

NEW LIFE SCIENCES AND ENGINEERING CENTER OPENS

An array of innovation-focused New Jerseyans – scientists, student researchers, alumni, company executives and elected officials – gathered on campus last September to hail the much-anticipated opening of NJIT’s new Life Sciences and Engineering Center, a \$21 million state-of-the-art research facility focused on the future of health care.

“This is an exciting time in biomedical engineering,” noted Treena Arinzeh, director of NJIT’s Tissue Engineering and Applied Biomaterials Laboratory, in pointing to the recent plethora of game-changing health technologies such as gene editing, cell therapy, nanoparticle technology and regenerative medicine. “But all of these approaches require multidisciplinary teams, coming together from disparate fields.”

The new center promises to provide those crucial opportunities. The four-story facility, which houses more than 20,000 square feet of shared laboratories and meeting spaces, IT infrastructure and cutting-edge scientific instrumentation, is

designed to promote collaboration in fields ranging from biomedical engineering and the biological sciences to electrical engineering and healthcare technologies.

Its mission is to build on NJIT’s increasingly transdisciplinary strengths in engineering and the life sciences – with a particular focus on biotechnology, biosensors and medical devices and nanotechnology – toward the development of new applications in clinical healthcare, therapeutic interventions and pharmaceutical drug development. By linking the experimental side of research with powerful computation, NJIT and its partners will feed data generated in the university’s laboratories into computer models and simulations that will, for example, be able to forecast molecular, cellular and tissue behavior for clinical applications.

The new structure connects to the Otto H. York Center for Environmental Engineering and Science to form a



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cohesive complex that leaves room for a 47,000-square-foot expansion in the future. Additionally, a two-story atrium and presentation space provides opportunities for informal learning, gathering and teaching. The new facility is part of an ongoing capital building and renovation program that is transforming research, teaching and campus life at NJIT. ■



At the LWD press conference, (from left) Aaron Fichtner, LWD commissioner; Gale Spak, associate vice president of continuing professional education at NJIT; and Joel S. Bloom, president of NJIT.

A Focus on Talent

A very special announcement delivered Oct. 30 in NJIT’s Eberhardt Hall drew members of the university community

as well as guests from the New Jersey Department of Labor and Workforce Development (LWD). There, LWD Commissioner Aaron Fichtner officially disclosed the seven higher education recipients of \$8.4 million in state grants to oversee New Jersey’s Talent Development Centers (TDC), designed to create innovative career pathways and apprenticeships in the Garden State’s key industries.

NJIT has been named host of the

TDC for construction and utilities. “This center is a very fast-growing industry,” commented NJIT President Joel S. Bloom. “It represents about nine percent of the economy of the State of New Jersey, and we know there is a wide range of jobs.”

Each institution will be awarded \$1.2 million to provide credential-focused education and training in its respective industry to dislocated, disadvantaged and currently employed workers. Toward this end, each also will be tasked with developing employer-driven partnerships that involve businesses, high schools, colleges, universities, labor unions and workforce development. ■



From left: John W. Seazholtz '59, chair of the NJIT Board of Overseers; Tara Alvarez, Professor of Biomedical Engineering at NJIT; and NJIT President Joel S. Bloom

RECOGNIZING RESEARCH EXCELLENCE

Tara Alvarez, a professor of biomedical engineering who studies the links between visual disorders and the brain and develops novel devices to identify and treat them, was awarded NJIT's Excellence in Research Prize and Medal from the Board of Overseers at a ceremony on campus last October.

Yehoshua Perl, a computer science professor who brings order and accuracy to massive databases of medical

information, received the board's Excellence in Research Lifetime Achievement Award.

With a multidisciplinary team of engineers, computer scientists, artists and clinicians, Alvarez is currently developing instruments to detect and treat the eye motor disorder known as convergence insufficiency, in which the muscles that control eye movements do not coordinate to focus on near objects. Because each eye sees images separately, the person experiences double and blurred vision, headaches and difficulty concentrating. The impact on cognition and learning can be severe, particularly in children.

The disorder also is one of the primary symptoms of concussion, and Alvarez is working with five major children's hospitals around the country to test her devices, which are potentially powerful diagnostic

tools. She hopes that one day they will help coaches and trainers on the field, for example, decide if it is safe to return a shaken-up player to the game.

As Alvarez explains, "The visual neural circuit composes a lot of space in the brain, and is thus easily damaged by a concussion. In terms of cognitive load, if someone is expending significantly more energy acquiring visual information, then less energy is available for thinking."

Reflecting on her career, she said, "If you really work hard and have a passion for what you love, you can make your dreams come true. And not because I say so, because I'm doing it."

Perl was unable to attend the ceremony, and so it was up to his longtime co-workers and friends to speak for him. And they did, elegantly, calling him a towering figure in the field of biomedical ontology – a branch of medical informatics that enables the acquisition, storage and retrieval of information – as well as a cherished mentor and friend.

John W. Seazholtz '59, chair of the Board of Overseers, lauded the NJIT researchers for their drive to "improve quality of life" and "benefit individuals in profound ways." ■

TRIO HONORED FOR GROUNDBREAKING WORK ON SPINAL INJURIES

A trio of NJIT-affiliated biomedical engineers was honored for groundbreaking work on nerve growth and repair at the 38th Edison Patent Awards Ceremony held at the Liberty Science Center in Jersey City.

The team, composed of Treena Arinzeh (right), a professor of biomedical engineering, George Collins, an adjunct professor, and alumna Yee-Shuan Lee, Ph.D. '10, now a researcher at the Miami Project to Cure Paralysis, a Center of Excellence at the University of Miami Miller School of Medicine, were winners in the biomedical category.

Their patent describes a novel strategy for combining a piezoelectric scaffold with neural cells to regenerate nerve tissue in spinal cord injuries. Piezoelectricity is an electrical charge created by mechanical

force that is also used in sonar and sound technologies, among others.

The Research & Development Council of New Jersey, which confers the patent awards, described their invention as "highly innovative by combining smart biomaterials with tissue engineering

approaches utilizing neural cells."

The technology does not rely on an external energy source or electrodes for electric stimulation, and can be fabricated into a fibrous form to provide additional contact guidance for cell attachment and axonal growth. The scaffold supports neural cell growth and attachment, which can promote axon regrowth and achieve integration with the host synaptic pathways. ■



NJIT and IBM Launch New Flagship Alliance

On an ordinary fall morning, something extraordinary transpired inside NJIT's Campus Center Atrium. There, NJIT administrators, faculty, staff and students joined executives from IBM to launch the new flagship alliance between the university's Martin Tuchman School of Management (MTSM) and IBM Global University Programs. The partnership, made official on Oct. 19, marks a unique collaboration between the two entities to deliver digital technologies and education to NJIT students through MTSM and its Business Analytics Lab. NJIT is the first university in the United States – and the only university in North America – to adopt the IBM Skills Academy, a key component of IBM Global University Programs.



From left: Martin Tuchman '62, chief executive officer of the Tuchman Group; Joel S. Bloom, president of NJIT; Naguib Attia, vice president, IBM Global University Programs; David McQueeney, vice president, Corporate Technology, IBM Corporation; and Reggie Caudill, dean of Martin Tuchman School of Management.

The initiative is based on the workforce needs of today's "Business with the Power of STEM" digital economy. Courses are being offered to NJIT students in three career tracks: business intelligence analyst, business process analyst and predictive analyst modeler. Additionally, students will have access to boot camps and workshops. The technologies will be delivered to NJIT via the IBM Cloud.

"Being the first university to implement the IBM Skills Academy Program aligns with NJIT's history of engagement with industry, which has resulted in dramatic impacts on economic development and has helped prepare our graduates for uncommon career success," said NJIT President Joel S. Bloom to the day's attendees. "This new partnership between NJIT's Martin Tuchman School of Management and IBM is the latest opportunity we are seizing upon to

provide our students with a workplace advantage by collaborating with industry."

"IBM is committed to doing our part to expand educational opportunities so more students and professionals can learn the in-demand new collar skills that will help them thrive in today's marketplace," noted Naguib Attia, Ph.D., vice president, IBM Global University Programs. "After seeing this program's success in Africa, we're excited to be working with NJIT to bring the program to the United States for the first time."

Participating students will be able to earn industry-recognized digital badges and IBM technology certifications for IBM tools, as well as the academic credits that accompany their classes. This certification and microcredentialing will provide a significant competitive edge and differentiate students during their job searches. ■

STELLAR ACHIEVEMENT

Louis Lanzerotti, a distinguished research professor of physics best known for shedding light on the space environment around Earth and its impact on hardware in space and critical infrastructure on the ground, received the 2017 Arthur M. Bueche Award from the National Academy of Engineering for his "extraordinary impact on the engineering profession."

Named in memory of Bueche – the top

technical officer for General Electric Co., an advocate for science and technology adept at applying research to benefit society, and an adviser to universities, presidents and international organizations – the annual award recognizes pivotal contributions not only in the arena of science and technology, but in public policy as well.

In the mid-1960s, just as U.S. space

exploration was taking off, Lanzerotti began tackling some of the fundamental challenges of flying spacecraft in orbit around Earth. With a newly minted Ph.D. in physics from Harvard University, he joined AT&T Bell Labs to study Earth's radiation belts just as the AT&T Telstar satellites were launched.

"As issues arose around the effects of radiation on space hardware, Lanzerotti participated in the building, testing, and calibration of radiation instruments for first-generation geosynchronous telecommunications satellites. His work helped develop robust space-based communications and science systems, and contributed to many NASA space missions that have allowed us to expand our knowledge of the universe," the academy noted in a release. ■



Louis Lanzerotti, distinguished research professor of physics, received the 2017 Arthur M. Bueche Award from the National Academy of Engineering. From left: Dr. Andrei Z. Broder, NAE Awards Committee Chair; Dr. C. D. Mote, Jr., NAE President; Dr. Lanzerotti; and Gordon R. England, NAE Council Chair.