEENEY

Hugh '69 and Marion Conway '70, '73 with Financial Literacy Program students Seti Vega and Coralie Jean-Francois.

Thirty-four students from 75 neighboring urban high schools were introduced to the fundamentals of finance in a four-week Financial Literacy Program offered by NJIT's Martin Tuchman School of Management. The free summer financial literacy camp—now in its 20th year and supported by Hugh '69 and Marion Conway '70, '73, as well as the TD Charitable Foundation and the Leir Charitable Foundation—offers classes, lectures, computer labs, fun outings and a field trip to Wall Street. Participants in the camp study financial management, investment and economics while acquiring public speaking, presentation and teamwork skills from group projects—and develop motivation for academic and professional success.

“Over the course of the camp the students learn how to research and assess financial information and make sound decisions based on that research,” said Michael Ehrlich, a professor of finance who is the principal of the Financial Literacy Program. “But most importantly, the camp gives them confidence, brings them onto a college campus and lets them view themselves as future college students.”

The Conways said they fund the camp because they believe in its purpose: to give urban high school students a step up and put them on the track to success and college. And as alumni, they also believe in NJIT. They met while they were students 50 years ago and have been married for 46 years. Their son also has three degrees from the university, so together the family has six NJIT degrees. They both said they had great careers — Marion still works as a consultant to nonprofit companies — and are thus happy to support an effective program run by their alma mater. “We’ve supported the financial literacy camp for nine years,” said Marion, “because we believe in the community.” ■

## END NOTES

**MATTHEW P. ADAMS**, assistant professor in the John A. Reif, Jr. Department of Civil and Environmental Engineering, presented two papers at the 15th International Conference on Alkali Aggregate Reaction in Concrete (ICAAR) in Sao Paulo, Brazil July 3-7, 2016. ICAAR is the pre-eminent conference on advances in understanding alkali-aggregate reaction in concrete systems.

**CESAR BANDERA**, assistant professor of entrepreneurship in NJIT's Martin Tuchman School of Management, was named South American Director of the Academy of the International Council for Small Business (ICSB) for 2017. An intensive weeklong boot camp for international university entrepreneurship students, the Academy, now in its second year, is held in conjunction with the World Conference of the ICSB.

**YI CHEN**, Henry J. Leir Chair in Healthcare and an associate professor in NJIT's Martin Tuchman School of Management, was invited to give a talk June 22 at the

University of Maryland's Robert H. Smith School of Business about her research on mining health forums for adverse drug reaction (ADR) discovery. Dr. Chen presented the advanced technologies that her group has developed to mine the fast-growing user-contributed content in health forums in order to automatically discover ADRs for post-marketing surveillance and for evidence-based decision-making.

**EDGARDO FARINAS**, associate professor and chair of the department of chemistry and environmental science, received a Salute to Excellence Award from the North Jersey Section of the American Chemical Society for his leadership in helping to make the New Jersey Chemistry Olympics a success for all participants.

**JERRY FJERMESTAD**, a professor in NJIT's Martin Tuchman School of Management, presented his paper “Collective Intelligence: There Is More to the Story” at the 2016 Collective Intelligence Conference June 1-3 at New York University's Stern School of Business.

**SHANTHI GOPALAKRISHNAN**, a professor in NJIT's Martin Tuchman School of Management, was invited to Universidad Pablo de Olavide, Seville, Spain, to present her research on “Environmental Jolts and Strategic Alliances in the Aftermath of the 9/11 Terrorist Attacks.”

**THERESA HUNT**, senior lecturer in the department of humanities, published an article entitled “A Network of One's Own: Young Women and the Creation of Youth-Only Feminist Spaces” in the prominent international youth studies journal *Young*. The article details the results of her three-year study tracing the social media communities of young women's rights activists from the Middle East, Scandinavia and Eastern Europe.

**LOUIS LANZEROTTI**, distinguished research professor in the department of physics, received the William Kaula Award from the American Geophysical Union in recognition of his “unselfish service to the scientific community through

extraordinary dedication to, and exceptional efforts on behalf of, the Union's publications program.”

**KARL W. SCHWEIZER**, professor, Federated Department of History, was awarded the Adelle Mellen Prize for distinguished scholarship for his book *Oligarchy, Dissent and the Culture of Print in Georgian Britain*.

**JIM SHI**, assistant professor of supply chain management and finance in NJIT's Martin Tuchman School of Management, published an article titled “Cash-Flow Based Dynamic Inventory Management in *Production and Operations Management* with his co-authors Dr. Michael Katehakis and Dr. Benjamin Melamed, both distinguished professors at Rutgers Business School. The article tackles the issue of optimal cash flow management via studying the interplay between financial decisions and operational decisions.