BUFFALO Engineer

2014-2015

Student Ingenuity

Enterprising innovations from an engineering education

Onion Studio, Inc.

School of Engineering and Applied Sciences

University at Buffalo *The State University of New York*

MESSAGE FROM THE DEAN

Douglas Levere

Liesl Folks, PhD, MBA
Dean, School of Engineering and Applied Sciences

Dear friends of UB's School of Engineering and Applied Sciences,

If you haven't been following the news lately, you may have missed that our city of Buffalo is undergoing a renaissance. New businesses are emerging, old businesses are reinventing themselves and pivoting to new market opportunities, and folks are moving into downtown Buffalo to take advantage of the incredible architecture and unique civic infrastructure that Frederick Law Olmsted and other giants of urban planning and engineering bestowed us.

The sense of opportunity is pervasive, and our students, faculty and graduates are everywhere in the mix, making great things happen.

That's because engineers and computer scientists are the engine of innovation. Working alone or in groups, they bring to the community many of the economic improvements that lift people out of poverty, solve large-scale societal problems, improve the quality of life and minimize our footprint on the planet.

As we at UB train the next generation of engineers and computer scientists, we know that alongside an outstanding technical education we must provide training in entrepreneurship and intrapreneurship. Our students must graduate with an understanding of how their work matters to the world, and how they can transform inventions and productivity-enhancing ideas into reality as efficiently as possible.

In these pages you will read stories of just a few of our remarkable inventors. The areas our students, faculty and alumni influence include health care, the environment, electronics and beyond. Their inventions are being propelled towards implementation in new ways, from an elevator pitch competition to a crowdfunding site that has garnered $2 million to see a product come to fruition. Their ideas are poised to change the world for the better.

The excitement in Buffalo is palpable, and UB is proud to be part of the renaissance.

Sincerely,

BUFFALO ENGINEER

Buffalo Engineer is published by the UB School of Engineering and Applied Sciences to showcase the excellence of our faculty, staff, alumni and students.

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SEAS Director of Experiential Learning Andrew Olewnik (right) introduces students to the product design process. The SEAS experiential learning programs encourage students to "engineer today" in addition to attending classes.

DEPARTMENTS

Onion Studio, Inc.

Douglas Levere

Onion Studio, Inc.

"Our project seeks to find ways to dispose of unwanted equipment and give these devices additional lives, " Sara Behdad, assistant professor.

Onion Studio, Inc.

Overcoming our e-waste problem

Admit it: You have a stash of old electronic devices. You'll probably never use them again, yet you keep them. The reluctance to part with mobile phones, laptops and other gizmos is part of a larger and more troubling issue: managing electronic waste, or e-waste.

"We need to create systems that encourage people to sell or trade-in these products in a timely manner so they can be refurbished and have two, three or even four life cycles before they are transformed into raw materials," said Sara Behdad, an assistant professor with a joint appointment in the departments of mechanical and aerospace engineering and industrial and systems engineering.

Behdad and industry partner, PC Rebuilders and Recyclers, received a $280,000 National Science Foundation grant to examine issues that contribute to e-waste. Ultimately, the goal is to use engineering concepts, such as the optimization of complex systems and processes, to reduce what the U.S. Environmental Protection Agency said is the nation's fastest growing domestic waste stream.

The research team is addressing these problems in two ways.

First, they are developing mathematical models that simulate consumer behavior and how design decisions contribute to e-waste. The models will consider issues such as consumer concern over data security, lack of awareness of recycling programs and sentimental attachment to certain products. Data from these experiments will improve estimates of how much, what types and when consumers will generate e-waste. In turn, this will enable recycling and refurbishing companies to improve the collection of e-waste and recovery of raw materials.

Secondly, the researchers will create an evaluation system to be used in the design process. For example, designers will be able to assess how using a certain type of metal or glue will affect how easily the product can be refurbished or recycled.

Find out more about Professor Behdad's project at *www.getcot.eng.buffalo.edu/.*

» Cory Nealon

Douglas Levere

UB engineers explore new ways to extend smartphone battery life

Charger-toting smartphone users have reason to rejoice. Three research groups in the Department of Computer Science and Engineering have received $1.3 million in combined funding to improve energy management in smartphones.

The grants were awarded by the National Science Foundation's Computer and Network System (CNS) Division, which supports research and education that lead to the invention of new technologies or the improvement of existing equipment.

Prioritizing energy with power agility

"Power agility," a project led by assistant professor Geoffrey Challen, is a system that allows users to prioritize the amount of energy a smartphone provides its applications.

The most efficient rate at which a phone can operate is the slowest, but this comes at the cost of the user's experience. The ideal inefficiency is the slowest speed at which an app can operate while maintaining a positive user experience.

Power agility attempts to compute the optimal inefficiency of smartphone apps and then provides the data to operating systems to assign energy-distribution priorities. The new system will allow users to prioritize apps based on importance.

Challen, together with graduate students Guru Prasad and Scott Haseley, is partnering with researchers at Drexel University on the study.

Power and performance tradeoffs in next generation WiFi

Most smartphone-technology advancements come at a cost to battery life. WiFi is no exception. Connecting to networks can account for up to 50 percent of a phone's power budget.

Dimitrios Koutsonikolas, assistant professor, Ramalingam Sridhar, associate professor, and Swetank Kumar Saha, doctoral candidate, are working on a project to measure power consumption in smartphones and develop models that will lead to new, efficient WiFi protocols.

The models will guide the design of new WiFi protocols that will allow the next generation of smartphones, tablets and laptops to experience faster data speeds without exhausting battery life.

Jouler, an energy management app

Challen and doctoral candidate Anudipa Maitii are working on a project that involves a new category of apps called energy managers.

Above: (from left) Dimitrios Koutsonikolas, Ramalingam Sridhar and Swetank Kumar Saha are working to improve the next generation of WiFi.

Their creation, Jouler—a play on the name for a unit of energy—is an Android app for Google Play that manages battery life for smartphone users. Its abilities include delaying tasks such as synching, changing the bandwidth of other applications and prioritizing the amount of energy apps are allowed to use.

» Marcene Robinson

Team receives collaborative stem cell training grant

UB is developing an innovative graduate training program to educate future leaders in stem cell research

A team of UB and Roswell Park Cancer Institute (RPCI) investigators led by Stelios Andreadis, professor and chair of the Department of Chemical and Biological Engineering, received a $1.85 million grant to create an interdisciplinary stem cell research training program.

The program, called *Stem Cells in Regenerative Medicine (SCiRM)*, will bring together 18 faculty members in the School of Engineering and Applied Sciences, School of Medicine and Biomedical Sciences, and Roswell Park's Graduate Division.

Successful translation of stem cell breakthroughs into cell therapies requires interdisciplinary approaches that draw from biology, medicine and bioengineering, but very few scientists or engineers are prepared to meet this challenge. With funding from New York State Stem Cell Science, the state's publicly funded agency tasked with making advancements in stem cell biology, the UB/RPCI team will meet this challenge by developing an innovative graduate training program to educate future leaders in this field.

The grant will support eight graduate students per year for five years.

Sriram Neelamegham, professor in the Department of Chemical and Biological Engineering, and Richard Gronostajski, professor in the Department of Biochemistry and Roswell's Department of Molecular and Cellular Biology, will serve as program co-directors.

"CanJam" joint among first to fly on NASA, Virgin Galactic flight

Douglas Levere

Manoranjan Majji

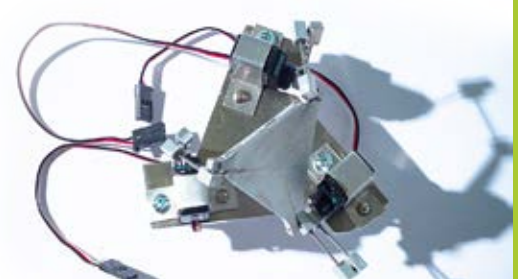
Gyroscope-aided bikes and cars may one day rule the road. But before the technology reaches the ground, a UB research team will test similar equipment in outer space.

The Canfield joint actuation manipulator—nicknamed "CanJam" by the researchers—was selected by NASA to join the first commercial research flight on Virgin Galactic's SpaceShipTwo.

The tennis-ball sized device was designed by Manoranjan Majji, lead researcher and assistant professor in the Department of Mechanical and Aerospace Engineering. "CanJam" can automatically control a satellite using a Canfield joint—a spherical joint that can point anywhere on a hemisphere—and an automated program that stabilizes the device when disturbed.

The manipulator allows a user to steer satellites using a wheel with three degrees of freedom: tilting forward and backward, swiveling left and right, and pivoting side to side. Unlike traditional joints, the device also contains three motors as a failsafe in the event one motor fails.

The UB project was chosen along with 11 other experiments through NASA's Flight Opportunities Program, which works with commercial companies, universities and government organizations to test innovative space technologies. NASA funded research and development of the designs.



Researchers shake California warehouse

A team led by Andreas Stavridis, assistant professor in the Department of Civil, Structural and Environmental Engineering, had a rare opportunity to test an earthquake-damaged building in El Centro, California, and bring it to the brink of collapse.

The researchers layered a century-old former warehouse with cameras, more than a hundred sensors and a shaker borrowed from the University of California, Los Angeles. They then shook the two-story structure at resonance frequency, which amplified the vibrations enough to feel the force from more than 200 yards away.

Andreas Stavridis

This building in El Centro, California, proved to be stronger than anticipated, although several walls were damaged in the test.

The data from the tests will be used to better understand how damaged buildings respond to vibrations and to improve tools used by engineers to simulate their seismic performance. The data will also be used to improve damage identification techniques and help develop a damage index for identifying the state of structures before and after extreme loading events.

The study, done in collaboration with Tufts University, is funded by the National Science Foundation. Stavridis was joined by UB doctoral candidate Sina Yousefian.

UB team designs brick-hauling robot for construction sites

Karthik Dantu and Nils Napp, both assistant professors of computer science and engineering, have teamed up with Michael Silver, assistant professor of architecture, to design, build and program a suite of tools that aims to bring robotics to construction sites.

The team has prototyped a series of increasingly complex bots—all dubbed OSCR, short for On-Site Construction Robot. The latest, which stands 18 inches tall and weighs just under 6 pounds, is designed to climb a ladder and carry three bricks—skills the researchers hope to demonstrate once programming of the bot is complete. The final prototype, with advanced grippers and powerful motors, will be able to stack five bricks, walk or crawl, and scan the site to track materials.

Paul Qaysi

OSCR-3, a prototype of the On-Site Construction Robot under development at UB.

Douglas Levere

Over 500 attend inaugural CDSE Days event

Five-day event highlights developments in the big data and data-intensive computing fields

The Computational and Data-Enabled Science and Engineering (CDSE) program hosted its inaugural CDSE Days, a weeklong event that highlighted developments in the burgeoning big data and big compute fields. Six keynote speakers presented their research and eight hands-on workshops were offered during the week of March 23-27, 2015.

"CDSE Days exposed our students to the many exciting possibilities and opportunities in this area. It brought leaders in the field to Buffalo, showcased our faculty and highlighted our pioneering efforts in program development. The mix of frontier topics and core skills was well appreciated by all," said Abani Patra, director of the CDSE program and professor of mechanical and aerospace engineering.

The CDSE program, one of UB's "E"-fund initiatives, is a collaboration between the School of Engineering and Applied Sciences, College of Arts and Sciences, School of Management, and School of Pharmaceutical Sciences. A PhD-granting program is planned for fall 2015.

Would you take dieting advice from a friend?

A person who finds success in a wellness program is more influential in getting friends to sign up than a charismatic but less successful pal, according to a study by occupational health researcher Lora Cavuoto, assistant professor of industrial and systems engineering.

The study, "Modeling the Spread of an Obesity Intervention through a Social Network," was published in the *Journal of Healthcare Engineering*.

"People want to see that positive influence," said Cavuoto. "Understanding how social influence affects people's participation in health programs can lead to better-designed wellness interventions."

Engineering doctoral candidate Mohammadreza Samadi and graduate student Mahboobeh Sangachin worked with Cavuoto on the study.

Douglas Levere

Lora Cavuoto

Happily ever after: Scientists arrange protein-nanoparticle marriage

Fastening protein-based medical treatments to nanoparticles isn't easy. With arduous chemistry, scientists can do it. But like a doomed marriage, the fragile binding that holds them together often separates. This problem, which has limited how doctors can use proteins to treat serious disease, may soon change.

A team led by Jonathan Lovell, assistant professor of biomedical engineering, has discovered a way to easily and effectively fasten proteins to nanoparticles—essentially an arranged marriage—by simply mixing them together.

The biotechnology model is described in the journal *Nature Chemistry*. The paper, "Functionalization of cobalt porphyrin–phospholipid bilayers with his-tagged ligands and antigens," is available here: *http://bit.ly/1yM4MpK*.

While in its infancy, the model already has shown promise for developing an HIV vaccine and as a way to target cancer cells.

The research is supported by the National Institutes of Health, with grants from the National Institute of Biomedical Imaging and Bioengineering, as well as its Early Independence Award program.

Co-authors are Shuai Shao and Jumin Geng, biomedical engineering; Shobhit Gogia and Sriram Neelamegham, chemical and biological engineering; and Hyun Ah Yi and Amy Jacobs, Department of Microbiology and Immunology; all from UB.

NEWS BRIEFS

Dean's Advisory Council member Dexter Johnson (in red shirt), of the NASA Glenn Research Center, speaks with Mark Plecnik of UC Irvine at the ASME conference.

Buffalo hosts ASME IDETC & ADMIF conference

In August 2014, UB served as host sponsor of the American Society of Mechanical Engineers (ASME) International Design Engineering Technical Conferences (IDETC) and the inaugural Advanced Design and Manufacturing Impact Forum (ADMIF), which attracted nearly 1,500 participants to Buffalo.

Venkat Krovi, an associate professor of mechanical engineering who served as General Conference Chair, was the driving force behind bringing this major event to Western New York and conceived the idea of the ADMIF to cultivate interactions between industry and academia.

Speakers included Helmuth Ludwig, CEO, Siemens Industry Sector, USA; Robert Brady, former Executive Chairman, Moog Inc.; Russ Agrusa, President and CEO, ICONICS; Bre Pettis, CEO, MakerBot; and many other engineering technology leaders.

An Opening Reception on the UB North Campus was organized by mechanical and aerospace engineering doctoral students Matthias Schmid and Mark Tomaszewski in collaboration with an outstanding team of individuals and organizations across UB.

Project aims to improve cloud computing

Chunming Qiao, professor and chair of computer science and engineering, is leading a project that aims to significantly advance the state-of-the-art in cloud computing research.

The research could lead to improvements in cloud service availability, performance and resource allocation, while minimizing costs and reducing losses in revenue due to service outages. It could also aid in the development of new cloud-based services and applications. The project is funded by the National Science Foundation.

Qiao teamed with Sanjukta Das Smith and Ram Ramesh, School of Management, and Thomas Furlani, Center for Computational Research, to carry out the research. Gregor von Laszewski of the Community Grids Lab at Indiana University is also collaborating with the research team.

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Andrew Whittaker

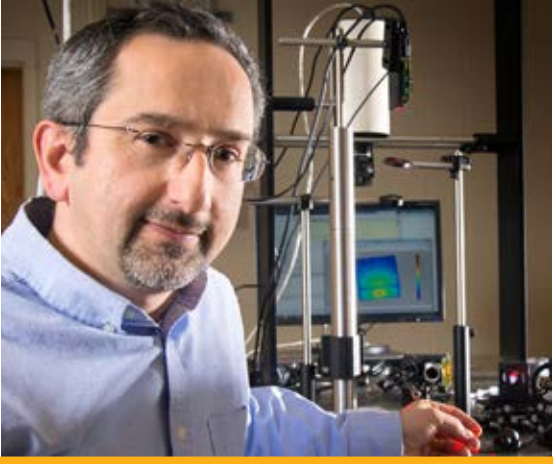
Douglas Levere

Leading earthquake engineer testifies before Congress

Andrew Whittaker, professor and chair of the Department of Civil, Structural and Environmental Engineering, and director of MCEER, testified before the Subcommittee on Research and Technology of the U.S. House of Representatives Committee on Science, Space and Technology, at a hearing to review the National Earthquake Hazards Reduction Program (NEHRP).

His key recommendations included a call for the U.S. Geological Survey to build out and maintain the Advanced National Seismic System and support its maintenance; and for the National Science Foundation to adequately support earthquake engineering research infrastructure and to provide funds to enable researchers to take full advantage of this infrastructure.

He also recommended NEHRP investments in lifelines, tools and technology to harden vulnerable buildings, the development of seismic isolators and dampers to protect high-value components in building and non-building structures, performance-based earthquake engineering for buildings and non-building structures, and funding of technology transfer, including a substantial strengthening of support for the Federal Emergency Management Agency.



Sandy Kicman

Ulas Sunar

Researchers develop device to find and destroy cancer cells

Ulas Sunar, research assistant professor of biomedical engineering, is developing a novel endoscopic device aimed at improving the ability to detect and destroy cancer cells.

The new endoscope uses spatial frequency domain imaging to produce a high-contrast map of the tumor environment. The innovative technique projects patterns of light at different frequencies on the cancer cells and corrects the image contrast for the light attenuation.

The device thus overcomes the limitations of conventional endoscopic imaging, and improves doctors' ability to visualize tumors.

The endoscope will work in tandem with tiny nanoballoons, a technology being developed by Jonathan Lovell, assistant professor of biomedical engineering, to target cancer cells.

When the nanoballoons reach the cancer cells, doctors strike them with the endoscopic light beam, causing them to pop open and release the chemotherapy drugs they carry. This precision targeting protects healthy cells, thereby reducing side effects.

To effectively target the nanoballoons, doctors need to control the light beam. Sunar is developing a "digital mask" that adjusts the beam's intensity and manipulates its shape down to micron precision by using a computer.

The project is supported by a grant from the National Institute of Biomedical Imaging and Bioengineering.

One nanoparticle, six types of medical imaging

It's technology so advanced that the machine capable of using it doesn't yet exist. Using two biocompatible parts, a research team led by Jonathan Lovell, assistant professor of biomedical engineering, has designed a nanoparticle that can be detected by six medical imaging techniques: Computed Tomography (CT) scanning, Positron Emission Tomography (PET) scanning, photoacoustic imaging, fluorescence imaging, upconversion imaging and Cherenkov Luminescence Imaging (CLI).

In the future, patients could receive a single injection of the nanoparticles to have all six types of imaging done.

"This nanoparticle may open the door for new 'hypermodal' imaging systems that allow a lot of new information to be obtained using just one contrast agent," said Lovell. "Once such systems are developed, a patient could theoretically go in for one scan with one machine instead of multiple scans with multiple machines."

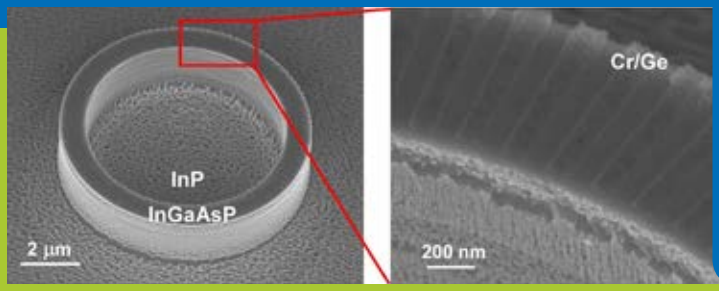
When Lovell and colleagues used the nanoparticles to examine the lymph nodes of mice, they found that CT and PET scans provided the deepest tissue penetration, while the photoacoustic imaging showed blood vessel details that the first two techniques missed.

Differences like these mean doctors can get a much clearer picture of what's happening inside the body by merging the results of multiple modalities.

The research, "Hexamodal Imaging with Porphyrin-Phospholipid-Coated Upconversion Nanoparticles," was published in the journal *Advanced Materials*.

Co-authors include Paras N. Prasad, executive director of UB's Institute for Lasers, Photonics and Biophotonics (ILPB); Guanying Chen and Wei Shao, Harbin Institute of Technology, China and the ILPB; James Rieffel, Shuai Shao and Upendra Chitgupi, Department of Biomedical Engineering at UB; Feng Chen, Reinier Hernandez, Stephen A. Graves, Robert J. Nickles and Weibo Cai, University of Wisconsin, Madison; and Jeesu Kim and Chulhong Kim, POSTECH, Pohang, Korea.

Improving the quality of lasers



Courtesy of Liang Feng

Scanning electron microscope images of the fabricated parity-time symmetric microring laser.

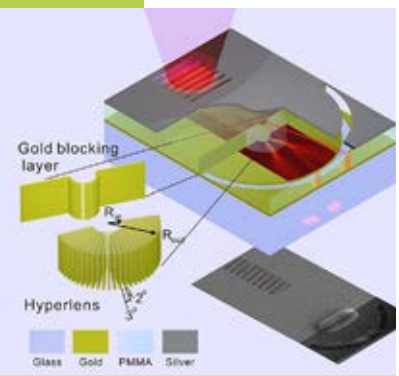
Liang Feng, assistant professor in the Department of Electrical Engineering, is developing a strategy to effectively manipulate the cavity resonant modes in lasers on-demand. The work aims to eliminate optical loss from lasers, which can result in poor beam quality, among other issues.

In a recent paper entitled "Single-mode laser by parity-time symmetry breaking," Feng describes a laser system based on microring cavities that carefully control the amount of loss and gain within each component. The interplay between the loss and gain results in enhanced and cleaner emission from the lasers.

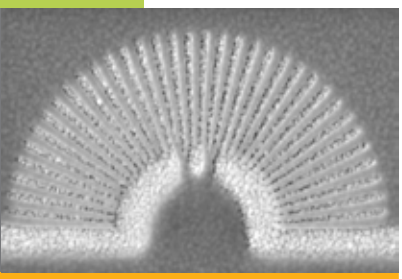
The paper was published in Science magazine. Co-authors were Zi Jing Wong, Ren-Min Ma, Yuan Wang and Xiang Zhang, all of the NSF Nanoscale Science and Engineering Center, University of California, Berkeley.

This Slinky lookalike "hyperlens" helps us see tiny objects

Natalia Litchinitser



Light passes through the metamaterial hyperlens, improving the resolution of very small objects.



Close-up view of a metamaterial hyperlens. The light-colored slivers are gold and the darker ones are PMMA (a transparent thermoplastic).

It looks like a Slinky suspended in motion. Yet this photonics advancement—called a metamaterial hyperlens—doesn't climb down stairs. Instead, it improves our ability to see tiny objects.

Described in a research paper published by the journal *Nature Communications* and entitled "Experimental demonstration of a non-resonant hyperlens in the visible spectral range," the hyperlens may someday help detect some of the most lethal forms of cancer.

"There is a great need in health care, nanotechnology and other areas to improve our ability to see tiny objects that elude even the most powerful optical systems. The hyperlens we are developing is, potentially, a giant step toward solving this problem," said Natalia Litchinitser, professor of electrical engineering and the paper's lead author.

Co-authors are Jingbo Sun, assistant research professor of electrical engineering, and Mikhail I. Shalaev, a PhD candidate in Litchintser's lab.

Conventional optical systems, such as microscopes and cameras, are limited by diffraction, a phenomenon in which light bends as it passes around an edge or through a slit. Diffraction sets a fundamental limit to the resolution of optical systems.

Metamaterial hyperlenses overcome the diffraction limit by transforming decaying evanescent waves into propagating waves. Once converted, the former decaying waves, which were commonly lost in conventional imaging, can be collected and transmitted using standard optical components.

Some of the first experimental metamaterial hyperlenses consisted of tiny concentric rings of silver and dielectric. However, it turns out that they work only in a very narrow range of wavelengths and suffer from large losses. On the other hand, the fan-shape or Slinky-like design demonstrated by the UB team solves both of these problems. The design overcomes the diffraction limit in the visible frequency range and can be integrated with an optical waveguide, opening the door to hyperlens-based medical endoscopes.

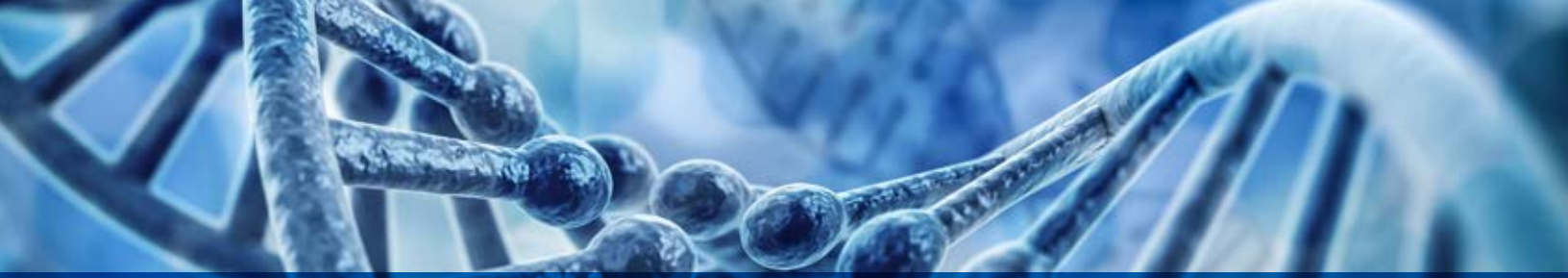
For example, today's high-resolution endoscopes can resolve objects to about 10,000 nanometers. The hyperlens could improve that to at least 250 nanometers or better. This is important because the earlier doctors are able to discover hard-to-find cancers, the more success they have in treating the disease.

Another potential application centers on optical nanolithography, the process of passing light through a mask to a pattern on polymer film. Continuous improvement in this field is essential to building the next generation of optoelectronic devices, data storage drives, sensors and other gadgets.

The hyperlens also shows promise in analyzing single molecules, a potential advancement with broad implications in numerous fields of research, including physics, chemistry and biology.

The research was supported by grants from the U.S. Army Research Office and the National Science Foundation.

» Cory Nealon



A hybrid vehicle that delivers DNA

New transport system for DNA vaccines could help treat HIV, malaria, HPV and other major illnesses

A new hybrid vehicle is under development. Its performance isn't measured by the distance it travels, but rather the delivery of its cargo: vaccines that contain genetically engineered DNA to fight HIV, cancer, influenza and other maladies.

Described recently in the *Proceedings of the National Academy of Sciences*, the technology is a biomedical advancement that could help unleash the potential of DNA vaccines, which despite two decades of research, have yet to make a significant impact in the treatment of major illnesses.

"The technology that we're developing could help take immunization to the next level," said Blaine A. Pfeifer, associate professor in the Department of Chemical and Biological Engineering. "By improving the delivery of DNA vaccines, we can potentially harness the human immune system in new ways to fight everything from the flu and herpes to HIV and cancer."

To create the vaccines, researchers analyze disease-causing sources, such as a pathogenic microbe. They then isolate copies of the microbe's genes (usually one or two) responsible for the disease.

The genetically engineered DNA is injected into the body, whereupon being processed by the immune cells, directs the production and presentation of antigens, which provoke an adaptive immune response capable of destroying the disease.

A problem limiting the effectiveness of some DNA vaccines, however, is that they do not sufficiently stimulate the immune system. Scientists say this is due, in part, to the inefficient delivery of the genes.

To address the problem, Pfeifer and his students collaborated with Anders Hakansson, formerly of the UB School of Medicine and Biomedical Sciences.

The team combined two delivery vehicles—a bacterial cell and a synthetic polymer—to create a hybrid. Designed to target specific immune cells (antigen-presenting cells) and more efficiently deliver genes to the nucleus of those cells, the hybrid outperformed the two individual delivery vehicles when tested in a mouse model.

"The hybrid provided a synergistic boost in delivery effectiveness due to its dual nature," said Charles H. Jones, a doctoral candidate in the Department of Chemical and Biological Engineering. "We also determined that it's relatively inexpensive to create and flexible in terms of use. The results thus far are very encouraging."

The team continues to test the vehicle in different models. The goal, Pfeifer said, is to create a vehicle that will be useful for many DNA vaccines.

The research is supported by the National Institutes of Health and by UB's Arthur A. Schomburg Fellowship Program.

» Cory Nealon

Charles Jones (left) and Blaine Pfeifer (right) are developing new technology to improve DNA vaccines.

Onion Studio, Inc.

STUDENT INGENUIT

Enterprising innovations from an engineering education

"UB exposed me to all of these technologies and provided me with the tools that I needed to develop the suitcase."

Martin Diz, PhD '15,
Aerospace engineering

Douglas Levere

1

Martin Diz shows off Bluesmart, the world's first "smart" suitcase.

Y

By Jim Bisco, Marcene Robinson and Jane Stoyle Welch

Onion Studio, Inc.

Suitcase. Shoes. Office chairs. Concrete. Some of the everyday items that are taking on ingenious new meaning through the enterprising brainpower of students bent on improving the health, safety and convenience of our lives. Here are some of the young innovators who have derived inspiration for their creations within the walls of UB's School of Engineering and Applied Sciences.

1. A carry-on that charges your smartphone (and more)

It has been 45 years since the last innovation on the suitcase—the addition of wheels to make rolling luggage and an easier transport. The time had come, according to Martin Diz, a 2015 PhD graduate from the SEAS aerospace engineering program, for the carry-on to carry forward. "Everything today is smart, but there are no smart suitcases. We realized a major redesign was required. So we set out to think how the carry-on for this century should be made."

Diz is co-founder and head of engineering for Bluesmart, a company that has developed a carry-on that uses digital technology to solve some of the problems that frustrate many travelers.

The Bluetooth-driven suitcase packs a microcomputer, a battery for charging smartphones on the go, a sensor for tracking the luggage's location, and a built-in digital scale for weighing the case. The case is accompanied by a mobile application that serves as a personal travel assistant.

"The suitcase will give you the ability to forget about your trip," said Diz. "You have to check the weather, decide what to pack and remember what time to leave for the airport. Now, the app and the suitcase will do these for you."

The project was met with overwhelming support by the public. Diz and his five co-founders placed Bluesmart on Indiegogo, a crowdfunding website, with the goal of raising $50,000 in startup funds. They surpassed that total in two hours, and have exceeded $2 million in contributions.

Travelers can recharge Bluesmart in as little as five hours with their laptop or tablet cable, though the suitcase will also be shipped with its own charge cord. The case is preapproved by the Transportation Security Administration.

With orders from around the world, the technology will soon touch the hands of thousands.

But, designing groundbreaking gizmos is nothing new for Diz.

He designed autopilots for aircrafts and space vehicles as part of his doctoral research. One of his projects, a joint manipulator that can direct the flight of satellites or helicopters, was selected by NASA and Virgin Galactic to fly on a commercial research flight (see story on page 4).

"I've been using a lot of sensors for the suitcase, and that was 50 percent of my work with autopilots," said Diz, who studied under Manoranjan Majji, assistant professor in the Department of Mechanical and Aerospace Engineering. "UB exposed me to all of these technologies and provided me with the tools that I needed."

The suitcase will be selling for around $500 but is now available on the Indiegogo site at a substantial discount: *www.indiegogo.com/projects/bluesmart-world-s-first-smart-connected-carry-on#/story.*

ABOVE: Started in the fall of 2014 by mechanical and aerospace engineering senior Connor McCafferty, Design Club offers students an opportunity to turn ideas into functioning technologies. Its mission is to encourage entrepreneurship by supporting project idea pitches, interdisciplinary team building, development protocols and prototyping funds, and to give students real-world experiences through both long- and short-term design challenges.

2. eLab helps students develop business startups

Four SEAS students earned $8,000 in seed funding, mentorship, and shared space in the UB Technology Incubator as the winners of UB's Entrepreneurship Lab (eLab), a boot camp-style course offered during UB's three-week winter session. They were among 14 UB students who pitched their startups to a panel of local business leaders and investors. The concepts of the entrepreneurial hopefuls in the competition, described below, range from better protection for buildings and communities from flooding and storms to the ultimate computer search engine.

eLab is a partnership between the School of Management and the Office of Science, Technology Transfer and Economic Outreach (STOR).

The Company and the Concept	The Entrepreneur
PreMeR X Inspired by nature, a novel resin-based chemistry process that can capture and recover precious metal, such as gold, silver and platinum, from wastewater.	**Mahmoud Kamal Ahmadi,** a PhD student in chemical and biological engineering from Torbat-e Jam, Iran
interactiveX A learning platform to make e-books more interactive. The application creates fully interactive e-books that can run simulations, take notes and ask questions of a professor.	**Rohan Shah,** undergraduate from Buffalo, NY, studying computer science and business; co-founded with partner Matthew Cuciti
Smart Walls Deployable precast concrete walls buried in the ground that can protect buildings or entire communities from flood water and storm surges.	**Jorge Cueto,** a doctoral student in civil engineering from Bogota, Colombia
Igloo An intuitive search engine that can quickly and simultaneously comb through and locate files on company servers, an individual's computer and cloud applications.	**Joseph Peacock,** undergraduate computer engineering major from Tonawanda, NY

Douglas Levere

Douglas Levere

3

Kevin Carter

Improved cancer drug delivery wins UB's Panasci competition

Kevin Carter, a biomedical engineering student from Georgetown, Guyana, and Jonathan Lovell, assistant professor of biomedical engineering, are the co-inventors of a new technology that offers an effective and minimally invasive way to deliver cancer drugs.

That is the idea behind PhotoZyne, a biotechnology startup founded by a team of UB graduate students that won first place in UB's Henry A. Panasci Jr. Technology Entrepreneurship Competition.

A "smart" nanoballoon is used to safely deliver cancer treatments directly to solid tumors. Administered intravenously, the drug is then activated by exposure to a special laser light probe. According to the creators, the focused delivery will help to decrease recurrence, resistance and side effects.

Carter brought in Michael Bisogno, an MD/MBA student of Smithtown, NY, and Jonathan Smyth, a third-year law student, of Syracuse, NY, to bring the product to market.

Their victory earned them $25,000 in startup capital and more than $27,000 worth of in-kind services for the venture.

4. Top floor in elevator pitch competition

The shark-tank style competition followed the premise of a student obtaining a chance meeting with an investor in an elevator. Armed with nothing more than their voices, 60 student teams stepped from an eight-foot tall elevator to pitch their businesses in 90 seconds to a panel of judges from Buffalo's entrepreneurial community.

At the conclusion, mechanical engineering undergraduate Ansh Pandey was one of three $1,000 winners in UB's Elevator Pitch Competition.

Pandey pitched his idea to form DreaMaker, a 3D metal printing company that can print metal objects of complex shapes and a large range of sizes at an affordable cost. Based on a soon-to-be patented technology from UB's Composite Materials Research Laboratory, the technology targets the aerospace, automobile, construction and electronic packaging sectors. The laboratory is led by Deborah Chung, Niagara Mohawk Chair Professor of Materials Research, Department of Mechanical and Aerospace Engineering.

5. Bringing new products to market

What if a consumer product could "observe itself" and report these observations back to a team of product designers?

That is the central question in an on-going research project that seeks to better measure consumer perceptions and customize products accordingly.

Called cyber-empathic design, the researchers are embedding sensors in a variety of everyday products such as shoes and office chairs. The sensors will be used to provide quantitative and efficient measures of consumer perceptions and how these opinions correspond to product features.

For example, this summer, volunteers at UB's campus dining services are wearing shoes with a special insert that contains 13 sensors. The sensors monitor such things as foot dynamics, whether the subject walks on the outside of the foot, force of the impact of the foot striking the ground, temperature and other such factors in real-time. The sensor data will then be coupled with survey data and analyzed to inform the design of the shoe.

The results could impact the way that products are designed, tested and manufactured in the future.

The research team includes SEAS director of experiential learning programs and adjunct assistant professor Andrew Olewnik, PhD student Dipanjan Ghosh, undergraduate Rei Yoshinaga, and professor and chair Kemper Lewis, all of the Department of Mechanical and Aerospace Engineering, and Arun Lakshmanan, assistant professor of marketing in the School of Management.

From left, Dipanjan Ghosh, Andrew Olewnik and Rei Yoshinaga are using sensors to correlate product use with consumer opinions.

Onion Studio, Inc.

Amit Goyal named director of RENEW

Douglas Levere

"I am very excited to join UB and lead RENEW. The institute focuses on some of the most important grand challenges of our time. This is indeed a unique time for Buffalo and the New York region, with major new and planned investments in science, engineering and manufacturing. The possibilities truly are compelling."

– Amit Goyal, Director of RENEW

Amit Goyal, an internationally recognized materials scientist, has been named director of RENEW, UB's new interdisciplinary institute dedicated to research and education on globally pressing problems in energy, environment and water.

As director of RENEW (Research and Education in eNergy, Environment and Water), Goyal will foster collaborations among UB faculty, coordinate new searches for faculty associated with RENEW, coordinate with academic departments to develop undergraduate and graduate programs, and establish partnerships with organizations, agencies and community leaders.

RENEW's research thrusts will address a variety of prominent issues, such as energy diversification; freshwater protection and restoration; ecosystem science, engineering and policy; societal adaptation to changing environments and the green economy; public health; and environmental management and governance.

Goyal has developed clean energy technologies for over two decades. He has authored more than 350 technical publications and has more than 80 issued patents, with more than 20 patents pending. He has received numerous accolades including the DOE's E.O. Lawrence Award in the inaugural category of Energy Science & Innovation, bestowed by the Energy Secretary on behalf of the U.S. President, and was the most cited author worldwide in the field of high-temperature superconductivity from 1999 to 2009.

Goyal is an elected fellow of nine professional societies: National Academy of Inventors, American Association for Advancement of Science, Materials Research Society, American Physical Society, World Innovation Foundation, American Society of Metals, Institute of Physics, American Ceramic Society and World Technology Network.

He concurrently holds the title of Empire Innovation Professor, based in the Department of Chemical and Biological Engineering, and remains as Emeritus Corporate Fellow and Distinguished Scientist at Oak Ridge National Laboratory. In addition, he is the Founder, President and CEO of TapeSolar Inc., and the Founder, President and CEO of TexMat LLC.

Visit *www.buffalo.edu/RENEW* to learn more about this exciting initiative.

» Cory Nealon

UB is investing $25 million over the next five years in Communities of Excellence, to address critical societal challenges through impactful interdisciplinary research, education and engagement.

Sustainable Manufacturing and Advanced Robotic Technologies (SMART)

SMART will build upon UB's reputation as a leader in advanced manufacturing and design by developing the next generation of manufacturing, technologies, processes and education that enable sustainable, cost-effective production of high-quality, customizable products. SMART will leverage university and regional strength in manufacturing, and partner with regional companies to educate future manufacturing leaders and shape national policy.

Co-leaders are Kemper Lewis and Ken English of the School of Engineering and Applied Sciences, and Omar Khan and Michael Silver of the School of Architecture and Urban Planning.

Global Health Equity

This community will work to address the challenge of global health inequity by bringing together faculty and students from the health sciences and disciplines that are focused on the social, economic, political and environmental conditions that lead to inequities. This community will tackle problems ranging from a lack of access to sanitation for women and girls in poor countries to high rates of non-communicable diseases due to complex sets of factors.

Co-leaders are Li Lin, the School of Engineering and Applied Sciences, Pavani Ram, School of Public Health and Health Professions, and Korydon Smith and Samina Raja, School of Architecture and Urban Planning.

The Genome, the Environment and the Microbiome (GEM)

GEM will work to advance understanding of areas that will enable development of personalized medicine and empower individuals to have greater control over and understanding of their health, the human genome and the human microbiome.

To find out more, visit *www.buffalo.edu/newsreleases/2015/05/047.html*

Swihart named executive director of UB's New York State Center of Excellence in Materials Informatics

Nancy J. Parisi

CMI researchers are developing new nanomaterials with applications in biomedical imaging and therapy.

Mark Swihart, UB Distinguished Professor of Chemical and Biological Engineering, has been named executive director of UB's New York State Center of Excellence in Materials Informatics (CMI).

Swihart succeeds Alexander N. Cartwright, who had served as interim executive director before being named provost and executive vice chancellor of the State University of New York system.

Mark Swihart

Swihart is an acclaimed researcher, teacher and collaborator. As director of the UB 2020 Strategic Strength in Integrated Nanostructured Systems since 2007, he has guided the university's diverse nanoscience and nanotechnology research.

In his new role, he will work with an established administrative and operations team to advocate for the university's technology-based economic development programs and cultivate industry collaboration, while further growing UB's expertise and reputation in the fast-moving field of materials informatics.

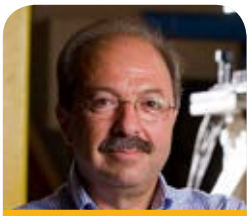
"Dr. Swihart has excelled in his position, assembling interdisciplinary faculty teams to partner with private industry in pursuit of major funding opportunities. He is a well-regarded researcher and colleague with established corporate relationships. We have full confidence that CMI will thrive with Dr. Swihart at the helm," said Venu Govindaraju, UB's interim vice president for research and economic development.

Swihart's research, funded primarily by the National Science Foundation, the Air Force Office of Scientific Research and industry, is focused on the creation of new nanomaterials with applications in optoelectronics, such as light-emitting diodes and solar cells; in biomedical imaging and therapy; and in diverse energy-related applications.

Swihart is co-holder of five U.S. patents and has served on the scientific advisory boards of several startup companies. He has authored or co-authored more than 150 peer-reviewed journal manuscripts. Since joining the UB faculty in 1998, he has served as research advisor to more than 50 graduate and 90 undergraduate students.

Two named SUNY Distinguished Professors

Appointment is the highest faculty rank in the SUNY System



Michael Constantinou

Michael Constantinou, professor of civil, structural and environmental engineering, was named SUNY Distinguished Professor. He is one of the world's leading scholars in the area of seismic protective systems, and his research has been employed to ensure the stability and safety of structures located in seismically active areas, from the San Francisco International Airport to off-shore oil and gas platforms in Russia, to several seismically isolated hospitals and the new Apple Campus building, currently under construction in California. He was recently awarded ASCE's Newmark Medal (see story on page 18). Constantinou joined the UB faculty in 1988.

Johannes Nitsche

Johannes Nitsche, professor and director of undergraduate studies in the Department of Chemical and Biological Engineering, was named SUNY Distinguished Teaching Professor. Nitsche, who joined UB in 1990, is internationally known for his theoretical research in biological transport processes and dermal absorption. His teaching efforts have been recognized with numerous awards, among them the 1995 Chancellor's Award for Excellence in Teaching and designation as American Institute of Chemical Engineer's Professor of the Year in 1996, 2002 and 2005.

FACULTY HONORS AND AWARDS

John Crassidis, CUBRC Professor in Space Situational Awareness, Department of Mechanical and Aerospace Engineering, was selected as a Fellow of the American Institute of Aeronautics and Astronautics (AIAA). AIAA confers the distinction of Fellow upon individuals in recognition of their notable and valuable contributions to the arts, sciences or technology of aeronautics and astronautics.

Christine Human was named 2014 Educator of the Year by the Erie-Niagara Chapter of the New York State Society of Professional Engineers. The award recognizes an individual whose activities or contributions in the field of education have broad and lasting effects on the goals of the engineering profession or the Society of Professional Engineers. Human is associate dean for accreditation and student affairs and a lecturer in the Department of Civil, Structural and Environmental Engineering.

David Kofke, SUNY Distinguished Professor in the Department of Chemical and Biological Engineering, was named a fellow of the American Association for the Advancement of Science (AAAS). Kofke was recognized for his contributions to the fields of thermodynamics of fluids and the statistical mechanics of molecular systems.

Venkat Krovi, associate professor in the Department of Mechanical and Aerospace Engineering, received a Distinguished Service Award at the Fifth Annual National Travel & Tourism Beacon Awards, held May 4, 2015, in Buffalo. Krovi led UB's efforts to bring an American Society of Mechanical Engineers' conference to Buffalo last summer. The event had a $1.4 million economic impact in Western New York, according to Visit Buffalo Niagara.

George Lee's pioneering work in developing a relationship between UB and China was recognized by the UB Confucius Institute, which organized a symposium in his honor and presented him with the Confucius Educator Award on May 5, 2015. Lee signed a historic exchange agreement with Beijing Polytechnic University in 1980, making UB the first U.S. university to establish formal ties in China following the normalization of U.S.-China relations. Lee is a SUNY Distinguished Professor Emeritus.

Kemper Lewis, professor and chair of mechanical and aerospace engineering, was elected to the ME Department Heads/Chairs Executive Committee, a standing committee of the American Society of Mechanical Engineer's Board on Education. The term is for three years.

Natalia Litchinitser, a professor in the Department of Electrical Engineering, was elected as a Fellow of the American Physical Society (APS). She was recognized for her "fundamental contributions to linear and nonlinear light-matter interactions in metamaterials and structured light interactions with nanostructures." Her nomination was approved by the Council of the APS upon recommendation of the Division of Atomic, Molecular and Optical Physics.

Carl Lund, SUNY Distinguished Teaching Professor in the Department of Chemical and Biological Engineering, was named a Fellow of the American Institute of Chemical Engineers (AIChE). Lund was recognized for his accomplishments in teaching, service to the field and research on heterogeneous catalysis.

Abani Patra was selected as a Fellow of the U.S. Association for Computational Mechanics (USACM). The award recognizes individuals with a distinguished record of research, accomplishment and publication in the area of computational mechanics and demonstrated support of the USACM through membership and participation in the association, its meetings and activities. Patra received the award at the 13th U.S. National Congress on Computational Mechanics, held July 27-30, 2015 in San Diego, California.

Chi Zhou, assistant professor, industrial and systems engineering, was one of 11 young faculty to receive the 2015 Outstanding Young Manufacturing Engineer Award from the Society of Manufacturing Engineers (SME). According to SME, "The SME Outstanding Young Manufacturing Engineer Award is conferred in recognition of significant achievements and leadership in the field of manufacturing engineering as a young engineer."

Jaroslaw Zola was part of a working group that identified challenges, risks and rewards summarized in a recently published report on big data in the life sciences. The report, entitled "National and Transnational Security Implications of Big Data in the Life Sciences," is the result of a one-year study jointly organized by the American Association for the Advancement of Science (AAAS), Federal Bureau of Investigation (FBI), and United Nations Interregional Crime and Justice Research Institute (UNICJR). Zola is an assistant professor of computer science and engineering and research assistant professor in biomedical informatics.

Borazjani receives NSF CAREER award to study fluid-structure interaction in biological flows

Douglas Levere

Iman Borazjani's research aims to improve the performance of wind turbines and other energy harvesting devices by replicating and adapting the propulsion mechanism used by aquatic animals.

Inspired by how aquatic animals are naturally able to increase their speed in water, Iman Borazjani, assistant professor in the Department of Mechanical and Aerospace Engineering, is investigating whether their propulsion mechanism can be replicated and adapted to improve the performance of wind turbines and other energy harvesting devices.

Funded by the National Science Foundation through its Faculty Early-Career Development (CAREER) Award program, Borazjani's research will develop advanced computational tools that can simulate the interaction of flow with solid bodies. Then, the flow separation of the front edge of the fins of aquatic animals, known as the leading edge vortex (LEV) and thought to enhance propulsion, will be investigated to determine the conditions that lead to energy efficiency.

"Professor Borazjani's CAREER Award allows for the creation of a novel computational framework to address a broad range of technologically important fluid-structure interaction problems, in biomechanics and for advanced propulsion and energy harvesting applications. We are very excited that his important work has been recognized with this award," said Kemper Lewis, professor and chair, mechanical and aerospace engineering.

Videos that convey the research results in a simple, yet aesthetically pleasing way, are part of the educational component of the research. In addition, Borazjani will create activities for professional development of local teachers as well as outreach activities for high-school students in collaboration with the BEAM (Buffalo Engineering Awareness for Minorities) program. The videos will be added to YouTube and will be on display at the Buffalo Museum of Science.

Borazjani joined UB's School of Engineering and Applied Sciences in 2010. In addition to the CAREER award, he has received a scientist development grant from the American Heart Association and the Doctoral New Investigator award from the American Chemical Society. He received his PhD in mechanical engineering with a minor in mathematics from the University of Minnesota in 2008.

The prestigious National Science Foundation CAREER Award recognizes junior faculty who have shown exceptional promise in teaching and research.

» Jane Stoyle Welch

Three receive SUNY Chancellor's Awards for Excellence in Scholarship and Creative Activities

SUNY Chancellor's Awards for Excellence in Scholarship and Creative Activities recognize the work of faculty who actively engage in scholarly and creative pursuits beyond their teaching responsibilities. Three SEAS faculty were honored with the award in 2015.

Stella Batalama was recognized for her contributions to the study of communication and signal processing. Batalama joined UB in 1995. She served as associate dean for research in the School of Engineering and Applied Sciences from 2009-2011, and is chair of the Department of Electrical Engineering.

Ann Bisantz was recognized for her contributions to the study of human factors engineering. A faculty member since 1997, Bisantz received a CAREER award from the National Science Foundation and a Young Investigator Award from UB. She is chair of the Department of Industrial and Systems Engineering.

Sriram Neelamegham was recognized for his contributions to the field of bioengineering, particularly his work in the area of systems glycobiology. Neelamegham, professor of chemical and biological engineering, serves as co-director of UB's Center for Biomedical Engineering, and was recently named co-director of the Stem Cells in Regenerative Medicine program (see story on page 4). He joined UB in 1997.

Batta receives IIE's Holzman Distinguished Educator Award

Douglas Levere

SUNY Distinguished Professor Rajan Batta discusses a research project with graduate student Azar Sadeghnejad. The majority of Batta's journal papers have been co-authored with current and former students.

Rajan Batta is the 2015 recipient of the Albert G. Holzman Distinguished Educator Award, the highest teaching award given by the Institute of Industrial Engineering (IIE).

The award recognizes educators who have contributed significantly to the profession through teaching, research and publication, extension, innovation, or administration. Only one award is given per year.

Batta, a SUNY Distinguished Professor and IIE Fellow, has been enthusiastically teaching classes for more than 30 years in the School of Engineering and Applied Sciences' Department of Industrial and Systems Engineering. He has supervised or co-supervised 41 doctoral students, and currently teaches graduate classes in stochastic methods, facilities design and urban operations research. Batta also serves as the associate dean for faculty affairs in the School of Engineering and Applied Sciences.

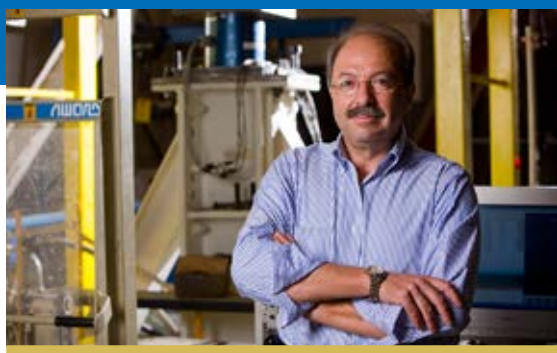
"Rajan's students consistently emphasize his caring attitude and the tremendous impact his mentorship has had on their careers," said Ann Bisantz, professor and chair of the industrial and systems engineering department. "His teaching excellence and concern for students have also been recognized by numerous awards, including a SUNY Chancellor's Award for Excellence in Teaching as well as UB's Excellence in Graduate Student Mentoring award."

Batta uses industrial engineering techniques, such as operations research, to develop and analyze mathematical models of systems critical to society. His current work includes hazardous materials routing/logistics, UAV routing/scheduling for search missions, convoy routing, routing/scheduling of automated guided vehicles, modeling repair of a transportation network, gasoline supply logistics, and electric vehicle routing and location of charging stations.

This is the second distinguished award that Batta has received from IIE. In 2008, he was honored with the David F. Baker Distinguished Research Award.

Constantinou receives ASCE Newmark Medal

Fourth winner for UB since 2000



Douglas Levere

Michael Constantinou is recognized as one of the world's leading scholars in the area of seismic protective systems.

Michael Constantinou, SUNY Distinguished Professor in the Department of Civil, Structural and Environmental Engineering, has won the prestigious Nathan M. Newmark Medal from the American Society of Civil Engineers (ASCE).

He was recognized by the ASCE "for significant contributions to the innovation, theoretical development, experimental verification, creation of design standards, assisting practicing professionals in real-life implementations, and educating new generations of professionals in further developments of protective systems for infrastructure against catastrophic shocks and vibrations."

He was cited in particular for developing sliding seismic isolation systems and fluid viscous damping systems.

The Newmark Medal is a highly prestigious recognition, with just one recipient selected each year. Past UB winners of this competitive award include George Lee (2000), Tsu-Teh Soong (2002) and Andrei Reinhorn (2011), a unique achievement among competing institutions in which only one other institution in the U.S.—University of California, Berkeley—has had more winners than UB.

Constantinou has had a profound impact on earthquake engineering in the U.S. and around the globe. He has served as a consultant or peer reviewer for more than 100 structures with seismic protective systems in 19 countries.

During his 28-year tenure at UB, he has served as chair of the Department of Civil, Structural and Environmental Engineering and as director or deputy director of the Structural Engineering and Earthquake Simulation Laboratory. He was principal or co-principal investigator on more than $30 million in externally funded research.

He is the author or co-author of more than 300 papers, books and book chapters, and reports, and has four patents issued or pending.

World-renowned computational chemist Michel Dupuis joins UB

Onion Studio, Inc.

Nina Tyminska and Michel Dupuis are designing new chemical calculations.

Michel Dupuis, a world-renowned computational chemist, joined the Department of Chemical and Biological Engineering (CBE) and the Computation and Data-enabled Science and Engineering (CDSE) program in January 2015. He is also a member of the New York State Center of Excellence in Materials Informatics (CMI).

Dupuis, who came to UB from the Pacific Northwest National Laboratory where he was a laboratory fellow, will focus his research on large-scale computations relevant to energy conversion and storage.

One of his current projects in collaboration with postdoctoral researcher Nina Tyminska and CBE assistant professor Gang Wu involves fundamental aspects of photoelectrochemical cell chemistry to split water and generate hydrogen as a fuel. Dupuis and Tyminska are applying large-scale first principles simulation approaches to study the oxygen evolution reaction (OER) catalyzed by reducible oxide perovskites. The research could lead to breakthroughs in the use of alternate fuel sources. Other projects in the Dupuis group deal with the development of new methods and computer codes for chemistry simulations.

Dupuis is a Fellow of the American Physical Society and the American Association for the Advancement of Science, and a member of the prestigious International Academy of Quantum Molecular Science. He has co-authored more than 200 refereed journal publications, which have been cited more than 20,000 times.

Over the years he has made key contributions to the development of methods and algorithms for high performance quantum chemical calculations, and for recent applications to new energy technologies.

Dupuis previously worked at the Lawrence Berkeley National Laboratory and IBM. He received his PhD in 1976 in theoretical chemistry from UB, where he studied under Professor Harry F. King.

In Memoriam

Walter J. "Jim" Sarjeant, an emeritus chair professor of electrical engineering who worked at Los Alamos National Laboratory on what eventually became the International Space Station, died April 2, 2015, in Naples, Florida. He was 70.

Born in Strathroy, Ontario, Sarjeant received bachelor's, master's and doctoral degrees from the University of Western Ontario in 1966, 1967 and 1971, respectively.

He worked at Lumonics Research and the National Research Council of Canada before becoming a staff member at Los Alamos from 1978 to 1981.

A faculty member and tenured professor at UB since 1981, Sarjeant's work has been published more than 180 times. He co-authored a book on high-power electronics, was a fellow of the Institute of Electrical and Electronics Engineers and a member of the American Society of Mechanical Engineers, among his many academic memberships.

Sarjeant was predeceased by his wife, the former Ann Richards. He is survived by a daughter, Cheryl; a son, Eric; a brother, Robert; and one granddaughter.

Kenneth M. Kiser, professor emeritus and associate dean in the School of Engineering and Applied Sciences, died Oct. 28 after a long illness. He was 84.

Kiser began his career at UB in 1964 as a professor of chemical engineering and served as associate dean for the engineering school from 1977 to 1995. He retired in 1998.

He was a member of the American Institute of Chemical Engineers, Sigma XI and the National Science Foundation Graduate Research Fellowship at Johns Hopkins University. He was a recipient of the SUNY Chancellor's Award and was honored with the Tau Beta Pi Teacher of the Year Award in 1973.

Born in Melvindale, Michigan, Kiser earned a BS from Lawrence Institute of Technology in 1951, MS from the University of Cincinnati in 1952 and a PhD from Johns Hopkins University in 1956, all in chemical engineering.

Prior to joining UB in 1964, he worked for General Electric in Schenectady from 1956 to 1964, and also served as an associate professor at Rensselaer Polytechnic Institute from 1962 to 1964.

Student's six-foot water and solar-powered lens purifies polluted water

Project featured on CBS's "Innovation Nation"

Water may appear to be an abundant resource, but in some parts of the world clean water is hard to come by.

That could change through the work of a team of undergraduate engineering students who researched how to improve a 6-foot-tall, self-sustaining magnifying glass.

Properly termed a water lens, the device uses another abundant resource—sunlight—to heat and disinfect polluted water. Since the frame for the lens can be constructed from commonly found materials—wood, plastic sheeting and water—the lens can be built for almost no cost, offering an inexpensive method to treat water.

The device can heat a liter of water to between 130 and 150 degrees Fahrenheit in a little more than an hour, destroying 99.9 percent of bacteria and pathogens.

"The water lens could have a huge impact in developing countries," said Deshawn Henry, a civil engineering major who performed the study under James Jensen, professor in the Department of Civil, Structural and Environmental Engineering. "Millions of people die every year from diseases and pathogens found in unclean water, and they can't help it because that's all they have."

The lens consists of a plastic sheet covered with water supported by a wooden frame. The frame holds a small container of water below the lens in line with a focal point created from a concentrated ray of sunlight. Barring the weather, once assembled, the lens functions freely.

The project was featured on CBS's "Innovation Nation," hosted by Mo Rocca and aired nationally on February 14, 2015. Both Jensen and Henry were interviewed for the show.

"It's been heartening to represent UB in such a positive way," said Jensen. "I hope these '15 minutes of fame' help shine a light on an important global health problem and the work done at UB to help others."

In addition to Henry, UB civil and environmental engineering undergraduate students Alexander Valencia and Matthew Falcone have contributed to the work.

» Marcene Robinson

Douglas Levere

Deshawn Henry (1) demonstrates the water lens. The team investigated the optimal thickness of the plastic sheeting (2) and water volume (3) to achieve the best efficiency of the lens, and used weights to adjust the tension of the plastic to shape the lens (4). The insulated pan holds the water that is being disinfected (5).

UB team to participate in NASA challenge

A team of talented UB students has been invited to participate in real life NASA research and development.

Under a new microgravity activity called Micro-g Neutral Buoyancy Experiment Design Teams (Micro-g NExT), UB was one of 19 undergraduate student teams from around the country that was selected to design and build technology to address and rectify authentic, current space exploration problems.

The UB team is building a "Quad Claw" device that could enable an astronaut to obtain float samples from an asteroid.

The team will travel to NASA's Johnson Space Center in Houston this summer, where they will test their device in the simulated microgravity environment of the Neutral Buoyancy Laboratory (NBL), the same 6.2-million-gallon indoor pool used to train astronauts for spacewalking.

Onion Studio, Inc.

UB's Micro-g NExT team: From left, Cornato Vella, Asad Esa, Ifechukwu Ononye, Seamus Lombardo (holding the "Quad Claw"), Michael Esswein, Alexander Hathaway and faculty advisor Manoranjan Majji.

The challenge is a part of NASA's "Path to Mars" plan to send astronauts to an asteroid in the mid-2020s, where part of their mission will be to gather samples from the asteroid for scientific analysis.

From left, against wall: Robert Tom, Dennis Elsenbeck, Russell Agrusa and John Pilitsis were among the 13 members of the Dean's Advisory Council who participated in a panel session on career perspectives.

GSA officers organize two-day career and networking event

SEAS Graduate Student Association (GSA) officers Matthias Schmid, Atif Afzal, Mark Tomaszewski and Pavan Behara took the lead in planning, coordinating and delivering the *First Annual SEAS GSA Conference on Career Perspectives and Networking*, held in April 2015. The two-day event featured career-related workshops, panel sessions, talent fair and graduate poster competition.

Also featured were keynote addresses by John Scannell, Chairman and CEO, Moog Inc.; Christopher Scolese, Director, NASA Goddard; and Michael Constantinou, SUNY Distinguished Professor, Department of Civil, Structural and Environmental Engineering; along with enthusiastic participation from the Dean's Advisory Council and SEAS departmental advisory boards.

Space Bulls shine at NASA-sponsored Mars rover contest

UB's Space Bulls placed third—their best finish yet—at the RASC-AL Exploration Robo-Ops Competition on June 4-5 at NASA's Johnson Space Center (JSC) in Houston.

Tomasz Pietruszka, Peter Casey and Livio Forte took this year's robot, Astraeus II, to Houston with faculty advisor Kevin Burke. The rest of the team gathered in Bonner Hall on UB's north campus, where they used game controllers, cameras and the Internet to guide the robot's movements through a series of obstacles in NASA's JSC Rockyard, a test area that simulates Mars.

Among the tasks the robot had to complete: climb a 30-degree slope, cross sand and gravel pits, and collect rock samples up to 8 centimeters.

This year was the fourth time in five years that organizers chose the Space Bulls. Faculty advisors are Kevin Burke, teaching assistant professor, and Jennifer Zirnheld, associate professor, both in the Department of Electrical Engineering. Also providing assistance is Karthik Dantu, assistant professor of computer science and engineering.

The Space Bulls team (in blue) with their seven competitors in the rockyard at NASA's Johnson Space Center in Houston.

Neeti Pokhriyal and Wen Dong

Pokhriyal wins National Statistics Prize in D4D challenge

Intrigued by an opportunity to use big data to further societal development, computer science and engineering student Neeti Pokhriyal entered the 2015 Data for Development (D4D) Senegal Challenge and won the National Statistics Prize. Pokhriyal used data on mobile phone usage and mobility to generate a virtual network, and correlated it with poverty indicators such as education, health, and living conditions. The resulting map will assist policymakers in developing anti-poverty programs for specific population groups in Senegal.

Pokhriyal's advisor is Wen Dong, assistant professor of computer science and engineering.

Prestigious Goldwater Scholarships awarded to three engineering students

Stephanie Kong, Sharon Lin and Kristina Monakhova were named Goldwater scholars, a nationally recognized honor that supports undergraduates studying science, mathematics or engineering.

The three are among 260 award winners chosen by the Barry Goldwater Scholarship and Excellence in Education Program from a nationwide pool of 1,206 sophomores and juniors. Congress established the program in 1986 to honor Barry Goldwater, a five-term senator from Arizona.

"The Goldwater scholarship committee could not have chosen three more deserving scholars than Stephanie, Sharon and Kristina," said Liesl Folks, dean of UB's School of Engineering and Applied Sciences. "The awards are especially gratifying because of the emphasis UB places on encouraging women, minorities and other underrepresented groups to pursue careers in STEM fields."

This year's award winners are a point of pride for the School of Engineering and Applied Sciences. Since 2012, six undergraduate engineering students—including five from the Department of Chemical and Biological Engineering—have won the prestigious award.

STEPHANIE KONG

Major:
Chemical engineering and Spanish

Hometown:
East Amherst, NY

Upon arriving at UB in the fall of 2013, Stephanie Kong sought to work in the laboratory of Paschalis Alexandridis in the Department of Chemical and Biological Engineering. She read through the faculty research bios and was particularly drawn to Alexandridis' work with surfactant self-assembly.

Fast forward to 2015, where she is now studying the fundamental thermodynamic properties of model surfactant systems, which Kong said "may be used to create more eco-friendly dispersants for oil spill cleanups, assess the stability of drug-delivery systems and other applications."

Kong intends to earn a PhD in chemical engineering, and plans to conduct research in nanomaterials and teach at the university level. She also hopes to promote scientific learning and outreach in low-income area schools.

"Stephanie is the most academically accomplished third-year UB student I've known. She is a dedicated and serious student, self-motivated and ambitious."

Paschalis Alexandridis, UB Distinguished Professor

SHARON LIN

Major:
Chemical engineering

Hometown:
Schenectady, NY

Sharon Lin was first exposed to medical research by her father, a cancer researcher and professor at Taipei Medical University in Taiwan.

At the end of her freshman year at UB, she joined the laboratory of Blaine Pfeifer in the Department of Chemical and Biological Engineering. Her research focuses on methods of gene delivery, the process of delivering therapeutic DNA into a cell.

"This kind of work is powerful because it can be used to treat many sorts of diseases at the genetic level, including various cancers," said Lin.

Lin plans to earn a PhD in chemical engineering, conduct research in pharmaceutics and polymer engineering, and teach at the university level.

"It has been a pleasure working with Sharon. Her scientific ability is truly outstanding. She represents the best of UB."

Blaine Pfeifer, Associate Professor

KRISTINA MONAKHOVA

Major:
Electrical engineering

Hometown:
Liverpool, NY

Kristina Monakhova was studying in France when she learned that she won the scholarship. The study abroad experience was just one of the interesting projects that she has tackled as a UB student. Among them:

- Participant in GLADOS, a U.S. Air Force-funded project designed to track space debris that orbits the Earth, threatening satellites and future space missions (see story on back cover).
- Part of a team that developed a radar system for unmanned aerial vehicles, funded by UB's Center for Undergraduate Research and Creative Activities.
- An internship with NASA's Robotics Academy at the Marshall Space Flight Center in Alabama.

Monakhova plans to earn a PhD in electrical engineering and research advanced concepts in space systems while leading a multidisciplinary space systems research laboratory.

"Kristina truly deserves this award. The depth and breadth of her research interests, combined with her ability to execute research and deliver presentations, all are exceptional."

John Crassidis, CUBRC Professor in Space Situational Awareness

Douglas Levere

Western New York's best and brightest

Emily Brooks, Prosperity Fellow and iSEED graduate scholar

Emily Brooks, a native of Buffalo, NY, is a PhD student in biomedical engineering and a recipient of a Prosperity Fellowship awarded annually by the Prentice Family Foundation to Western New York's "best and brightest students."

Brooks is currently a graduate assistant in the Kenneth A. Krackow M.D. Orthopaedic Research Laboratory at UB, where her mentor is Mark Ehrensberger, assistant professor of biomedical engineering.

Her research focuses on the electrochemical characterization of biomaterials for orthopaedic and sports medicine applications. The overall goal, she said, is to ensure that "the materials we use for prosthetic devices are long lasting and allow patients to do what they want without restriction on motion or activity level.

"Hopefully this will allow people to live an active lifestyle longer–something that I am passionate about," said Brooks.

Brooks, who plans to continue working on research and development of orthopaedic devices in her future career, was also awarded a fellowship through the Institute for Strategic Enhancement of Educational Diversity (iSEED) and is a member of the Collaborative Learning and Integrated Mentoring in the Biosciences (CLIMB) program, a professional development program for doctoral students in the sciences at UB.

Brooks could have gone elsewhere to pursue a doctorate in biomedical engineering, but she is convinced she made the right choice to stay at UB.

"It's a new program, but a lot of opportunities have come along with that," she said. "I'm happy I decided to stay at UB."

A dedicated athlete, Brooks was president and co-captain of the Women's Rugby Club while an undergraduate at UB. She continues involvement in student organizations as co-founder and treasurer of the Graduate Student Biomedical Engineering Organization. She is a member of both the National Association of Corrosion Engineers (NACE), and the Society for Biomaterials.

Outside of academia, Brooks enjoys coaching for the Girls on the Run Program, running and cycling.

NFL schedules could be fairer

The NFL is widely admired for its parity. But could it do a better job promoting fairness, especially when scheduling games? The answer, according to a new mathematical analysis by industrial and systems engineering PhD student Niraj Pandey and recent BS graduate Kyle Cunningham, is yes.

The two, along with faculty advisors Murat Kurt, assistant professor and Mark Karwan, Praxair Professor of Operations Research and SUNY Distinguished Teaching Professor, examined NFL schedules from recent years, and found a disparity among teams that played against opponents coming off a bye or Thursday game. They created a mathematical model called a mixed-integer linear program, and found, among other conclusions, that these disadvantages could be kept reasonably low.

The study, "Alleviating Competitive Imbalances in NFL Schedules: An Integer-Programming Approach," was presented at MIT's Sloan Sports Analytics Conference, held February 27-28, 2015 in Boston, Mass., where it was voted the fan favorite. The conference is the largest student-organized conference in the world, and is held every year to encourage the spread of analytics ideas in the sports industry.

The study's results were also widely reported in the national press, including ABC News, Fox News and CBS News in Boston and Dallas.

STUDENTS

Members of the Society of Women Engineers did science projects with young visitors to the Buffalo Museum of Science during Engineers Week 2015.

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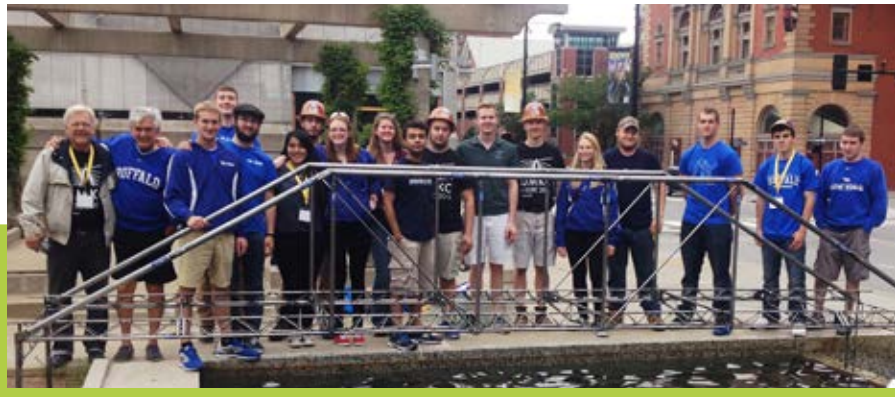
Don't make it fall! The IIE student chapter hosted a Giant Jenga game during Engineers Week 2015.

Students representing 16 engineering clubs and honor societies participated in Engineers Week 2015.

Engineers for a Sustainable World served up smoothies during the Student Club Expo and Engineering Alumni Night, held October 9, 2014, in Davis Hall.



The UB-ASCE steel bridge team took 4th place in the 2015 National Student Steel Bridge Competition, held May 22-23 in Kansas City. The team's deep truss design earned them their best finish yet.

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Mahmoud Ahmadi (left), and Samar Fawaz (right), chemical and biological engineering, and Alanna Olear (center) and Mohsen Ghaffari (not in photo), environmental engineering, won first prize at the NYS Pollution Prevention Institute (NYSP2I) R&D Student Competition. They developed a method to retrieve precious metal from waste effluent at Precious Plate Inc. in Niagara Falls, NY.

Laura Pavone won the 2014 Earthquake Engineering Research Institute's (EERI) Outstanding Undergraduate Student Paper Award. Pavone accepted the award at EERI's Annual Meeting, held March 31-April 3, 2015 in Boston. She worked under the supervision of Andreas Stavridis, assistant professor of civil engineering.

UB's SAE Baja entry placed in the top third at the 2015 Maryland Baja SAE Competition. The event was held at Budds Creek Motocross Park in Mechanicsville, Maryland in May 2015.

Electrical engineering PhD students George Sklivanitis (left) and Emrecan Demirors (fourth from left) won Nutaq's 2014 Software-Defined Radio Academic U.S. Contest. The team is guided by Professor Dimitris Pados (center) and includes fellow PhD students Adam Gannon and Ngwe Thawdar.

Anna Kelting, president of UB-ASCE's student chapter, accepts the 2015 ASCE Distinguished Chapter Award for Region 1. The award recognizes UB as the most outstanding student organization among the 48 student chapters in its region.

Casey Bunce, civil engineering student, is the man behind the cowbell at UB home basketball and football games, leading the Bulls faithful in the "Let's Go Bulls!" chant.

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The ASME student chapter took advantage of the snow to hold its inaugural cardboard sled challenge during Engineers Week 2015.

Chancellor's Award for Student Excellence winners Mackenzie Ward (left), computer science and mathematics, and Chams Mballo (right), mechanical engineering, get ready for commencement with Joel Hornbeck (center), electrical engineering. Hornbeck delivered the student address as winner of the first SEAS student speaker competition.

Distinguished SEAS alumni and friends honored with UB Alumni Association Achievement Awards

International Achievement Award: Alejandro Rivera Becerra

A distinguished diplomat for Mexico, Alejandro Rivera Becerra (PhD '01, MS '93, IE; ME '98, EnvE) became interested in environmental protection after seeing the serious pollution caused by manufacturing along the Mexico-U.S. border. Determined to use his education to help his home country, Rivera Becerra earned a master's degree in diplomatic relations and passed Foreign Service exams, then joined Mexico's Ministry of Foreign Affairs in 2003. He served as deputy consul general at his country's consulate in China, and as trade and cooperation officer at the Mexican embassy in Ecuador. Today, he directs environmental governance and is Mexico's chief negotiator at the United Nations on issues of climate change.

Read more about Rivera Becerra in the summer 2015 issue of *At Buffalo* magazine.

Walter P. Cooke Award: Stephanie Mucha

Stephanie Mucha received the Walter P. Cooke Award for her philanthropic contributions to UB. As a licensed practical nurse, she worked for more than four decades at the Buffalo Veterans Administration Hospital, where she witnessed UB alumnus and inventor Wilson Greatbatch (SEAS class of '57) demonstrate the first implantable pacemaker. Mucha and her husband later bought shares in Medtronic, the company licensed in 1961 to manufacture the device. By the time Mucha donated a portion of the shares in 2007, the investment had grown to $459,000.

One of her many gifts to UB is in honor of her late husband Joseph, a mechanic who dreamed of becoming an engineer. The scholarship will be given to deserving students in the Department of Mechanical and Aerospace Engineering.

Philip B. Wels Outstanding Service Award: Dean's Advisory Council

The Philip B. Wels Outstanding Service Award recognizes the countless hours that the Dean's Advisory Council (DAC) has devoted to the School of Engineering and Applied Sciences. The DAC's invaluable advice, leadership and financial support over the past two decades have helped the school achieve pre-eminence in a multitude of areas.

The DAC is recognized by UB as a model advisory group. With more than two dozen members, the group has led the engineering school through multiple transitions while helping to steer the success of numerous university events. The volunteer committee was initiated by former dean Mark Karwan in 1996.

Nancy J. Parisi

Engineering Dean's Advisory Council

In Memoriam

Venkat Panchapakesan

This year's recipient of the Clifford C. Furnas Memorial Award, Venkat Panchapakesan (MS '90) passed away on May 11, 2015 at the age of 48. Panchapakesan was head of engineering at YouTube and had recently joined the SEAS Dean's Advisory Council. He was a strong advocate of international alumni relations and was taking a leadership role in building an alumni network in the greater Bay area of Northern California, where he lived and worked. A holder of many Internet-related patents, Panchapakesan also served as vice president of engineering at Google, where he oversaw the technology behind applications like Gmail, Drive and Calendar.

Panchapakesan is survived by his wife, Sandy, and two children.

Ephrahim Garcia

Ephrahim Garcia (PhD '90, MS '88, BS '85), professor of mechanical and aerospace engineering at Cornell University and member of the SEAS Dean's Advisory Council, passed away on September 10, 2014. He was 51. Garcia headed Cornell's Laboratory for Intelligent Machine Systems, where he worked on projects ranging from modeling and analyses of flapping wings to energy harvesting for biological systems. He was named a National Science Foundation Presidential Faculty Fellow in 1993 by President Bill Clinton.

Garcia is survived by his wife, Anna Marie, his son, Isaac, and his daughter, Sarah.

Alumni in the News

Robert Kirkham/Buffalo News

ASi wins 43 North business plan competition

Adiabatic Solutions, LLC, also known as ASi, headed by UB engineering alumnus Glenn Thomas (BS ME '79) took first place in Buffalo's 43 North competition, earning the company a $1 million grand prize. The company, located in Tonawanda, NY, has also been approved for START-UP NY through its affiliation with UB.

Douglas Taylor and Taylor Devices inducted into Space Technology Hall of Fame

Taylor Devices and its President and CEO Douglas P. Taylor (BS ME '71) were inducted into the Space Technology Hall of Fame for their seismic damper technology. The dampers evolved from Taylor Devices products used on both the Apollo and the Space Shuttle programs. The technology is still in use today to protect equipment on the International Space Station.

Taylor received the award at the 31st Space Symposium, held in Boulder, Colorado.

SBIR Hall of Fame Recognizes Ultra-Scan and Founder, John Schneider

Ultra-Scan and its founder, John K. Schneider (PhD '90, MS '87 & BS '80, EE) were inducted into the Small Business Innovation Research (SBIR) Hall of Fame in Washington D.C. The award, bestowed by the U.S. Small Business Association, recognizes companies with a long period of extraordinary success of research, innovation, and commercialization within the SBIR program. Schneider received the award during a ceremony at The White House.

Founded in 1989, Ultra-Scan is an identity management solutions provider and a forerunner in the development of high-accuracy fingerprint identification technology. It was acquired by Qualcomm of San Diego in February 2013; the focus of the Buffalo office is a Biometric Center of Excellence.

Kolluri receives Dean's Award for Achievement

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Ann Bisantz, Kittu Kolluri and Rajan Batta

Krishna "Kittu" Kolluri (MS IE '88), general partner at New Enterprise Associates (NEA), received the 2015 Dean's Award for Achievement.

Since earning his master's degree, Kolluri has contributed his extensive technical and management abilities to positively impact numerous companies. He co-founded Healtheon, a dot-com startup that later merged with WebMD. Subsequently, he became president and CEO of Neoteris, a leader in the field of Internet access and security. The company was acquired first by NetScreen Technologies and then by Juniper Networks, where Kolluri served as executive vice president and general manager of its security products group.

Now as a general partner at New Enterprise Associates, Kolluri is on the forefront of venture capitalism and serves on numerous boards of NEA portfolio companies.

Kolluri has served on the Dean's Advisory Council and is a member of the Delta Society, the school's leadership annual giving society. He resides in the San Francisco Bay Area.

Kolluri credits his UB education for preparing him for a successful career. "Upon arriving at UB as an international student, I was incredibly nervous about what to expect. Almost immediately though, the school's faculty and fellow students took me in and really made UB a home away from home. I feel my time at UB truly set me up for future success," said Kolluri.

Scolese receives SUNY honorary degree

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UB President Satish Tripathi and Christopher Scolese

Christopher Scolese (BS '78), director of NASA's Goddard Space Flight Center and a Fellow of the American Institute of Aeronautics and Astronautics (AIAA), received an honorary doctorate of science from the State University of New York. The honor recognizes his significant and enduring contributions to space systems engineering and, more broadly, space exploration.

Scolese, a Buffalo native, joined NASA in 1987 and has served in numerous leadership roles, including manager of the Earth Orbiting Satellite Program, deputy director of flight programs and projects for earth science, and project manager of the Earth Observing System Terra Satellite Mission. Appointed acting administrator of NASA in 2009, Scolese earned the agency's highest honor—the Distinguished Service Medal—for his leadership in this role.

Scolese has remained meaningfully engaged with his alma mater, lecturing at UB and mentoring students.

Did you miss out? Update your info with us to ensure you're invited to the next Insider's Look or other events in your area! Send updates and ideas for future events to *EngineeringAlumni@buffalo.edu.*

1 E-week: After taking the Order of the Engineer, students learned networking and other soft skills from National Grid Regional Director Dennis Elsenbeck, '96 (left) and other alumni volunteers at "UB Schmoozin."

2 BUF: Larry Mathews '69 did some schmoozin' of his own at the third annual Buffalo All Alumni event in Larkinville. 2015's event will be held September 17 at the HarborCenter.

3 DC: Insider's Look at NASA Goddard with Goddard Director Chris Scolese '78. Volunteers and donors were treated to a tour of the Space Flight Center before a reception in the Rocket Garden with Scolese and other UB alumni from around the greater D.C. area.

4 & 5 UB: Awards night. 2014 Mentor of the Year Mike Hooven '92 poses with one of his many mentees, Kirk Ramirez, at our October award night; 2014 Student Supporter of the Year Professor Kevin Burke '97, '04, '10 beams in his UB tie with graduate student and Space Bulls team member Peter Casey, and Dean Liesl Folks.

6 SF BAY: The newly formed San Francisco "UBay" chapter of the UB alumni network held its inaugural meeting at the Mitchell Park Community Center in Palo Alto. Alumni bonded with each other and with UB's Vice President of Research Venu Govindaraju, '88, '92.

7 BUF: Alumni at one of our Insider's Look events at the HarborCenter project in Buffalo during its construction phase. Joe and Paula Pautler, both '97, showed their UB pride via their own hardhats!

8 Did you know there are UB alumni in leadership positions at all of NASA's Centers? One class of '15 grad was so excited about joining them that she donned this homemade commencement cap in May.

Engineering celebrations attract almost 250 students, alumni and faculty during Engineer's Week

Liesl Folks (center) and Richard Chang (to her right) show off their rings with electrical engineering seniors.

One of the school's long standing traditions is the Order of the Engineer and the Engineer of the Year award ceremony, which is held every year during Engineer's Week. This year's event included several special guests and a new networking event for students directly following the ceremony.

SEAS alumnus Richard Chang (MS '79), SEAS Dean Liesl Folks, and SEAS Associate Dean for Accreditation and Student Affairs Christine Human joined the approximately 250 students in attendance to be inducted into the Order of the Engineer. Led by SEAS Emeritus Professor Michael Ryan, the group repeated the Obligation of the Engineer, an oath similar to the Hippocratic Oath, and received a stainless steel ring to wear as a symbol of professionalism in engineering. Several members of the New York State Society of Professional Engineers also participated in the ceremony.

Chang, a distinguished alumnus with a 30+ year career in foundry operations, wafer fabrication, and semiconductor research and development, visited UB to attend the Order of the Engineer ceremony and to give a lecture to students in the Department of Electrical Engineering.

Landing a dream job

For as long as Mike Hotto (BS AE '13, MS AE '15) could remember, he always had a passion for aviation. His dream became reality following graduation, when he headed off to Tucson, Arizona to join Raytheon Missile Systems as a Systems Engineer II.

While at UB, Hotto was a frequent visitor at Career Services, where he often met with Holly Justice, the engineering-focused career counselor, to review his resume and practice interviewing skills. He also got first hand advice on how to conduct himself in an interview from Dean Liesl Folks, who advised him to "try to get them to tell you about themselves and what their jobs are like."

When asked what advice he would impart to others pursuing their career dreams, Hotto stated, "Do not hesitate to ask for help or feedback if things are not working out, and do not just sit back and wait. Finally, make time to get involved in clubs and activities on campus to supplement your academic work. Not only will this relieve stress, but it gives one the opportunity to learn real-world engineering outside the classroom."

>> Jenna Smith, UB Career Services

Mike Hotto, Raytheon Missile Systems

National Fuel Gas executive named 2015 Engineer of the Year

Ann Wegrzyn, National Fuel Gas

"Work hard, be a problem solver, and always take the ethical path," was the message delivered by this year's UB Engineer of the Year, Ann M. Wegrzyn.

A vice president at National Fuel Gas and longtime supporter of UB and the School of Engineering and Applied Sciences, Wegrzyn (BS IE '85, MBA '90) was recognized by the Engineering and Applied Sciences Alumni Association (EAA) for her volunteer work at UB and the community at large, with a focus on education.

"Ann's dedication to STEM education and outreach is an inspiration to other women in engineering," said Colleen O'Connell (BS CivE '03), President of the EAA.

Wegrzyn oversees information technology, engineering services and telecommunications at National Fuel Gas. She joined the company as an industrial engineer after graduation in 1985, and has since held a variety of positions in field construction, customer service and information technology.

She is currently responsible for information technology and cybersecurity, as well as engineering services, which supports pipeline design and maintenance activities for the Utility, Midstream and Gas Pipeline segments of the company.

She has served on the SEAS Dean's Advisory Council since 2007, and is a board member of the UB Alumni Association, where she serves on the Executive and Alumni Careers committees. In the past, she also served on the Engineering Alumni Association Board of Directors.

UB alumnus and Praxair Chief Technology Officer Todd Skare displays Praxair's Corporate Partner of the Year award, which he received from Liesl Folks, dean of the School of Engineering and Applied Sciences. Also representing Praxair are, from left, Jeffrey Goodband, Bill Scharmach, Russell Heater, Stefan Laux, Douglas Steyer, Martin Strade, Cindi Hoover, Stephan Gamard, Cem Celik, Frank Mufalli and Joe Couche.

Praxair fuels passion for partnership with SEAS

As this year's UB Engineering Corporate Partner of the Year, Praxair has generated more than 25 years of educational, research and career impact on hundreds of students and faculty across the SEAS departmental landscape.

The Praxair partnership is rooted in extensive alumni employment, internship opportunities, funding for graduate students, equipment donations to research laboratories, program sponsorships that promote women and minorities in engineering, and employees volunteering as mentors for students and serving as advisory board members.

For the past eight years, Mark Karwan, professor and former SEAS dean, has had a professorship funded by Praxair for his work in operations research, which also fully supports a PhD student yearly on projects directly impacting the company.

Karwan's work in Industrial and Systems Engineering (ISE) has helped Praxair improve its supply chain and applications in logistics and revenue management. "There's a great merger of their operations research talent and ours," said Karwan.

Praxair Research and Development Director Larry Megan is a longstanding research collaborator with Karwan, and a member of the ISE advisory board. "We do a lot of research work here and, of course, UB has the biggest pool of advanced engineering talent in the region. We want to be able to tap into that expertise," he said.

For more than 15 years, Praxair has funded an annual speaker series that brings in distinguished scholars and researchers from across North America to address topics in industry with faculty and graduate students nearly every week of each semester.

"Praxair is providing the opportunities for professionals to engage," noted Ann Bisantz, professor and ISE chair. "It's very important for our students to have engagement with industry."

Cynthia Hoover, Praxair's executive director of research and development, is chair of the Chemical and Biological Engineering (CBE) advisory board. "We help guide the initiatives of the department chair," she explained. "We were able to beef up his internship program to help more students get jobs." Hoover also serves on the Dean's Advisory Council.

The company has a history of participating in designated capstone plant design projects with CBE seniors. Over the past year, as a gold-level corporate partner, Praxair developed a senior design project of its own, working with students in the Department of Mechanical and Aerospace Engineering. The challenge was to develop a method to dense load granular material into a process vessel. "It's a real problem that we have in my research group," explained Hoover.

PRAXAIR
Making our planet more productive

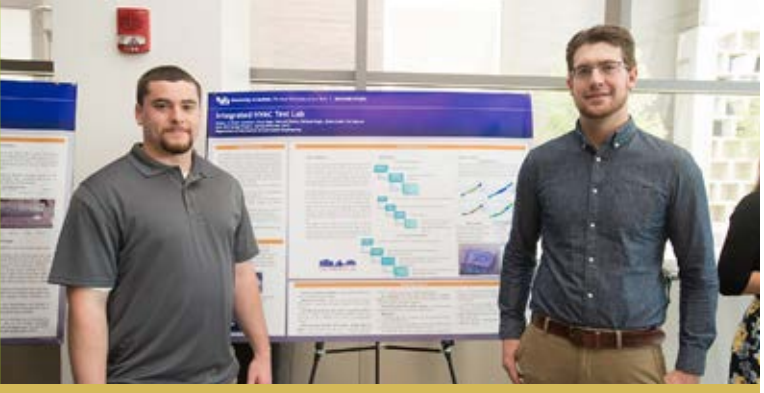
"A solution will have a direct impact on the operation of our air separation plants."

During a recent panel discussion event, five Praxair employees, all UB alumni, related opportunities UB students should pursue for success after graduation.

Younger students—particularly women—are also boosted by the company. In August, Praxair will host a portion of Tinker, a unique summer engineering camp for high school girls inaugurated by SEAS.

"We like to be a good community partner," said Hoover. "UB has a strong education program. Some of our best and brightest employees have come from UB."

» Jim Bisco



U&S Services sponsored a senior design project, one of the benefits available to Gold Level partners.

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Senior design team helps U&S Services design and build integration lab

A team of mechanical engineering seniors worked with engineering corporate partner U&S Services to help design and build a working controls integration lab for HVAC systems at its facilities. The students studied the layout of the lab, selection and procurement of hardware, and installation and testing of the equipment.

Students Quinn Adair, Yuri Marsan, Maxwell Reiser, Gregory Nagy and Micheal Regis participated in the project, and presented their results at the Senior Design Expo, held May 8, 2015, in Davis Hall.

U&S Services is a full-service building controls systems integrator serving Western New York and Northern Pennsylvania. The company is located in Tonawanda, NY.

30th Annual Scholarship Reception celebrates philanthropy and academic achievement

Onion Studio, Inc.

Leana DeSouza, recipient of the Felix Smist Memorial Scholarship, and donor Jim Smist.

Over 400 students, parents, family, friends, alumni, industry colleagues, and friends of the School of Engineering and Applied Sciences celebrated the achievements of this year's scholarship winners at the 30th Annual Scholarship Reception.

The memorable event, which is made possible by the School of Engineering and Applied Sciences' engineering corporate partners, featured guest speakers, food and drink.

Due to the ever-growing number of student scholars, the reception was held for the first time in the Bansal Atrium of Davis Hall. The new venue enabled many students to meet their benefactors.

The reception was held on May 1, 2015. A photo gallery and list of scholarships and recipients is on the school's website.

Onion Studio, Inc.

Richard Garman (front row, center) poses with some of the civil engineering student recipients of the scholarship that bears his name.

The engineering partnership program enabled three students to attend CivilCon '15 in Turkey. Tim Van Oss, Wil Nagengast and Zach Fisher pose in front of the North Tower of the Izmit Bay Bridge, located southeast of Istanbul. The event was hosted by the Istanbul Technical University civil engineering club. The student-run event includes a mix of presentations and cultural/technical tours, and gives students the opportunity to network with their peers from all over the world.

2014-2015 Engineering Partners

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To become an engineering partner, contact Todd Brooks, *toddbroo@buffalo.edu.*

Engineering students help GM Lockport plant solve problems

Pat Curtis has three words to describe a partnership that has immersed UB's engineering students at GM Components - Lockport Operations for the last five summers: a huge success.

As plant manager of the thermal products manufacturer for several years before departing in July to become plant manager of a Michigan GM facility, he witnessed the contributions of budding undergraduates. Each year, through UB TCIE's outreach and project management, an average of seven interns have worked on improvement opportunities, such as reducing scrap or increasing process streamlining.

"They help solve problems. Maybe that's oversimplifying it. But you know what? That's what we do here," Curtis said. "We solve problems so that we can get better. And the better we get, the more competitive we are."

Students provide a fresh set of eyes and new ideas. Different perspectives surface through daily work and during final presentations, when they are asked how they would do things differently. One suggestion, for example, spurred changes to an hourly employee training program.

"The capabilities of these students just floor me," Curtis said. "They're high tech. They're intelligent. They present themselves very well. It's very refreshing."

Some have impressed GM Components management enough to attract full-time job offers at the Lockport and Rochester plants.

Steven Denman (BS '13), now a quality engineer at the company, was introduced to the manufacturing workplace as one of the first program interns. He completed quality improvement and data collection projects to understand optimal tube measurements for a well-performing radiator. By summer's end, changes were enough to push quality measures from around 80 percent to 90 percent.

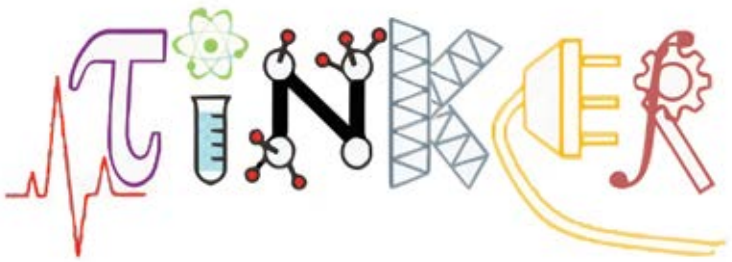
Denman said he researched and applied for a number of internships, but found this to be among the best.

"I liked it because it was a real engineering job. And after I was hired, I was basically doing the same thing as I was during the internship," he said, referencing the problem-solving nature of his responsibilities. "It threw me right in there. I wasn't sitting at a desk doing paperwork."

Another GM site has expressed interest in duplicating the success at Lockport by hosting interns through UB TCIE's coordination.

» Tracy Puckett

UB engineering students from the 2014 program pose with General Motors Components Holdings Lockport employees next to a Corvette, which was raffled to raise money for Hospice of Monroe, Erie and Niagara counties. From left: Pat Curtis, Royce Jacobs, Todd Hellert, Ashley Gurak, Jason Wagner, Timothy Leyh, Bryant Chen, John Bernardi, Chuck Gullo and Casey Shartrand.



Students team up to organize new summer camp

A new summer camp for high school girls debuted this summer. Called TINKER, the camp introduced students to the different disciplines of engineering through off-campus tours to local engineering companies, hands-on activities, and presentations by women in those fields.

The camp is led by three engineering undergraduate students, Katherine Czerniejewski, Julie Fetser and Dana Voll. Visit *engineering.buffalo.edu/tinker* for more information.

Graduate attributes job offer to Six Sigma program

When September 2014 UB graduate Amruta Nayak was job hunting, she applied for a process engineering position at a worldwide automotive interior components supplier, where she would have been stationed at one of the company's facilities.

Instead, the company, International Automotive Components (IAC), offered her a project engineer job at its North America Regional Headquarters in Michigan. Nayak credits her education in Lean Six Sigma "almost 100 percent" for garnering a more desirable position that involves regular travel and greater immersion into the corporate landscape.

Nayak participated in the 2013-14 Six Sigma Black Belt Student Certification Program, administered by UB TCIE and the industrial and systems engineering department.

Amruta Nayak

Students are placed at a company for two semesters, where they work to eliminate an identified process variation with the support of a UB Master Black Belt mentor.

Nayak praised the UB program for its content, the unique opportunity it affords young engineers, and the technical and emotional support provided by her mentor.

"I learned how to organize tasks and how to define the problem," she said. "It helped me understand time management and improved my communication skills. I'm more organized and more efficient in solving any problem."

» Tracy Puckett

Wearable tech for the battlefield and people at risk for heart attacks

Troops and civilians will get personalized health alerts via a wearable system created by UB and Sentient Science

The wearable system includes electrodes that relay data to a sensor, which connects with a remote computer network.

Wearable devices can count the steps you take and the calories you burn. But can they help soldiers in the field? Or prevent someone from having a heart attack?

Researchers at Sentient Science and the University at Buffalo say yes.

The sensor and software development company is working with Albert Titus, professor and chair of biomedical engineering, to create wearable technology that fuses real-time medical and physiological data with computer models. The system would then send personalized alerts indicating when the individual's level of stress, fatigue and resilience may put them in danger.

The work is funded by a grant from the Office of Naval Research's Small Business Technology Transfer program, which enlists small businesses and research institutions to develop technology with military and commercial applications.

"Whether carrying 100 pounds of gear up a mountain or avoiding makeshift bombs, today's soldiers face incredible physical and mental stress," said Titus. "Our wearable system aims to measure how the body reacts to those challenges and combine that information with algorithms designed to help keep soldiers as safe as possible."

The wireless system, which is under development, will feature a series of electrodes that measure heart rate, brain activity and other vital signs. The electrodes may be attached to the skin like a Band-Aid or sewn into clothing that hugs the skin; researchers are still deciding the best method.

The electrodes will relay information to a sensor (slightly smaller than a dime, attached to the skin like a patch), which will deliver that information to a remote computer network.

As the information enters the computer network, it will fuse with Sentient's DigitalClone Live software, which has been validated by NASA.

In addition to serving the armed forces, the technology has commercial applications as a health-monitoring device. Sentient is exploring how the sensor can be applied to everyday items, such as baseball caps. The individual wearing the cap would receive personalized health alerts regarding their risk of suffering a heart attack and other potential danger.

» Cory Nealon

Albert Titus is working with researchers at Sentient Science to create wearable technology for military and health care applications.

UB Science and Engineering Portal makes equipment and facilities available

The EQUIP portal aims to foster interdisciplinary research and boost the Western New York economy.

In a continuing effort to promote interdisciplinary research, and foster relationships with government and industry to grow the Western New York economy, UB is making some of the region's most advanced science and engineering equipment, and cutting edge research facilities, available for use.

The UB Science and Engineering Equipment and Instrumentation Portal (EQUIP) of Shared Facilities combines the resources of the School of Engineering and Applied Sciences, the College of Arts and Sciences, the School of Dental Medicine and UB's New York State Center of Excellence in Bioinformatics and Life Sciences (CBLS).

It features dozens of pieces of equipment housed in four facilities: the South Campus Instrument Center at Squire Hall, the Furnas Hall Materials Characterization Laboratory, the Davis Hall Electrical Engineering Cleanroom and the CBLS Multidisciplinary Cleanroom.

Collectively, the facilities offer a wide array of fabrication and characterization tools, knowledge and experience. Some of the equipment available includes scanning electron microscopes, e-beam evaporators, reactive ion etchers, ellipsometers, mask aligners and X-ray diffraction systems.

The two cleanrooms offer specialized equipment for micro and nanoscale device development and processing for applications in electronics, photonics and biomedicine and other industries. The materials characterization facilities feature instruments for liquid, powder, surface and bulk materials characterization, as well as expert analytical services for product quality assurance, failure analysis and forensic evaluation.

Equipment and lab use is charged at hourly rates. The facilities offer technical support and, in some cases, full service processing and analysis. For more information, visit: *http://www.buffalo.edu/shared-facilities-equip.html.*

» Cory Nealon

Companies receive UB technical assistance with help of grant money

Thanks in part to the Strategic Partnership for Industrial Resurgence (SPIR) grant, SR Instruments of Tonawanda, NY, is receiving assistance from a biomedical engineering graduate student in conducting research to support development of a new scale.

The SPIR grant helps companies in New York State fund engineering R&D projects, re-engineering business processes, facility layout and workflow analysis, access to shared instrumentation laboratories, and graduate student intern employment.

Shown from left are: John Phillips, engineering manager; student Elise Martin; Jerry Petrotto, OEM product development manager, and John Siegel, president.

Contact Gary Simon at (716) 645-8837 or *ggsimon@buffalo.edu* for more information.

Vader Systems rises in start-up ranks with UB assistance

Scott Vader and his son, Zachary, attended the 2013 New York World Maker Faire to show off their direct-to-metal 3D printer. Except there was one problem: they had no prototype to demonstrate that making low-cost, complex metal parts and products is achievable through additive manufacturing.

"There were quite a few high-level professionals and experts who said, 'You're trying to do what? Magnetohydrodynamics?'" said the elder Vader, recalling the reaction to a complicated liquid metal jet printing technology known as MHD. "There's no way that two guys in their basement could do that."

The East Amherst, NY, residents are proving naysayers wrong and have accumulated serious interest from manufacturers nationwide. Lockheed Martin is their first customer, and they recently acquired an initial group of investors

How have they gotten here? Start-up guidance, largely provided by UB, has a starring role.

It began with a phone call to UB TCIE, after the pair hit a snag with one of Zachary's ideas. Inability to find a resource to make their technology prompted a redirect. With the new goal of a 3D printer to suit their needs and serve any manufacturer requiring intricate internal structures, Vader Systems was born.

They developed a basic prototype of their high-tech MHD printhead, but it couldn't shoot a single droplet, much less create a part. Through UB TCIE, the Vaders are receiving technical assistance to solve some issues. Edward Furlani, professor in the departments of chemical and biological engineering and electrical engineering, and graduate engineering students are modeling and optimizing the dynamics of the droplet's flight and how they coalesce.

Scott credits UB TCIE for connecting them to other UB entities and leveraging "a lot of great things." They applied for and were awarded an entrepreneurship grant from National Grid with help from the New York State Center of Excellence in Bioinformatics and Life Sciences. Discussions with UB's Office of Economic Development led to being selected for Gov. Andrew Cuomo's tax incentive program START-UP NY.

And Vader is one step closer to a $1 million prize. The company is a semi-finalist in the 2015 43North business idea competition.

» Tracy Puckett

From left, father-son team Zachary and Scott Vader pose in their basement with their invention, a 3D printer that uses liquid metal jet printing.

Federal grant advances innovation and job creation

In August 2012, TCIE and a consortium of UB entities—the Office of Science, Technology Transfer and Economic Outreach, NYS Center of Excellence in Bioinformatics & Life Sciences, School of Management and NYS Center for Engineering Design and Industrial Innovation—were awarded a two-year EDA grant to foster innovation, job creation and private capital investment.

The UB consortium of units responsible for delivering iHub activities sought to expand its reach through broader endeavors. A partnership formed with Launch NY, a non-profit venture development organization serving 27 upstate New York counties, is strengthening connections between entrepreneurs, the business community and economic developers. These relationships are further enabling entrepreneurs to connect with UB's technologies and research commercialization services. The accompanying infographic depicts iHub's influence and impact.

For more information, contact Timothy Leyh at (716) 645-8844 or *tleyh@buffalo.edu.*

» Tracy Puckett

DELTA SOCIETY

We thank our donors for their support in fiscal year 2014-2015 (July 1 – June 30).

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We strive to ensure that gifts are listed accurately. If any information listed is incorrect, please call Todd Brooks in the School of Engineering & Applied Sciences' Office of Philanthropy and Alumni Engagement at **(716) 645-2133 or email *toddbroo@buffalo.edu.***

Gifts at work

Alums Scott and Coleen Stevens provide space for student collaboration

The fourth floor of Bonner Hall is undergoing a transformation this fall. A new space dedicated to undergraduates is being developed that will improve access to student support services and provide space for collaborative activities.

Funded in part by a generous gift from Scott (BS Civil Engineering '79) and Coleen (BS Physical Therapy '79) Stevens' the new space will provide undergraduates with a place to collaborate and call their own.

Named The Stevens Center, the space is not the first to bear Stevens' name in the School of Engineering and Applied Sciences. The area outside Barbara and Jack Davis Hall, furnished with picnic tables, is called the Stevens Courtyard, in honor of a gift that the couple made during the construction of the building.

They have also supported many other UB programs, including the ASCE student club, athletics, the libraries, and the School of Public Health and Health Professions.

Giving back is important to the Stevenses. Scott and Coleen consider their financial gifts to be an expression of their appreciation for the education they received while at UB.

Scott is a member of the SEAS Dean's Advisory Council (since 2005), a recipient of the school's Dean's Award for Engineering Achievement (2011) and the Engineering Alumni Association's Engineer of the Year award (2010).

Coleen and Scott Stevens

Tim Siderakis

Delta Society celebrates 20th anniversary

As you sit in "Grace Plaza" outside of our newest building, "Barbara and Jack Davis Hall," and look upon the students sitting in the "Stevens Courtyard" or inside in the "Bansal Atrium," you really begin to see how much philanthropy makes a difference to the school and university.

From named lab and classroom spaces, inside and outside student and community spaces, scholarship and fellowship funds, as well as student club and project support, and faculty enhancement funds, the impact philanthropy makes is seen every day and at every level throughout our school.

I first want to thank all the individuals, as well as corporate and foundation friends, who support our school. There are literally thousands of alumni, friends, faculty and staff who support us on an annual basis at all levels. Every gift enables us to enhance the educational experience of our students, beyond the level of funding we receive from the State.

This fall, we celebrated 20 years of our Delta Society by inviting all past and present members to UB to recognize their continued support to SEAS. These dedicated individuals and organizations have made an annual philanthropic contribution of $1,000, and in some cases, much more. These gifts create a positive delta in continuing academic excellence that is nationally and internationally recognized, all at an affordable cost.

Once again, thank you for your continued support. We need your help and appreciate it more than we can express!

Tim Siderakis Assistant Dean, Philanthropy and Alumni Relations

The best public universities have the strongest private support!

CLASS NOTES

1940s

John L. Kerner (BS Mechanical Engineering 1949), wrote to tell us that before he retired, he worked on designing the air conditioning for the Library of Congress and all the buildings at Colonial Williamsburg.

1970s

Greg Parnell (BS Aerospace Engineering 1970), a research professor of industrial engineering at the University of Arkansas, has been named director of the operations management graduate program within the Department of Industrial Engineering.

Yitzhak Mendelson (BS/MS Electrical and Computer Engineering 1975/1976) was promoted to full professor of biomedical engineering at Worcester Polytechnic Institute. He has been a member of the WPI faculty since 1983.

Kevin P. O'Brien (BS Civil Engineering 1977) was elected president of the New York County Highway Superintendents Association. O'Brien has served as Niagara County's commissioner of public works and highway superintendent since 2002.

Orbiting Mars

David Mitchell (BS Mechanical Engineering 1984) is NASA's lead project manager for the MAVEN mission, which recently made its way into orbit around Mars on September 21, 2014. MAVEN, short for the Mars Atmosphere and Volatile EvolutioN mission, will explore the Red Planet's upper atmosphere, ionosphere, and interactions with the sun and solar wind.

Find out more about MAVEN at: ***www.nasa.gov/mission_pages/maven/overview/index.html***

Sara Czaja (MS/ PhD Industrial Engineering 1977/1980) participated in a panel discussion of leading scientists as part of the Nobel Prize Ceremonies in Stockholm. The Panel addresses global challenges regarding an aging society. Czaja is currently a Leonard M. Miller Professor in the Department of Psychiatry and Behavioral Sciences and Scientific Director of the Center on Aging at the University of Miami Miller School of Medicine.

Dennis M. Kelleher, PE (BS Civil Engineering 1978) was named Engineer of the Year by the New York State Society of Professional Engineers, Inc. Kelleher has devoted his 35-year career to building and improving water supply and wastewater systems throughout Long Island.

Robert C. Girardi (BA Computer Science 1979) was named president and chief executive officer of SofTrek Corp., where he was vice president of product development and marketing for nine years. Girardi has over 30 years' experience in the technology industry and previously worked at IBM, where he was global brand leader for IBM's Global Services Division.

1980s

Stephen Hadjiyane, PE (BCEE/BS Chemical Engineering, 1984) received the New York Water Environment Association Long Island Chapter Achievement Award. He is a vice president responsible for managing water/wastewater projects at Gannett Fleming.

Randy Hubler (BS Electrical and Computer Engineering 1985) was named manager of Contract Performance for Parsons Brinckerhoff.

Kenneth L. Recke (BS Mechanical Engineering 1986) was elected to the Greater Nashua Habitat for Humanity board of directors. Recke is director of plant engineering for the UPS Northeast District.

Keith D. Goertz PE (BS Chemical and Biological Engineering 1986) was named Region 4 director of the New York State Department of Environmental Conservation. Goertz will oversee DEC activities in Albany, Columbia, Delaware, Greene, Montgomery, Otsego, Rensselaer, Schoharie and Schenectady counties, and manage a staff of more than 200 employees. Goertz resides in Schenectady, NY.

James J. Lafferty (BS Industrial Engineering 1987) was named director of the newly created Professional Services Group of W&H Systems, Inc., a full-service integrator of material handling systems. Lafferty has over 25 years of experience in the material handling industry in engineering, management and business development roles.

Joseph Ettipio (BS Electrical and Computer Engineering 1987) joined AMICRA Microtechnologies GmbH as sales manager for the U.S. Western Region. Ettipio will be responsible for the company's portfolio of die bonder and flip-chip bonder systems, wafer inking systems, dispense and test systems, and other advanced technology solutions and services. He was previously with General Dynamics in San Diego, California.

Ashutosh Sharma (PhD Chemical Engineering 1988) was appointed secretary of India's Department of Science & Technology (DST). He is the Institute Chair Professor & C.V. Seshadri Chair Professor at the Indian Institute of Technology, Kanpur, and is also Coordinator, DST Unit on Nanoscience & Center for Environmental Science and Engineering at the Institute.

Kimberly M. Ajavananda (BS Mechanical Engineering 1989) was recently elected chairperson of the Board of Education in Redding, Connecticut.

James Mayrose (BS/MS/PhD Mechanical Engineering 1989/1993/2000) has been named dean of the School of Professions at SUNY Buffalo State. He is also chief executive officer of Tactus Technologies Inc., a maker of virtual reality products for the education and industrial training fields.

1990s

Luciano Castillo (BS/PhD Mechanical Engineering 1990/1997) was named a Fellow of ASME. Castillo is the Don-Kay-Clay Cash Distinguished Engineering Chair in Wind Energy, and the executive director and president of the National Wind Resource Center at Texas Tech University.

Franciscus A. Ladejola-Diaba (BS Mechanical Engineering 1994) was appointed chief executive officer and chairman of the Board of Directors at Endeavor IP, Inc., an intellectual property services and patent licensing company.

Jeffrey Austin White (BS/MS Aerospace Engineering 1994/1996) was appointed director of innovation at Lansing, Michigan-based Accident Fund Holdings Inc.

Harry S. Gombachika (MS Electrical Engineering 1996) was appointed chief executive officer of Malawi Telecommunications Limited (MTL). Gombachika held the position of general manager responsible for telecommunications at the Press Corporations Limited's corporate office, which oversees the mobile firm TNM and MTL.

Pulitzer Prize Winner

Marcus Yam (BS Aerospace Engineering, 2007) was among the staff of the Seattle Times to win a 2015 Pulitzer Prize in the category of breaking news coverage. Yam was the only photographer on duty when reports of the devastating landslide in Oso, Washington surfaced on the morning of March 22, 2014. Yam now works at the Los Angeles Times.

To see photos of his work, visit: ***www.marcusyam.com***

Members of the class of 1955 celebrated their 60th anniversary commencement weekend. The group has been meeting every July since 1995. Shown from left are: Ralph Quance, Bob Garbacz, John McClive, Ralph Johnson, Gerald Conroy, Dan Clark and Carl Albert.

Basil Helmi Badawiyeh (BS Electrical Engineering 1997) was appointed senior director of video products at Charter Communications.

Keila Peña (BS/ME Industrial Engineering 1997/1998), a business performance director with Xerox Corporation's Large Enterprise Operations, was featured as a "Woman to Watch" by the Rochester Democrat & Chronicle. She chairs the Xerox Hispanic College Liaison Program, which provides scholarships and grants to Hispanics with engineering and technical majors.

Sissy Nikolaou (PhD Civil Engineering 1998) was featured in the fall 2014 issue of SWE, the magazine of the Society of Women Engineers. The article, entitled "Building a Firm Foundation," was also highlighted on the National Academy of Engineering's Frontiers of Engineering website.

2000s

Valerie Beecher (BS/MS Industrial Engineering 2000/2002) is a member of the Zero Lift Task Force that is defining strategies for safe patient handling. Beecher is an ergonomics specialist at SUNY Upstate Medical Center.

Sririam Vilayanoor (MS Industrial Engineering 2002) learned that his company, Ignition Life Solutions, was approved to participate in START-UP-NY. The company is developing voice-recognition software for doctors and insurers.

Stephen Thomas (BS Chemical and Biological Engineering 2006) was named the new defensive quality control coach for the Philadelphia Eagles.

Roman Yampolskiy (PhD Computer Science 2008) joined the Institute for Ethics and Emerging Technologies (IEET) as an affiliate scholar. He is an associate professor in the department of computer engineering and computer science at the Speed School of Engineering, University of Louisville.

2010s

Gary M. Pritchard Jr. (BS Chemical and Biological Engineering 2006) earned his PE license.

Erin M. Jacklin (BS Electrical Engineering 2011) has a new job as an electrical engineer at The Johns Hopkins University Applied Physics Laboratory.

Richard Banks (MS Mechanical Engineering 2011) received a "Silver Snoopy" award, which recognizes employees of NASA and contractors for contributions to the human spaceflight program. Banks is a design engineer at Cobham Mission Systems in Orchard Park, NY. He was recognized for spotting a potential problem with a valve that led to a design improvement. Astronaut Michael J. Foreman, who flew on two space shuttle missions, presented Banks with the award.

Katie T. McConky (PhD Industrial Engineering 2013) joined the Rochester Institute of Technology as an assistant professor in the Department of Industrial and Systems Engineering. Prior to joining RIT, she worked as a research scientist for CUBRC Inc.

Olga Carcamo (BS Chemical and Biological Engineering 2014) completed her first year teaching chemistry and robotics in New York City as part of the Teach for America program. A story she wrote on teaching robotics was featured as a top story on the Teach for America website, and one of her students was so inspired that she applied to UB and was accepted into the environmental engineering program.

Benjamin S. Shaw (BS Mechanical Engineering 2014) joined Broetje Automation as a sales engineer.

Andrew Couche (BS Civil Engineering 2015) was named a junior engineer at Foit-Albert Associates in Buffalo, NY.

Obituaries

Nicholas Economou (BS Mechanical Engineering 1968) died December 15, 2014 at the age of 84. Economou worked at Bell Aerospace Textron for 38 years.

Patricia Doeing, a longtime staff person in the School of Engineering and Applied Sciences, died Dec. 18, 2014. Doeing worked at UB for 30 years before her retirement in 2000.

John Jondle (MS Electrical and Computer Engineering 1969) died on December 23, 2014. Jondle worked at Calspan Corp. and was a member of the UB Engineering Alumni Association Board of Directors. He was 85.

Right: Architecture and engineering students have joined forces to create the GRoW home, UB's first entry into the prestigious Solar Decathlon competition.


Zhi Ting Phua

March 8, 2015:
Framing begins.


Zhi Ting Phua

March 27, 2015:
Putting up green walls.


Ryan Lim

July 29, 2015:
Moving the house outside.


Ryan Lim

August 2, 2015:
Installing the canopy.

GRoW team students are gaining hands-on experience in construction, design and interdisciplinary teamwork, all skills that will help them succeed in future careers.

Visit ***grow.buffalo.edu/*** to learn more.


Zhi Ting Phua

Photo By Zhi Ting Phua

Help UB's GRoW home get to California

First entry in prestigious Solar Decathlon challenge lets students apply knowledge to real-world project

Buzzing with activity, a Montante Solar warehouse in Tonawanda, N.Y., is filled with UB students and faculty who have worked for two and a half years to design and build the GRoW home, UB's first entry in the prestigious U.S. Department of Energy Solar Decathlon.

UB is one of 20 teams accepted in the international competition—to be held October 8-18, 2015, in Irvine, California—which aims to educate the public about energy-saving residential designs. The name GRoW, an acronym for Garden, Relax or Work, is a nod to the many uses for the home, which embraces both the urban gardening culture of Buffalo and its four-season climate.

A multidisciplinary team of students and faculty has joined forces to design and build the GRoW home under the supervision of Martha Bohm, assistant professor of architecture and lead faculty advisor of the project. Students at every academic level, from freshmen to PhD, are involved in this collaborative process.

Sectional perspective drawing of the house.

The scope is huge. The house, once built and rigorously tested to measure the energy it uses and produces, will be deconstructed and transported to Orange County Great Park in Irvine. There, it will be evaluated in 10 contests, ranging from architecture and engineering to home appliance performance.

Following the competition, the GRoW home is expected to return to Buffalo and become an energy education center for the community.

So far, more than 300 individuals and over 55 organizations have made gifts to the project. Materials, services and cash have been donated from corporate partners, and the U.S. Department of Energy supplied seed funding. But, more funds are now needed to help transport the house to California and back to Buffalo.

Help our students grow and win one for Buffalo! Visit ***www.giving.buffalo.edu/grow*** and make your contribution today.

» Jane Stoyle Welch

I'm thankful.

Ronita Bose remembers walking with her schoolmates by a new bridge that her father, a mechanical engineer, had helped design. "I would say, 'Look, my dad helped build this!'" Ronita, who chose to attend UB because of its hands-on engineering curriculum, said the scholarship she received also made Buffalo her top choice. She considers herself very fortunate "to have UB's support in my quest for a world-class education." She looks forward to a career pursuing integrated system design: "I can use my knowledge of machines and electrical systems to plan and construct complicated mechatronics systems. This could range from electric vehicles to autonomous robotics—a pretty broad spectrum!"

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Douglas Levere

Shown holding GLADOS are: Mara Boardman (chief engineer), Andrew Dianetti and Saburo Okazaki. Back row: Megan Cheney, Kristina Monakhova, Ifem Ononye, Colin Trinh, Brian Bezanson, Andrew Harris (project manager), Adonis Pimienta-Peñalver, and Samuel Pawlyk.

NANOSAT TEAM BUILDS SPACE JUNK OBSERVATION SATELLITES FOR AIR FORCE AND NASA

UB's Nanosat team members had something to celebrate this spring when they learned that they received a competitive $110,000 grant to continue the development of GLADOS (Glint Analyzing Data Observation Satellite) from the Air Force sponsored University Nanosatellite Program (UNP-8).

The go-ahead comes after NASA selected UB to build a space junk tracking satellite for CubeSat in 2013. UB anticipates the Air Force will launch GLADOS in 2017, and NASA is expected to follow in 2018.

Over 60 students have participated in the project so far, under the guidance of faculty advisor John Crassidis, CUBRC Professor of Space Situational Awareness. Moog Inc. has also provided engineering and testing guidance to the students.