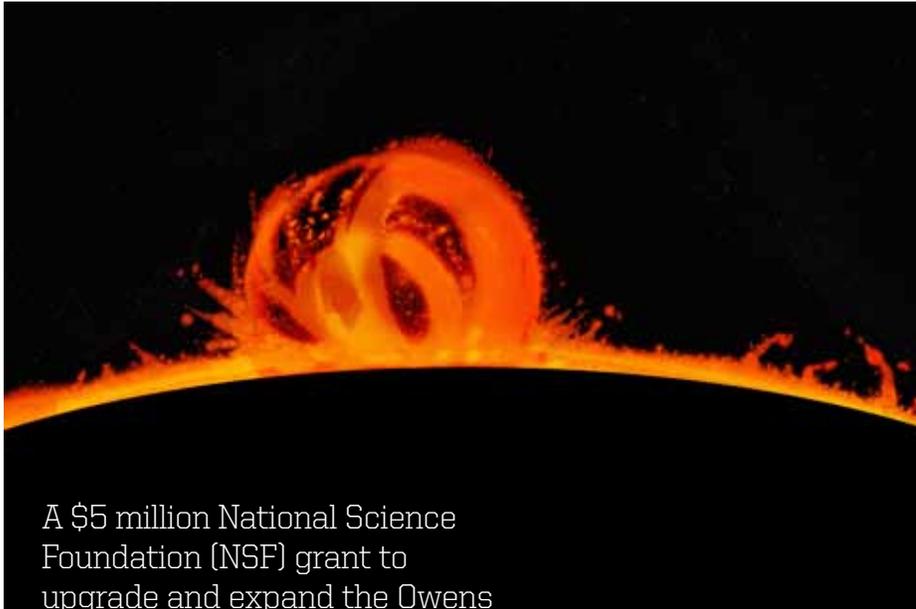


ABSTRACTS

Space weather incidents such as solar flares can cause problems with cell phone reception, GPS systems, power grids and other technologies.

TUNING IN ON THE SUN



A \$5 million National Science Foundation (NSF) grant to upgrade and expand the Owens Valley Solar Array (OVSA) in California has been awarded to NJIT under the American Recovery and Reinvestment Act of 2009. Operated by NJIT since 1997, the OVSA is the only radio observatory in the U.S. dedicated to solar research.



“Space weather incidents such as solar coronal mass ejections and solar flares can cause problems with cell phone reception, GPS systems, power grids and other technologies,” says Dale Gary, distinguished professor of physics and OSVA director. “We hope that by improving radio frequency observations of the Sun we can learn much more about the nature of these phenomena and how to minimize their terrestrial impact.”

The three-year grant will increase the number of receiving dishes from 7 to 15 and allow for other improvements to equipment at the site. It’s very significant that the refurbished array will enable researchers to study the Sun over 17,000 frequencies, as opposed to the 86 frequencies previously available.

According to Gary, the availability of so many frequencies will facilitate observing the Sun at much narrower frequencies, which is basic to obtaining more detailed information about the phenomena under investigation. Observing at narrower frequencies also makes it easier to compensate for interference from terrestrial sources, such as wireless communications systems. ■

ovsa.njit.edu

FOOD FOR THOUGHT

The international food production and processing industry is the focus of a new NJIT bachelor’s program in multinational engineering management. NJIT will offer the degree in partnership with a consortium of universities from the United States and the European Union (EU). Support includes a \$416,000 grant from the U.S. Department

of Education’s Fund for Improvement of Post Secondary Education and an equal grant from the EU.

Layek Abdel-Malek, NJIT professor of industrial engineering and program director, expects to enroll a first class of 12 students at participating U.S. and European campuses in September. NJIT is the lead American institution, while the University of Parma, Italy, leads the European effort. Rutgers University, New Brunswick, and the University

of Extremadura in Spain are also partners.

The program will emphasize industrial engineering, supply chain management and operations management, along with intensive language training and cultural exposure. U.S. students will spend 12 months of the four-year program in Italy and Spain, while European students will spend a year at NJIT or Rutgers. ■

mechanical.njit.edu



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HONORING INNOVATION

NJIT faculty and alumni were among the innovators honored at the 22nd Annual New Jersey Inventors Hall of Fame Awards ceremony in October. Timothy Chang, distinguished professor of electrical and computer engineering, received a Special Award for achievements ranging from personalized weapon technology to molecular biology and decentralized control systems. Yun Q. Shi, professor of electrical and computer engineering, was recognized for his work in digital forensics and security.

Chang has been a leader in the program to develop handguns



PHOTO: ZHENG FANG CHEN, PHD '98
Professors Yun Q. Shi and Timothy Chang

that can electronically recognize authorized users and record all firing activities, funded by the National Institute for Justice, the State Department and the Army. Chang's work in biomedical applications includes his patented Smart Pin liquid-dispensing system for molecular research. His investigation of decentralized control has significant implications for managing urban traffic networks, large power grids and data routing on the Internet.

Richard Caizza, who earned a certificate in plastics technology from NJIT in 1992, received the Inventor of the Year award for his patent "Single-Handedly Actuable Safety Shield for Needles." This innovation improves the safety of needles used to create a permanent means of entry into a vein or artery so that drugs may be administered without repeatedly puncturing the skin.

Vikki Hazelwood, MS '98, biomedical engineering professor at Stevens Institute of Technology, received the Advancement of Invention award, given for a "sterling record of sustained encouragement of innovation in New Jersey" serving as a "model to encourage careers linked with or dependent upon invention and innovation."

Shi was also among 30 New Jersey inventors from eight companies and universities honored in November at the 2010 Thomas Alva Edison Patent Awards ceremony, sponsored by the Research and Development Council of New Jersey. Shi was recognized for his invention of a new method to detect tampering with electronic images. Known as steganography, Shi's innovation allows original digital cover images to be recovered without distortion once hidden data has been extracted. This technology, which has received four patents, has promising applications in digital forensics, intellectual property security and the transmission of medical images. Other NJIT researchers working on this project were Zhicheng Ni, PhD '05 and Professor Nirwan Ansari. ■ ece.njit.edu

The breathalyzer system can detect several hundred different chemical compounds in samples of human breath.



BREATH TEST DETECTS RADIATION

Menssana Research Inc., whose laboratory is in the NJIT Enterprise Development Center, has a \$4.2 million contract from the Biomedical Advanced Research and Development Authority of the U.S. Department of Health and Human Services to apply its unique breathalyzer technology to testing for radiation exposure. If the contract is exercised with options, it could total over \$22 million.

The breathalyzer system that the company has developed, which is much more sensitive than those used to measure blood alcohol concentrations, can detect several hundred different chemical compounds in samples of human breath. It is currently in studies to identify disease biomarkers for lung cancer, breast cancer and tuberculosis. A pilot study has already identified biomarkers indicating radiation exposure in cancer patients receiving radiation therapy.

Safe, non-invasive and painless, the Menssana system requires only that a person breathe gently into a mouthpiece for two minutes. The project's long-term goal is to develop a point-of-care breathalyzer that could be used to rapidly screen large numbers of people for radiation exposure, and to determine the severity of the dose received. ■ www.njit-edc.org

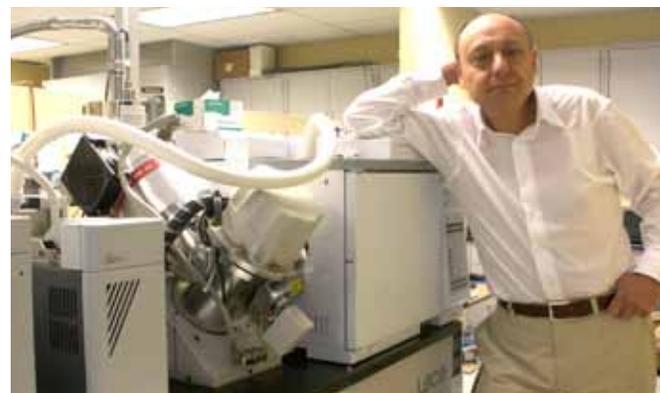


PHOTO: ASTRID PHILLIPS
Menssana founder and CEO Michael Phillips, MD



HEALTH INNOVATORS GAIN FEDERAL SUPPORT

Edge Therapeutics, Healthy Functions, HiLin Life Products, Urovalve and Samos Pharmaceuticals – what do these high-tech New Jersey companies have in common? They’ve achieved success in the health care field with the assistance of NJIT’s Enterprise Development Center (EDC) and are the recipients of more than a million dollars in funding awarded in 2009 and 2010 under the federal program “Qualifying Therapeutic Discovery Project Grants for the State of New Jersey.”

The Internal Revenue Service (IRS), in conjunction with the Department of Health and Human Services, approved applications from companies having no more than 250 employees for projects that showed significant potential to produce new and cost-saving therapies, support jobs and increase U.S. competitiveness. The IRS determined the amount to be awarded to each company.

Edge Therapeutics, Inc. transforms well-established off-patent drugs into targeted, locally delivered therapies that address medical conditions in the central nervous system.

“The EDC provided the mentoring that enabled these life-science companies to participate in this federal program.”

Judith Sheft, Associate VP for Technology Development

Healthy Functions, LLC develops state-of-the-art support surfaces to help prevent and treat pressure ulcers.

HiLin Life Products, Inc. offers products and services that improve women’s reproductive health.

Urovalve Inc.’s mission is to design, develop and commercialize superior medical devices that address serious problems with urinary flow and control.

Each of these companies is currently based at the EDC.

Samos Pharmaceuticals, LLC, an EDC graduate now headquartered in Kendall Park, New Jersey, has developed a platform technology that allows for the oral or parenteral delivery of drugs over a several-day period, such as 7 days or 30 days, with the administration of a single pill or capsule.

“The EDC provided the mentoring that enabled these life-science companies to participate in this federal program,” says Judith Sheft, associate vice president for technology development at NJIT. “We made the companies aware of the opportunity, arranged for a seminar featuring tax accounting experts and helped the firms prepare their applications. The outcome encouraged us all.”

The EDC is New Jersey’s largest high-technology business incubator, and one of the largest in the nation. The over 90 companies presently housed at the EDC employ some 300 people. They have attracted more than \$55 million in third-party funding and have had revenues of approximately \$40 million. ■ www.njit-edc.org

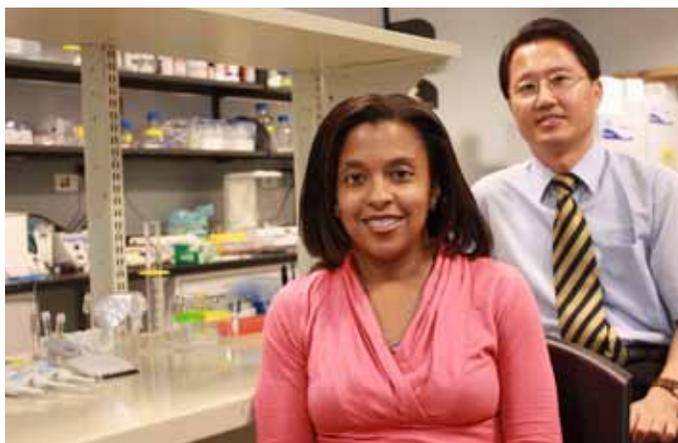


PHOTO: JOHN MICALE

RESEARCHERS RECEIVE COULTER AWARDS

Associate Professor Treena Arinze and Assistant Professor Cheul Cho, both in the Department of Biomedical Engineering, have received prestigious Coulter Foundation Translational Awards for promising patent applications. The Coulter program provides funding for professors in established U.S. biomedical engineering departments, with initial funding of at least \$200,000 over a two-year period for each recipient.

NJIT Associate Professor Treena Arinze will receive funding for work that involves creating a composite material for bone repair. This material can be combined with stem cells to enhance the rate of repair. Cho’s research focuses on designing a clinically-scaled bio-artificial liver.

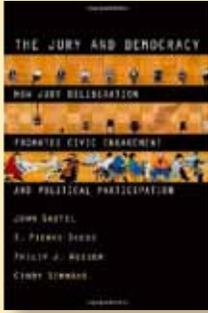
The Coulter Foundation supports biomedical research that is translational in nature. Translational research seeks to develop promising technologies with the goal of progressing toward commercial development and introduction into clinical practice. ■ biomedical.njit.edu

THE WRITE STUFF

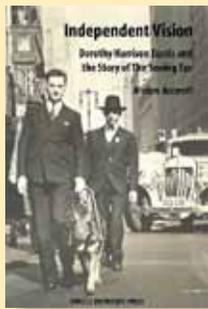
Highlander teams were once again in hot competition for prizes at NJIT Day in October – the annual fall festival of fun activities open to the entire NJIT community. This year, for the first time, competitors pulled together to write the word “Highlanders” in a rather unconventional manner. ■



BOOK SHELF



E. Pierre “Perry” Deess, director of institutional research and planning, has co-authored *The Jury and Democracy: How Jury Deliberation Promotes Civic Engagement and Political Participation* (Oxford University Press, 2010). Supported by in-depth interviews, juror surveys, and court and voting records across the United States, the authors show that jury service can trigger changes in how citizens view themselves, their peers and their government – and can even increase electoral turnout among infrequent voters. Jury service is also a factor in long-term shifts in media use, political action and community involvement.



Humanities Department lecturer **Miriam Ascarelli** has published *Independent Vision: Dorothy Harrison Eustis and the Story of the Seeing Eye* (Purdue University Press, 2010), a biography of Dorothy Harrison Eustis, founder of The Seeing Eye, the first guide-dog school in the United States and a well-known Morristown, New Jersey, institution. Drawing on correspondence, private papers and newspaper accounts, the book focuses on the arc of Eustis’s life from her upper-class childhood in Victorian Philadelphia to the confluence of events that led to the creation of The Seeing Eye in 1929 and her death in 1946. ■

PREMIER POSTER PRESENTATION

Architecture major Sophia Sobers is the first undergraduate from NJIT’s College of Architecture and Design to have a research poster accepted for SIGGRAPH, the international conference and exhibition on computer graphics and interactive design techniques held annually for more than three decades. Sobers, an Albert Dorman honors scholar, traveled to Los Angeles for her presentation on interactive parametric architecture in the



design category at the conference sponsored by the Association of Computing Machinery. ■ design.njit.edu



PHOTO: JOHN MICALE

Executive chef and NJIT Food Services director Peter Fischbach

ROOFTOP GARDEN OF PLENTY

Two years ago, NJIT planted a prototype garden on the sunny, windy roof of the Campus Center to see if anything would grow amid the solar panels. When all of the test vegetables grew well, 220 square feet of raised, irrigated planting boxes were built.

Among the garden’s most enthusiastic advocates is Peter Fischbach, award-winning chef and director of Food Services at NJIT. In the fall, Fischbach helped to bring in a harvest that he nurtured along with NJIT students, volunteers and Food Services colleague Julia Aiello. Fischbach’s Campus Center menus benefitted from fresh spinach, kale, Swiss chard, collard greens, lettuce, arugula, carrots and beets. Going forward, the plan is to plant a spring garden at the end of March, weather permitting. Hopes are high for eventual expansion into a rooftop farm of 2,000 square feet or more.

Organic gardening consultant and NJIT alumna Wanda Knapik ‘83 has helped to make the Campus Center garden a success. In 2008, Knapik launched My Local Garden (www.mylongarden.com), which is currently focused on building a broad community of backyard vegetable growers in New Jersey and creating a more sustainable local food system.

The garden will also be an outdoor classroom for NJIT’s Department of Biological Sciences. “We will be using this garden to provide inspiration and hands-on learning about biodiversity in ecological systems for our students,” says Assistant Professor Daniel Bunker.



Victor Matveev, associate professor in the Department of Mathematical Sciences, was part of a research team that recently published “N-type Ca²⁺ channels carry the largest current: Implications for nanodomains and transmitter release,” in *Nature Neuroscience*. Since transmitter release is involved in virtually every aspect of nervous system function, this research has broad significance for the understanding of normal brain processing and central and peripheral nervous system disorders.

Marino Xanthos, professor in the Otto H. York Department of Chemical, Biological and Pharmaceutical Engineering, was awarded the 2010 Heinz List Award at the annual meeting of the Society of Plastics Engineers (SPE). His colleagues honored him for outstanding achievements in polymerization reactions and polymer devolatilization.



Sponsored by LIST USA, an extrusion and polymer reaction machinery manufacturer, the award is given to an individual who has demonstrated unique vision and innovation in the field of polymer processing technology.

Xanthos, an SPE Fellow, holds five U.S. patents and has published more than 250 journal articles and conference papers over a career spanning more than 40 years. At NJIT, he has served as director of research for the Polymer Processing Institute, where he supervised researchers who developed new applications for recycled plastics based on reactive polymer processing.

Ali Akansu, professor of electrical and computer engineering and his former doctoral student Handan Agirman-Tosun, PhD, published the paper “Generalized Discrete Fourier Transform with Nonlinear Phase,” in *IEEE Transactions on*

Signal Processing, Vol. 58, No. 9. Akansu also gave a talk titled “Generalized Discrete Fourier Transform with Nonlinear Phase: A Time-Frequency Method” in October at Purdue University.

Sima Bagheri, professor of civil and environmental engineering, participated at the 8th Annual National Academies Keck Futures Initiative (NAKFI) conference, “Seeing the Future with Imaging Science,” in November. NAKFI is a 15-year effort of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine to catalyze interdisciplinary inquiry and to enhance communication among researchers, funding organizations, universities, and the general public. Bagheri’s contribution is titled “The Impact of Global Change on Nearshore Water Quality – A Remote Sensing Approach.”

Maurie J. Cohen, associate professor and director of the environmental policy studies program at NJIT, gave the keynote address on “The New Political Economy of Economic Growth” at the Pace Institute for Environmental and Regional Studies Conference on the Environment in November.

Carol S. Johnson, associate professor in the Department of Humanities, has won the 2010 National Council of Teachers of English Award in Technical and Scientific Communication in the category of Best Book in Technical or Scientific Communication for *The Language of Work: Technical Communication at Lukens Steel, 1810-1925* (Baywood Publishing Company, 2009).

Allison Perlman, assistant professor of history, has been awarded a research fellowship in the Verklin Program in Media Ethics and Policy at the University of Virginia. She is the first research fellow in the Verklin Program, which seeks to promote high-quality academic research on the ethics of media

policy, the reciprocal relationship between the media and the law, and the political and social impact of media regulation.

Stephen Pemberton, associate professor of history, presented “Hemophilia, ‘The Most Hereditary of All Diseases’: How Genetics Mattered for Experimental Hematologists Engaged in Efforts to Manage Hereditary Bleeding Disorders (1947-1964)” at the Human Heredity in the Twentieth Century Workshop held in the UK at the University of Exeter. In another presentation, Pemberton discussed the history of sickle cell disease in the 20th century and its link to race at a national symposium sponsored by the National Institutes of Health to commemorate the 100th anniversary of the discovery of this disease.

Paul G. Ranky, professor in the Department of Mechanical and Industrial Engineering, presented “Case-Based/Problem-Based Sustainable Green Engineering Teaching /Learning Methods and Experiences for Millennial Generation Engineering Students in the USA, Europe and Asia” at the 2010 International Symposium on Flexible Automation in Tokyo. He also served as co-chair of the Green Engineering Session at the conference.

Andrzej Zarzycki, assistant professor in the College of Architecture and Design, has been elected to the New York City chapter of the ACM/SIGGRAPH Board of Directors. ACM/SIGGRAPH is the Association for Computing Machinery Special Interest Group for computer graphics and interactive techniques. ■