

# cable

The Alumni Magazine  
of Polytechnic Institute of  
New York University  
Spring 2013 Vol. 40 No. 11



**PLUS:**  
**A NOVEL APPROACH TO BREAST CANCER DETECTION**  
**and A BLOOD-STAUNCHING GEL**  
**THAT COULD TRANSFORM**  
**TRAUMA CARE**

**NYU:poly**

POLYTECHNIC INSTITUTE OF NEW YORK UNIVERSITY



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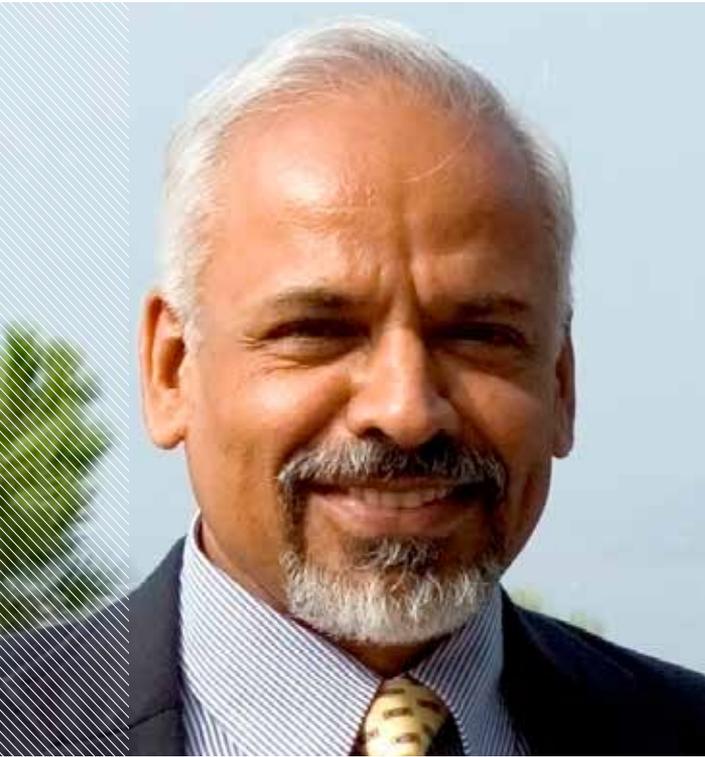


**On the Cover:**

Engineers are a major force in modern medicine, and our Spring issue illustrates some of the reasons.

**On the Web:**

Access the spring 2013 digital issue of Cable at [cable.poly.edu](http://cable.poly.edu)!



was appointed President of NYU-Poly very recently and want to take advantage of this opportunity to pass on a few thoughts.

Imagine a school that produces a third of the engineers in New York City. Imagine that some 45 percent of them come from disadvantaged families and that many of them are the first in their entire family to go to college. Imagine that, year after year, these students graduate with an earning potential that ranks among the top ten four-year schools in the country. Imagine that the school combines this educational mission with high-class research in a few well-chosen areas. That school is NYU-Poly.

Now, imagine a merger between this school and a great research university with extraordinary capacity in the social sciences, business, med-

icine, law, mathematics and sciences and other fields of human endeavor. Imagine now the incredible landscape that the combined institution will provide for students and faculty alike. Imagine how much more the combined institution can influence the City, the country and the world.

On January 1, 2014, if all goes according to plan, the merger between Poly and NYU will be official. We are at the beginning of a new phase in our history, and new opportunities are opening before us. As president, I will work with unsparing commitment to establish new relationships and collaborations with NYU and its global partners.

There will be challenges. While educating the next generation of inventors, innovators and entrepreneurs will always be our central objective, we must focus, as well, on being a great research institution.

To that end, we have identified three broad research themes that cut across departments and build upon our strengths: urban engineering, bioengineering and information and communications engineering. Our goal is to build world-class research centers in each of these areas. Our faculty is doing superlative work in those areas and our presence in other sectors—including clean energy and materials—is quite impressive.

I want to leave you, our dear Alumni, with an important message. Poly has undergone many changes already in one lifetime: from Polytechnic Institute of Brooklyn—or Brooklyn Poly—to Polytechnic Institute of New York, to Polytechnic University, to Polytechnic Institute of New York University. In 2014, it will become the Polytechnic School of Engineering of New York University. But it has always kept its name Polytechnic and its Brooklyn roots. And the name Poly is not the only thing that has remained intact. Its basic mission has not changed much either. The institution is still devoted to the idea of innovation in technology; it is still dedicated to the idea of providing opportunities for disadvantaged students; it is still committed to being special in combining excellence and diversity. About this continuity you should feel completely reassured.

An institution is not simply made up of buildings and real estate, and name. It is more the people. It is not just the people who are the current occupants

of the buildings either, but it is also the people who hold a common set of values. You, Poly's alumni, are part of this common heritage. I urge you to feel close to Poly in its new journey, which is simply a more energetic journey under a different banner.

Let's focus on the new opportunities that the merger with NYU brings. It provides a larger array of possibilities for both the faculty and students. For instance, if a student wants to double major in Mechanical Engineering and Music, it should be more easily possible. If a student wants to work on the technology of imaging the brain by joining forces with the Medical School, it will be equally possible. Our faculty members have already begun collaborations with the NYU faculty on many fronts, and I foresee potential explosion in this direction.

There is exciting work going on here—too much to describe in a single letter or even in a single issue of *Cable*. Come see us when you are in Brooklyn or visit us on the Web at [www.poly.edu](http://www.poly.edu) to learn more. Working together we can ensure that Poly flourishes as a model of diversity and excellence: there is no substance without excellence and no soul without diversity. We need your energy and your support.

Until we meet again, on campus or in the pages of your alumni magazine, my very best wishes for your continued happiness and success. We take pride in your accomplishments and hope that you consider your affiliation with Poly a source of pride as well.

K. R. Sreenivasan

Katepalli Sreenivasan



In this issue of *Cable*, I have the pleasure of welcoming Dr. Katepalli R. Sreenivasan as the 11th President of Polytechnic. Having completed my tour of duty as President, I will become a Senior Presidential Fellow of NYU and also continue to serve as a Professor of Management at Polytechnic. I hope you join with me in extending our warmest congratulations to Katepalli R. Sreenivasan, who has served so capably as provost and acting president. Sreeni, as we all know him, will not only be the President of NYU-Poly but also the Dean of Engineering at NYU, and I look forward to continued growth and excellence in the coming years with Sreeni at the helm.

In my new role, as Senior Presidential Fellow of New York University, I will focus, first, on innovation and economic growth and, second, on education using technology.

As to the latter, I am certain that as faculty members around

the world increase the use of innovative new technology (and breakthroughs in learning science) to improve education, we will see not only gains in the quality of education, but a more affordable means of delivering education to a broader cross-section of the world's young people. Without such change, education will become unaffordable to most young people, and that would end education's role as the source of opportunity and advancement for future generations.

As to innovation, not only has it been the core quality upon which we have transformed Polytechnic, but without a new burst of scientific and technological innovation in the next 30 years, it is hard to see how we can sustain, let alone improve the quality of life for the eight to nine billion humans who will live on the globe in 2050.

The good news is that invention, innovation and entrepreneurship are now evident in everything we do at Polytechnic. From our annual Inno/Vention

competition to our highly successful business incubators in Manhattan and Brooklyn to the newly launched Greenhouse space at 6 MetroTech Center—the spirit of i<sup>2</sup>e is palpable here. You may have heard about a competition run by Stanford University to find the 100 finest young entrepreneurs in the country. This year, not one, but six of those who made the cut are affiliated with NYU-Poly. When we talked to those young people, they all attributed their success to the fact that Poly had imbued them with the belief that their ideas could change the world—and provided them with the practical know-how to bring those ideas to fruition.

So, I am sure you can see why our faculty, students, administrators, staff and Board of Trustees are so proud of what Polytechnic has accomplished over the past eight years and why we

are so excited by our future as the Polytechnic School of Engineering of New York University. I hope that you are all equally proud to call this incredibly dynamic enterprise your alma mater.

As thrilled as we are about the accomplishments of our faculty and students, we are equally excited to hear about the marvelous things you, our alumni, are doing across America and around the world. You are an important part—indeed numbering more than 33,000, you are the largest part—of the NYU-Poly family, so please keep in touch, support our students, and stay involved. Although I have handed the keys of the Institute to someone new, I plan to continue reading *Cable*, and I know I'll be hearing terrific things about all that you are doing to make this a better world.

Jerry M. Hultin

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*Buddy Ratner, NYU-Poly alum (PhD '86CM) and director of the University of Washington's Engineered Biomaterials (UWEB), may have defied his parents' wish that he attend medical school, but he has nonetheless contributed to several medical breakthroughs and is widely considered a pioneer in the area of biomaterials. To open our spring 2013 issue of Cable focusing on the intersection of engineering and medicine, Ratner shared his thoughts on the amazing healthcare advances that have been made in recent years and the discoveries yet to come.*

**M**y parents always wanted me to be a doctor, but I lack the patience—and the patient skills—for that. But after studying at Poly, I found a way to apply my love of chemistry and engineering to the field of medicine, and I'm really proud of the contributions I've made.

I remember back in 1967, when I first began studying for my PhD, contact lenses were made from a hard material, basically the same that was used for window glazing. Herbert Morawetz, a Poly professor who is now retired, came back from a trip to his native Czechoslovakia talking about the invention of a remarkable new material called a hydrogel, which made possible the manufacture of soft contacts. It struck me: using the skills of a polymer chemist and engineer, one could envision and design a material that would meet a medical need.

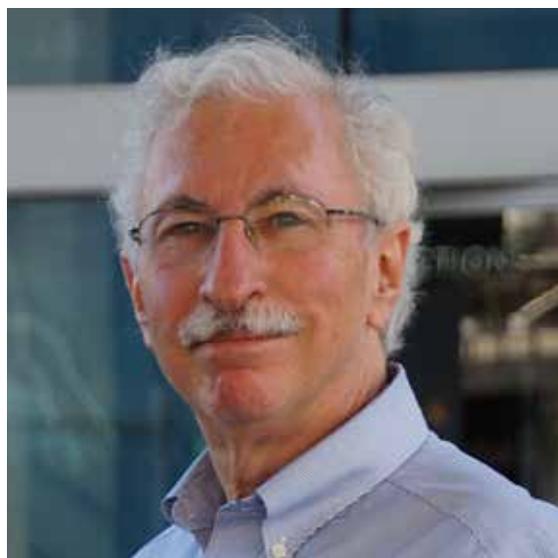
Today we hear all the time about biomaterials being

used to improve the quality of life for millions of people. Think of the prosthetics used in hip replacements; they've saved countless people from being confined to wheelchairs. The lenses used in cataract surgery, heart valves... the list goes on. From the top of your head to the tips of your toes, engineers and chemists have helped make huge breakthroughs.

It goes even further. Consider the DNA sequencing that has allowed us to map the human genome—impossible without engineering. Medical imaging like X-rays and CAT scans—likewise. Pacemakers with high-tech processors that communicate with your doctors—engineering again. Targeted drug delivery—thank an engineer for that, too.

The future is going to hold even more revolutionary developments. Prosthetic limbs are going to be able to move with the power of thought, thanks to sophisticated brain-device interfaces. Tissue engineering—using polymeric biodegradable scaffolds—is becoming a reality.

In every one of these cases, an engineer has been instrumental. I believe that some of the best, most innovative doctors are those who study bioengineering before going to medical school. That's an unbeatable combination, and luckily, I think we're going to see more of that in the future.



# CUTTING THE CORD

**NYU WIRELESS** and the  
hospital of the future

It started with what a couple of anesthesiologists came to call **Malignant Spaghetti**: the mess of wires, monitors and cords necessary for an operating room to function—but which also make the **OR awkward, even dangerous.**

So they wondered: **Could we replace this jumble and go wireless?**

That thinking led to a workshop—“Malignant Spaghetti”—at the Polytechnic Institute of New York University in November of 2008, which delved into the problems and promise of the wireless hospital.

**And this, in turn, was part of the inspiration** for, and mission of, NYU WIRELESS (nyuwireless.com), the world’s first academic research center that develops wireless communication engineering, computer science and medical applications.

NYU WIRELESS brings together faculty and students to research many areas of medicine, along with millimeter wave wireless communications and circuits, distributed networking and computing. Launched in the latter part of 2012, the

center has already had 25 faculty and 100 graduate and undergraduate students from NYU-Poly’s Electrical and Computer Engineering (ECE) and Computer Science and Engineering (CSE) departments, NYU’s Courant Institute of Mathematical Science

and the NYU Langone School of Medicine come onboard. Among the industry affiliates who have signed on are InterDigital, National Instruments, and Samsung. The center recently moved into 13,500 square feet of “the largest and most well-equipped academic wireless research center in the world,” at 2 MetroTech Center on the ninth floor, says NYU WIRELESS founder Theodore (Ted) S. Rappaport. A faculty member of NYU-Poly, Courant and the NYU School of Medicine, Rappaport previously founded academic wireless centers at Virginia Tech and the University of Texas at Austin, as well as two cellular technology companies that were sold to large public firms, and was recently named a 2013 Distinguished Engineering Alumnus of Purdue University.

“NYU WIRELESS is a completely new kind of research center at Poly,” he says, “because it brings together so many different talents across the entire campus. We are focusing on developing very deep and sustained relations with our industrial affiliate companies in the high-tech industry, in a stronger and more committed way than Poly has ever done before.”

NYU WIRELESS will not be focusing solely on medical applications. Also in the works, for instance, is a 5G cellular network, which will be a thousand times faster than what’s available to handheld smartphones these days. But Rappaport is especially excited that “the medical community is so positive and eager to work with Poly engineers. One thing technology can do is break down the barriers and bring about new solutions across the medical industry.” He had a hand in developing the first wireless pacemaker in the mid-1990s: “Ever since, I’ve been fascinated with the use of wireless to help solve medical problems.”

## Many Challenges

All that faculty and technical firepower will be needed to solve a host of problems that come with unwiring a hospital. One issue is the lack of standardization among manufacturers of major medical equipment. “That’s different from cellphones, which are sold



**1.** Anesthesia workstations typically require a formidable array of wires and cables, an anxiety-producing sight for some patients.

**2.** Tripping hazards are ubiquitous in the OR.



**3.** Data could be transmitted to a central network and archived wirelessly.

**4.** Overhead wires can pose a danger to OR personnel.

**5.** Patients could be monitored even after their release using wireless devices.

**6.** Fewer wires attached to a patient would allow better access in case the need arises for emergency defibrillation or other such procedures.

**7.** Massive disparate non-standard data could be avoided with wireless.

“The new center is bigger than any one professor or campus. It’s a **melting pot of great talents** to solve ideas.”

in millions of units versus a few very high-priced medical machines,” Rappaport points out. “One of our long-term goals is to standardize major equipment through wireless, and bring solutions from the communications and electronics industries into the operating room. The faculty at NYU WIRELESS are highly motivated by that big-vision mission.”

“Specialized hardware needs to be reliable and it is susceptible to interference that in a medical setting might be unacceptable,” adds Shivendra Panwar, Professor of Electrical and Computer Engineering and Director of the Center for Advanced Technology in Telecommunications (CATT), a center that is a part of NYU WIRELESS.

There can be security concerns too, according to Justin Cappos, Assistant Professor of Computer Science and Engineering and NYU WIRELESS faculty member, who researches systems security. “One basic of wireless is it’s a broadcast medium. Anyone can talk and anyone can listen. You have to appropriately use encryption so information is correctly hidden. That’s complicated when it comes to medical records that you want a lot of people to access, while keeping others out,” he says. “Five years ago I would have said we’d have electronic medical records by now or they’d be significantly gaining in popularity. But regulatory issues have an impact, and we can’t say how the business or legal side will tie in with technology.”

## Projects and Potential

NYU-Poly engineers don’t expect to solve all of this overnight, but they are making inroads in many areas. With radiologists at the NYU School of Medicine, they are bringing to radiology modern signal pro-

cessing and hardware, such as multicore microprocessors that get better images with better resolution than ever before. A collaboration between students in the radiology department and WIRELESS faculty is looking at measuring radiation emissions. “It’s a completely new way to use

MRIs to test cellphone emissions,” says Rappaport. And they are working with anesthesiologists, cardiologists and radiologists who need real-time wireless technology that can provide information to surgeons so they can make better decisions on the fly. They are also looking at using microwave radiation to help heart surgeons do cleaner, more controlled submillimeter tissue burn. “It promises to be better than today’s electronic scalpel,” Rappaport says. Yet another project, based on research by Jonathan Viveni, a faculty member of NYU WIRELESS, is developing new human-ready circuitry



that can be placed in the body, to send data without being tethered to cords. Rappaport sees potential for use in people with epilepsy, for one example.

A simple possibility, says Panwar, is that patients who need a sequence of tests could be given a wristband that tracks their samples, EEG and so on, so the facility knows that the patient has gotten all the tests done.

"There's a great opportunity to use a cellphone to improve personal health-care monitoring and delivery," says Rappaport. "Cellphones can be tied in to prescriptions, medications and doctor instructions. This

would be a great added value without a lot of overhead." Gbenga Ogedegbe, M.D., a member of the WIRELESS faculty, is leading some early trials.

## Looking Ahead

"I believe the wireless hospital will have to take off because of the pressure to reduce costs: Technology will be used to reduce costs of healthcare," says Panwar. "Up till now, it's been littered with failure, but at

some time someone will come along with the right mix of luck, talent and money. It's almost inevitable: better health records, better billing, life-saving techniques. There are huge opportunities for cost savings and better care based on better use of technology."

NYU WIRELESS is likely to play a major role. "The new center is bigger than any one professor or campus," says Rappaport. "It's a melting pot of great talents to solve ideas. Our engineering and other students will become very knowledgeable thought leaders and will implement the future of the tech world." ◉



# A NEW BIOENGINEERING BUILDING

Medical research in New York City will continue its preeminence thanks in part to a new healthcare education and research facility on Manhattan's eastside Health Corridor. Construction is just under way at 433 First Avenue on an 11-story building that will include a research facility for NYU-Poly, as part of NYU's Bioengineering Institute, along with teaching and research space for the NYU Colleges of Nursing and Dentistry.

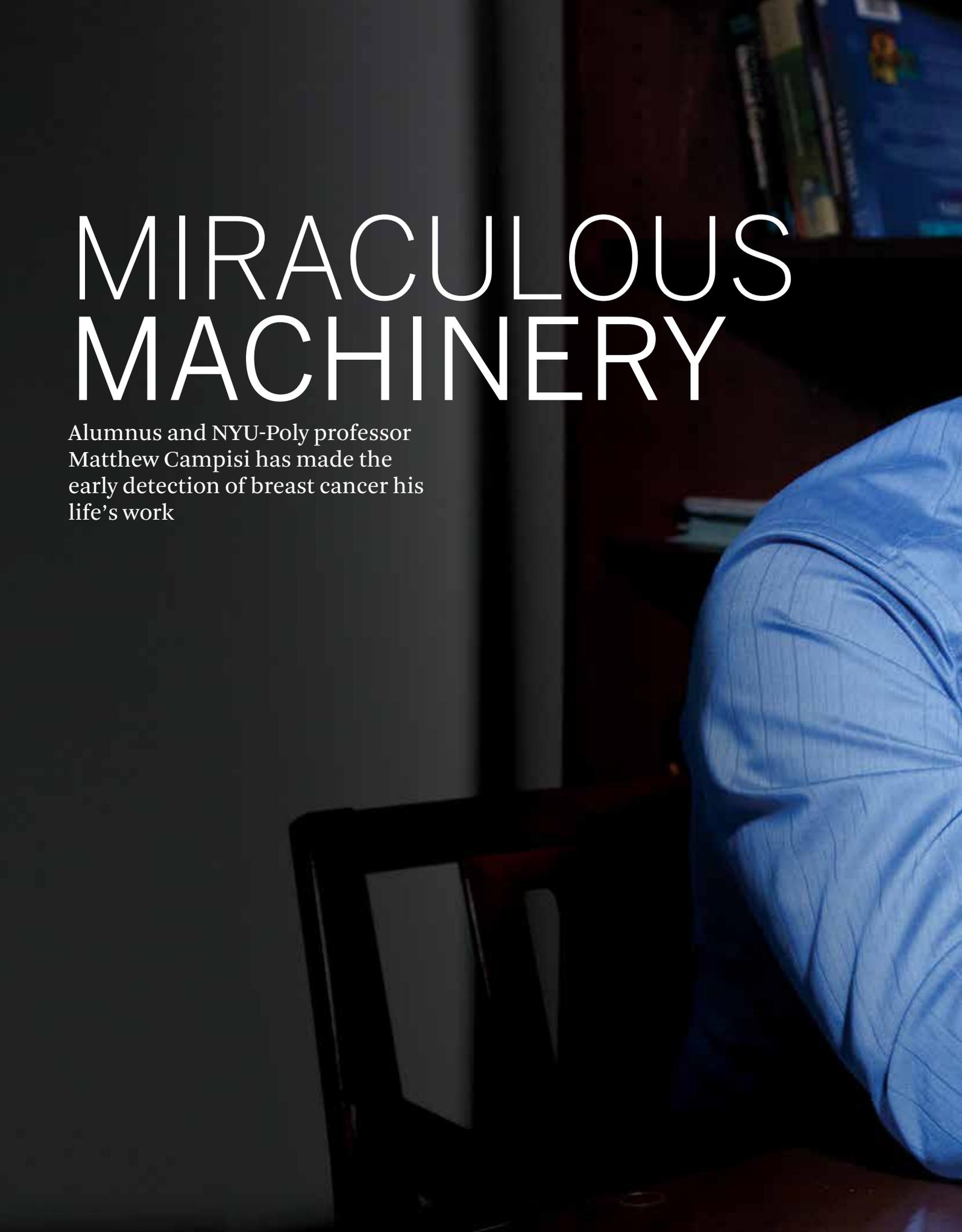
"This building will really enhance the extent and ability of Poly faculty, grad students and post-docs to collaborate and find cross-disciplinary support with NYU researchers, particularly on medical applications," says Mary Cowman, Associate Provost for programs, planning and development at NYU-Poly. "When we work with the medical and dental schools, as well as the nursing school, they provide a broad context for specific problems and we figure out how to approach them. We really tie it all together with our emphasis on bioengineering."

NYU-Poly will have approximately 15,800 square feet on a little more than two floors. Laboratories will be devoted to musculoskeletal, cardiovascular and neuroengineering problems, along with work in tissue engineering and regenerative medicine, biomolecular and cellular imaging and biomechanics.

NYU-Poly engineers will create new medical materials, devices and therapeutics, then prepare them for testing. A support facility is planned for animal testing, which will help researchers prepare for successful human testing by providing near-GMP (good manufacturing practice) resources. "We want devices to get to the market—we don't want missteps," says Cowman. "This will increase the number of products that might be successful."

433 First Avenue will be state-of-the-art green. Such features as recycled construction materials, high-efficiency toilets and low-emitting paints, coatings and flooring mean that 433 will achieve around 30% in energy cost reduction over a standard building.

The building is expected to be finished by early 2015.

A person wearing a light blue, vertically striped button-down shirt is seated at a dark wooden desk in a dimly lit office. The person's back is to the camera, and they appear to be looking at a computer monitor. The background is dark, with some blurred office equipment and papers visible. The overall mood is professional and focused.

# MIRACULOUS MACHINERY

Alumnus and NYU-Poly professor  
Matthew Campisi has made the  
early detection of breast cancer his  
life's work



# In

1996, after Matthew Campisi graduated with a master's degree in electrical engineering from NYU-Poly—where he had also earned his bachelor's degree and met his wife, a computer science major—he happily embarked on a career in private industry. Cancer was the farthest thing from his mind. That changed to some degree when his mother-in-law was diagnosed with breast cancer, but because a woman's risk of developing the disease increases as she ages, it seemed a tragic but understandable occurrence.

It was dramatically less comprehensible when shortly thereafter one of his wife's cousins, not yet 35 years old, was diagnosed. Genetic testing ultimately revealed that the family carried a harmfully mutated BRCA gene. BRCA1 and BRCA2 are human genes that belong to a class known as tumor suppressors. Normally, they help ensure the stability of the cell's DNA and prevent the uncontrolled cell growth that results in a tumor. Harmful mutations of the BRCA genes—such as those present in Campisi's wife's family—have been linked to the development of hereditary breast and ovarian cancer; a woman who has inherited a harmful BRCA1 or BRCA2 mutation is at least five times more likely to develop breast cancer than a woman who does not have such a mutation, and chances are that the cancer will occur at a substantially younger age.

Deeply concerned for his wife's health, Campisi began researching methods of breast cancer detection. He found that while mammography had for years been considered the best screening tool available, there were some problems with the method.

On a mammogram, fat appears dark, while breast and connective tissues appear lighter. Because cancer can show up on the mammogram as light-gray or white patches, it's harder for doctors to interpret the tests in women with dense breasts, which contain a greater amount of breast and connective tissue than fat. While any woman can have dense breasts, they are more common in women who are pregnant or breastfeeding—in a matter of utmost concern to Campisi and his wife—in younger women.

Early detection of breast cancer boosts a woman's chance of survival to an enormous extent, so why, Campisi wondered, weren't there better methods of early detection for young women at high risk of developing the disease?

Trained to be a methodical and tireless researcher, Campisi began reading medical literature and soon discovered thermography, which produces an infrared image that shows the patterns of heat and blood flow on or near the surface of the breast. There was some controversy about the method's usefulness, but Campisi was excited nonetheless. “Efficacy is what's really important,” he said, “and I believed thermography could be a wonderful, life-saving tool.”

Thermography provides valuable information to a clinician because chemical and vascular activity in pre-cancerous tissue and the area surrounding a developing tumor are typically higher than in the normal breast, resulting in an increase in regional surface temperatures. The clinician can thus look at the multi-frame, pixel-level images produced by the unit for signs of high temperature, vascularity and asymmetry.

Campisi, who had taught at NYU-Poly as an adjunct since graduating, continued to do so, but he quit his full-time job in 1999 in order to focus on designing, developing and commercializing globally adoptable and clinically effective non-invasive breast cancer detection solutions. The firm he co-founded is called UELife Sciences.

UE's flagship product, the NoTouch BreastScan, is a computerized digital infrared imaging system, which was cleared by the FDA in 2012 as an “adjunctive screening test for the detection of breast cancer.” Campisi, whose academic interests in-





Dr. John Gomes of Women's Health Care-Garden City, a respected center on Long Island, New York, asserted, "It looks at breast cancer from a physiologic vantage point not visible to anatomic imaging modalities like mammography and ultrasound. So when we combine the information from both sides, we can assess the full picture."

include Biomedical Signal Processing and Communication Theory, firmly points out the importance of the word "adjunctive." "There are no silver bullet solutions, so clinicians are now realizing the benefits of a 'multi-modality' approach," he explained. "Breast cancer detection can involve mammograms, clinical breast exam and other screening methods, including thermography. The NoTouch BreastScan can be offered to women who have been confirmed to have dense breasts on mammograms or women under 40 years old who have not started receiving routine mammograms, but are at risk for breast cancer."

In one recent clinical study, the NoTouch BreastScan successfully detected early-stage, biopsy-confirmed breast cancers with 87 percent sensitivity, and another revealed that the combined sensitivity of NoTouch BreastScan and mammography in women under 50 was an encouraging 89 percent.

Dr. John Gomes of Women's Health Care-Garden City, a respected center on Long Island, New York, asserted, "It looks at breast cancer from a physiologic vantage point not visible to anatomic imaging modalities like mammography and ultrasound. So when we combine the information from both sides, we can assess the full picture."

Because the system, as the name implies, requires no physical contact, and the clinician does not even have to be in the same room, it has proven particularly pop-

ular with women whose cultures place a high value on modesty. Its popularity among women is also due, in part, to the fact that the test is performed while they are seated comfortably, with none of the painful breast compression that mammography sometimes requires.

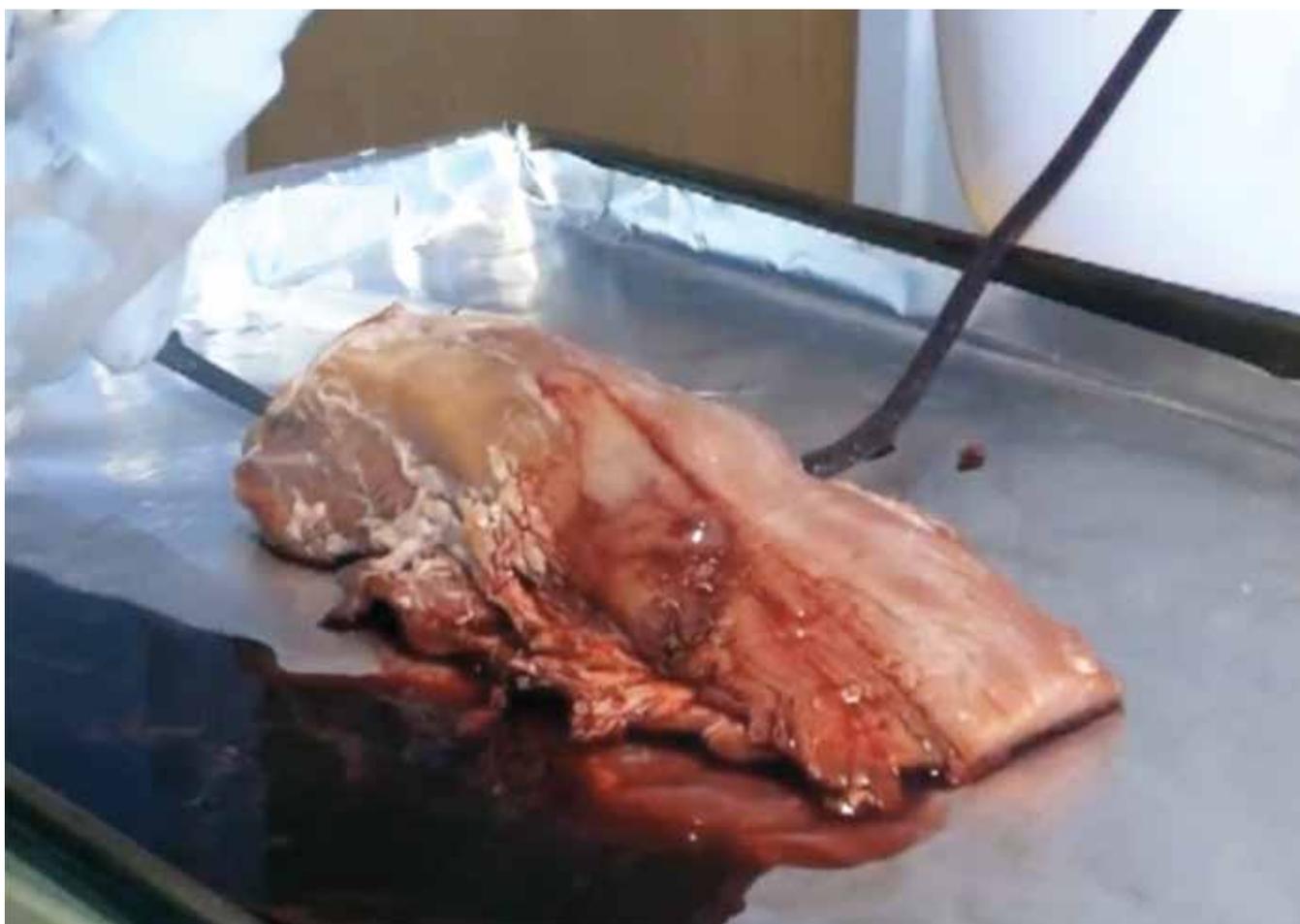
As UEgrew, NoTouch systems began to be used around the world, including clinics in India, Turkey, Kazakhstan and Sri Lanka. Campisi, al-

ways a popular adjunct instructor, was soon able to accept a post as Industry Assistant Professor of Electrical & Computer Engineering at NYU-Poly, where he is also closely affiliated with the Translational Neuroengineering Laboratory. He remains Chief Technology Officer at his Pennsylvania-based company, which was recently awarded a grant from the Pennsylvania Department of Health's CURE program for the development and testing of a new device called the Intelligent Breast Exam, which employs patented tactile sensor technology.

Word is spreading about these new techniques: NoTouch was featured during a September 2012 installment of *The Doctors*, an informational show that airs on CBS, and the February 2013 issue of *Reader's Digest* listed the technology as one of "15 medical breakthroughs."

Campisi is gratified by the press attention only insofar as it will educate more women about the benefits of early breast-cancer screening and thermography. No amount of money, he says, can top the knowledge that his machine has saved the lives of thousands of women and spared their family members from losing a loved one. "When a woman's test shows an early-stage cancer, I tell her it's an occasion to celebrate," he said. "It means that you can treat it now; you've found it soon enough that your prognosis is going to be good." 

For more information on Campisi's work, visit [www.notouchbreastscan.com](http://www.notouchbreastscan.com)



The demo video of Suneris's product, Medi-Gel, runs just 26 seconds. In it, blood pumped through plastic tubing gushes from a deep laceration sliced into a slab of raw meat. A syringe of Medi-Gel is introduced into the wound, bleeding stops on contact, and the surface is spritzed with a clear liquid. The wound appears to be filled and covered with a fleshy, meat-like substance. The video was created in one take on an iPhone.

# A Sticky Situation

**Joe Landolina's Medi-Gel offers an innovative solution to veterinary care and beyond**

When Joe Landolina entered NYU-Poly as a first year student in September 2010, he didn't expect to break new ground in bioengineering by junior year. He'd been interested in medicine since he was a kid tinkering in the chemistry lab of his parents' upstate New York winery: "I tried to make aspirin," he says, smiling. "I was extracting things from plants." That same curiosity about plants and medicine has led to his current position as co-founder of a company poised to change the way wounds are treated.

"When I came to Poly, I encountered i<sup>2</sup>e—Invention, Innovation, Entrepreneurship. Then I heard about the [Entrepreneurs Challenge at NYU's Stern School of Business] and thought, 'Wouldn't it be cool if I could come up with an idea?'" From a summer research program he'd completed during high school, Landolina was familiar with drug delivery and polymers. He knew that solidifying liquids could knit wounds—but existing products worked slowly and relied on potentially dangerous animal proteins. He wanted to try it with plant-based materials.

With former partner Kenny Mai Truong, Landolina found Isaac Miller, then an NYU junior studying finance and management and seeking a partner in the Stern competition. "I was looking for an idea that dealt with engineering solutions and had the potential to make a meaningful contribution to people's lives," says Miller. "Joe made [a] distinct impression as someone capable of solving complex problems from both a technological and business standpoint [and] I could visualize the ways [his product] could make a positive impact [in] treating the most severe and frightening injuries."

Their newly minted company, Suneris—from the Latin *sui generis*, meaning "of its own kind"—won first place in Poly's spring 2011 Inno/Vention competition. Then it won second place in NYU's Entrepreneurs Challenge, which awarded a \$75,000 first prize—and nothing for second. Except, says Landolina, "Taking second got us enough limelight to connect [with] our lawyer [and] accounting firm. It validated that the idea was important enough to keep working on it."

The demo video of Suneris's product, Medi-Gel, runs just 26 seconds. In it, blood pumped through plastic tubing gushes from a deep laceration sliced into a slab of raw meat. A syringe of Medi-Gel is introduced into the wound, bleeding stops on contact, and the surface is spritzed with a clear liquid. The wound appears to be filled and covered with a fleshy, meat-like substance. The video was created in one take on an iPhone. It's remarkable to watch, especially if you consider that, according to Landolina, what Medi-Gel does in roughly 12 seconds takes its nearest competitor on the veterinary market around 10 minutes.

"In pre-clinical trials, I cut a hole in an artery, laid gel over it, and the bleeding stopped," Landolina says. "But when you peel it away, it looks like the hole is healed. It's not gel in the hole. It actually initiates the [body's] healing process. It catalyzes production of fibrin." More testing is underway to substantiate this claim, which Landolina admits may initially sound too good to be true. "I'm surprised by it every time I go into a test," he says.

Medi-Gel's apparent speed and efficacy at stopping bleeding, replicating skin and binding together wounds is one wonder; another is that the polymers that make it work are grown by plants. "A lot of sugars and proteins make up your skin," Landolina explains. "If you mimic their structures with something native to a plant, the body recognizes it as biocompatible. It's not expensive, it doesn't have a prion threat"—infectious agents potentially hidden within animal protein—"and in the wound it looks almost exactly like tissue."

From a technology standpoint, Landolina says, "I'm very lucky. I made one guess, and the guess was correct." Still, it's hard work being lucky. To be taken seriously entering a field in which he has neither experience nor a degree, Landolina has voraciously read scientific journals and business guides on patents and intellectual property. While still a full-time student pursuing a combined Bachelors and Masters in Chemical and Biomolecular Engineering and Biomedical Engineering,

he is traveling to promote Medi-Gel. After its veterinary industry launch this summer, he and Miller hope to get FDA approval to move it into the military. Surgical and personal use are a few years off, but Landolina is "very optimistic"—and his optimism is contagious when you consider the difference his product might make in the life of a soldier or trauma patient.

For Landolina, a self-described "control freak," the steepest slope on the learning curve was asking for help. In the Friday Forum class that he leads on entrepreneurship, he shares this experience: "I was sitting in chemistry class. I had absolutely no resources, but I had the idea. I went up and asked, 'How could I do this?' and was surprised to be given [what] I needed. A lot of people won't ask because they're afraid of the answer. That was the hardest thing to get over: the fear of being turned down when asking for resources."

Miller, for whom co-managing Suneris is now a full-time job, says the pleasure of fostering a new company from its inception has been peppered with the everyday challenges of "preparing for all the things you don't know that you don't know." For example, there was the chicken-and-the-egg problem of funding. As Landolina puts it, "We needed money to do testing, but we needed testing to get money." Help came from family and friends who exchanged loans for company stock. After initial tests were completed, other investors became interested. (It bears mentioning that Medi-Gel's nearest competitor—the one that takes minutes to do what Medi-Gel does in seconds—makes \$100 million per year in the veterinary market.)

If Landolina could time-travel back to his 10-year-old self in the winery's chemistry lab, the conversation would be about setting a course. "From a young age, I knew this was where I wanted to end up," he says. "I just had no idea how to get here, and as a compulsive planner that doesn't sit well with me."

Planning or no, though, wouldn't his 10-year-old self be pretty stoked about what his 20-year-old self is up to?

Landolina grins and nods. "Probably." ◊



Landolina (right) and co-founder and CFO Isaac Miller met while competing together in NYU's Entrepreneurs Challenge

# SUPERSTORMS REQUIRE SUPER SOLUTIONS

**When Superstorm Sandy hit the East Coast in late October of 2012, about a quarter of the cell phone tower sites in the region shut down, causing millions of lost calls. With flood waters rising and winds raging, many could not reach loved ones or emergency services.**

Even days later, service outages remained widespread.

In response, last winter, the Federal Communications Commission (FCC) held its first post-storm field hearing to examine the challenges to the country's communications networks posed by natural disasters like Sandy and other crises. Among the participants was Shivendra S. Panwar, a professor in the electrical and computer engineering department at NYU-Poly, a faculty member of NYU WIRELESS and director of the New York State Center for Advanced Technology in Telecommunications (CATT). Panwar, who is a leader in the field of wireless research, which includes the study of femtocells—small, low-power cellular base stations usually intended for use in a home or office—sat on a panel titled “Outside the Box: New Ideas to Improve Communications Services.”

At the hearing, in addition to discussing femtocells—which connect to the service provider's network via broadband and can greatly expand

both coverage and capacity—Panwar stressed the importance of cooperation between companies to prevent the dangerous service disruptions that occurred during Sandy.

The recipient of numerous accolades, including the IEEE Communication Society's Leonard G. Abraham Prize in the Field of Communication Systems, Panwar was joined on the panel by Brian Fontes, the head of the National Emergency Number Association, a professional organization solely focused on 9-1-1 policy, technology, operations and education issues; Bill Smith, the president of network operations at AT&T; and other select industry leaders. ◯

Professor Shivendra Panwar speaks before the FCC



# TEACHING THE TEACHERS

**NYU-Poly is joining in a consortium with the City University of New York and Columbia University to establish a regional node for the National Science Foundation's groundbreaking Innovation Corps (I-Corps) program, which prepares**

academic researchers to become entrepreneurs and speeds the commercialization of their research.

The New York City Regional Innovation Node (NYCRIN) will educate the academic technologists and connect them with entrepreneurial and business partners. Applicants will be selected by the NSF from around the country. (Participating teams must have conducted NSF-funded research that resulted in intellectual property/patents with the potential to be

commercialized.)

If it seemed natural for the NSF to turn to New York City—given its unique combination of world-class universities, venture capital investment resources and the nation's fastest growing technology startup culture—it was even more natural that the group include Poly, since business incubators and accelerators have long been a key engine of the school's strategy of innovation, invention and entrepreneurship. (Since 2009, graduates of the incuba-



Participants celebrate the launch of NYCRIN

tor program have raised \$40 million in capital, created some 450 jobs and employed 300 student interns.)

NYCRIN will embrace a “learn by doing” philosophy

of entrepreneurship training and emphasize ideas central to the Lean Startup methodology, whose aim is to found frugal, capital-efficient organizations with a low burn rate. ◊

## POWERBRIDGENY WILL LINK CLEAN ENERGY SCIENTISTS AND INVESTORS

**NYU-Poly, in conjunction with the City University of New York, received a \$5 million grant from the New York State Energy Research and Development Authority (NYSERDA) to form one of three “Proof of Concept” Centers in the state, dedicated to helping**

inventors and scientists turn their high-tech, clean-energy ideas into successful businesses. A second award was made to the team of Columbia University with Brookhaven National Laboratory, Stony Brook Uni-

versity, and Cornell University's NYC Tech. The third award was made to High Tech Rochester Inc. The two Downstate centers will be known collectively as PowerBridgeNY.

The centers will connect

inventors and scientists with business mentors and potential investors to help turn good clean-energy ideas into clean-tech companies. Startups emerging from these projects may be eligible for “ignition grants” to fund early post-launch activities.

PowerBridgeNY marks the second collaboration between NYU-Poly and NYSERDA to grow the clean-tech sector in

New York City. Since 2009, they have worked together on the highly successful New York Accelerator for a Clean and Renewable Economy (NYC ACRE). NYC ACRE at NYU-Poly is New York City's first and preeminent clean-tech incubator. NYC ACRE's goals include advancing the city as a role model for a low carbon future and creating technology jobs in New York City. ◊

# FACE TIME WITH A RENOWNED INTERFACE EXPERT

*Avi Ullman, the director of NYU-Poly's Institute for Engineered Interfaces, talks about his newly renovated space, the medical applications of his work and more*

**The excitement swirling around the eighth floor of Rogers Hall is palpable—and well justified. The newly renovated space is now home to the NYU-Poly Institute for Engineered Interfaces' state-of-the-art facilities, which include a synthetic chemistry lab and a cell**

culture lab. To understand why the project, funded in part by a \$3 million grant from the National Science Foundation, is the subject of so much enthusiasm, you need to know what engineered interfaces are and what applications they have in the field of medicine and beyond.

Avi Ullman, who directs the institute, which is typically referred to as the IEI, explained, "Engineered interfaces are those that have designed and controlled physical and chemical properties, such as wettability, adhesion, interactions with other materials, controlling crystallization and chemical reactivity." He continued, "Interfaces are ubiquitous in nature. Solutions to almost all technological and medical problems

require understanding and controlling interfacial structure and interactions."

Ullman, who earned his doctoral degree from the Weizmann Institute in Israel and served as a postdoctoral fellow at Northwestern University, joined NYU-Poly in 1994 after 10 years at the Kodak Corporate Research Laboratories. His area of interest has long been engineered interfaces, which, he points out, can be planar or spherical.

The IEI's core mission will be research, with a strong emphasis on applications. Ullman explained, "Three main research areas are proposed: smart (switchable) interfaces, active interfaces and sensors. These are unifying themes that

provide the basic science and engineering foundation that are required for solving the ever-emerging problems in medicine and technology."

The IEI includes members from not only multiple departments within Poly but from the NYU Dental and Medical Schools as well, and Ullman believes the new space will encourage cross-disciplinary collaboration and cooperation. He said, "The Institute will serve as a hub for addressing critical technological and medical problems, promoting collaboration between scientists/engineers/doctors and specialists who know what are the needed breakthroughs for advancing their areas of practice. Teams of scientists, engineers and medical professionals from across the NYU community will work together to solve critical, still-open problems."

An institute of this type is crucial, he asserted. "Interfacial science and engineering is highly interdisciplinary," Ullman said. "It encompasses diverse activities, from studies of fundamental properties of interfaces, to development of new medical procedures, and new materials with unique properties for myriad applications."

The thrill of having the IEI's brand-new, cutting-edge labs on campus pales in comparison to the thrill of seeing those applications developed and realizing what they could mean to the medical world. "[We might be able to] prevent and find solutions to inflammation, understand how interfaces between an implant and surrounding tissues affect the healing process, produce nanocomposites with superior properties, create advanced chemical and biolog-





Professor Avi Ullman in the newly renovated Institute for Engineered Interfaces

ical sensors, control lateral distribution of molecules, and produce anticorrosion coatings, to name a few,” Ullman said.

While some might find sharing space with fellow scientists to be an imposition, Ullman is pleased by the arrangement. “Shared space provides flexibility, efficiency and cost effectiveness,” he held. “Moreover, students from different groups working together also learn from each other.” (“Naturally, when unique instrumentation is required for research, individual laboratories do make sense,” he added.)

In the lead-up to the ribbon-cutting for the renovated space, NYU-Poly chemistry and chemical engineering merged to a single department. “That was an excellent move,” Ullman stated. “Our department has the opportunity to become one of the top at NYU. A department that will focus on chemical, biological and materials science and engineering can form collaborations in both education and research with chemistry and soft matter physics in Washington Square, as well as with the medical and dental schools.”

But Ullman has his sights set far beyond Washington Square. “A global university [such as we have here] is a brilliant idea. As inexpensive Internet higher education expands, traditional universities would be able to better compete if they offer a unique education and research experience, beyond the classroom teaching. A global university gives our students a rich tapestry of opportunities for professional and personal development and growth. These will impact their careers for the rest of their lives.” ◯

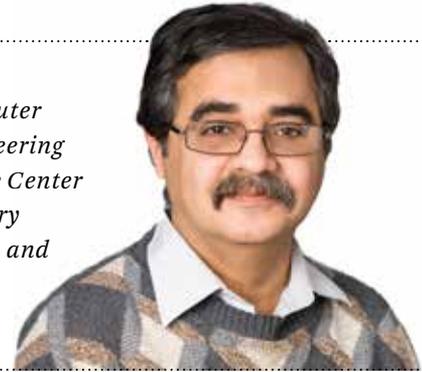
# MEET THE FUTURE

*NYU-Poly's Faculty Discuss the Past Year and What's to Come in Engineering*

We may not have a crystal ball, but we have what may be the next best thing: the collective wisdom of accomplished faculty members in every cutting-edge field from mechanical and civil engineering to gaming and computer science to wireless technologies and mechatronics. Here, one group of esteemed professors looks back on the accomplishments of the recent past and predicts the state of the world—and of engineering—20 years hence. The picture they paint isn't always rosy, but it's always fascinating. One point on which they all agree: engineers will be instrumental in ensuring that we meet any challenges we might be facing two decades from now.

## Nasir Memon

*Professor of Computer Science and Engineering and Director of the Center for Interdisciplinary Studies in Security and Privacy (CRISSP)*



There has been such a surge in the use of mobile devices. They've changed how we work and live. I'm not sure all the changes have been for the better though. At CRISSP we've been doing studies on trust, risk, and perception and how that affects behavior on-line. Are you the type of person, for example, who will fall repeatedly for a phishing scam? If we assess your personality, we might be able to predict that. We did one study that showed that neurotic people will respond to a fake ad if it purports to be for a limited-time offer. They're afraid of missing out, so they don't take the time to make a wise decision. Multitasking also makes it more likely that you won't be paying enough attention to on-line decision making. This type of information is useful to know so that we can better help users learn to be more security minded and aware of their privacy.

More and more of our lives are going to involve technology. We shop on-line, date on-line, bank on-line... much of our lives is basically conducted on-line. And there are malicious people out there who will take advantage of that. We are going to have to be increasingly focused on security.

When engineers design something, reliability has always been a major factor: the

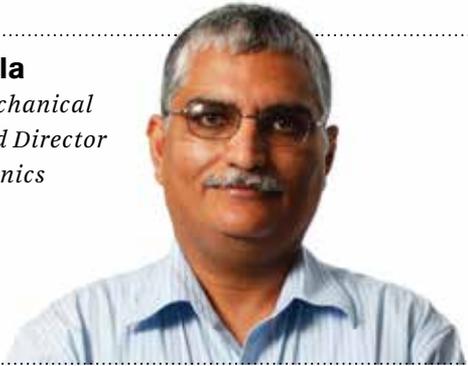
bridge has to hold up, the airplane has to get to its destination. We've done a great job there. But on 9/11, that very reliable plane had a flimsy door separating the cockpit from the passenger section. We hadn't been focused enough on security, and that's going to be more and more of a concern going forward. Think of it this way: if you constantly stay in your house, you're going to be exposed to fewer dangers than if you travel all over the world, simply because you'll be exposed to many more people and places. Using the Internet is the equivalent of traveling all over—you're exposed to millions of people and places and some of them might pose dangers.

Before we spent so much of our time in cyberspace, we watched out for each other; we had the "village"—our neighbors—making sure we behaved well and didn't violate the social contract. We're going to have to do it another way now.

Engineers are going to have to work with security in mind. It will be just as important as reliability. And as we do at CRISSP, they're going to have to take an interdisciplinary approach. Keeping us secure is going to involve not just engineers but policy makers, psychologists, ethicists, law enforcement people and many others.

## Vikram Kapila

*Professor of Mechanical Engineering and Director of the Mechatronics Laboratory*



Over the past year, our lab has been engaged in the design and development of interfaces for intuitive human-robot interaction through mobile apps for robotics and automation. My graduate students have made tremendous progress in producing highly intuitive apps for Apple devices (iPod, iPhone, and iPad) and Google Android devices that allow users to command, control, and monitor robotic manipulators, mobile robots, and other laboratory apparatus through a variety

of inputs (touch, gesture, tilt, drawing, speech, etc.) and outputs (digital readouts, plots, animations, videos, etc.). Our mobile apps for robotics have been envisioned to engage students in laboratory activities, assist people with physical or cognitive disabilities to interact with things like robotic toys and wheelchairs, and help realize the vision of robots becoming commonplace in our society.

We expect that our various research projects on intuitive human-robot interaction will

produce significant research results and potential for commercialization activities. On the K-12 STEM education side, over the past decade we have conducted a diverse set of education, training, and outreach activities for K-12 students and teachers. Our recent education research has demonstrated that robotics-based hands-on learning activities can enhance student learning in science and math classrooms.

Starting in summer 2013, we expect to build on our prior efforts to engage K-12 STEM teachers in robotics and entrepreneurship activities so that they can engage, inform, and prepare their students for industry-relevant engineering and technology studies and careers. We anticipate that this approach will serve as a catalyst for a cultural change that will transform students from mere consumers of technology to

creators of novel technological products.

Generally, I feel comfortable stating that in 20 years, we will be using our mobile devices not just to perform social networking or consume various media but to interact with physical artifacts such as robots, cars, and appliances.

I am hopeful that in 20 years, engineering topics (e.g., additive manufacturing, robotics, bio-engineering, etc.) will become commonplace in high schools, and students will graduate without having developed negative stereotypes of engineers. For the first time in the U.S., K-12 science education is expected to integrate and address standards related to engineering. This inclusion of engineering in K-12 science standards will allow students to appreciate the real-world context of their classroom learning of science.

## Katherine Isbister

*Associate Professor of Computer Science and Research Director of the Game Innovation Lab*



It is exciting to me to see the incredible shift in the everyday device landscape among consumers—smart phone and tablet sales are steadily overtaking full-scale computers. For someone like me, who researches ways to make interaction with technology more intuitive, natural, social, enjoyable—having access to the person using the device,

through touch and movement and cameras, is a tremendous benefit. This means the innovations we are able to make in the lab have a greater chance of reaching a broad audience and making a difference in their everyday lives.

Most of my projects right now are investigating ways to make interacting with technology more socially and emo-

tionally expressive and comfortable—for example, finding ways to repurpose surveillance cameras as a public utility for interaction, and exploring the relationship between fashion and interface to allow people to express a far wider range of their own sentiments and social identity than is normally possible with consumer technology. I see these projects as breaking ground for a new possibility space for everyday technology use that gets us away from desks and keyboards and more engaged with one another and our own physical surroundings.

Over the next 20 years, I see us moving more and more away from seeing technologies (and ourselves) in a 'machine' meta-

phor, and instead I see engineering and in particular interaction with technology moving more towards a biological and 'natural' metaphor. We will expect technologies we use to adapt to our senses, our emotions, and our ways of socializing with one another. I believe engineers will find ways to make technologies far more graceful in their support of human beings. We may reject some of the most inhumane aspects of the current technological landscape—the overly rapid pace that technology pushes upon us, the ergonomically awkward interface to the computer—and instead find ways to build technology that augments and enhances our work and play more adeptly.

## Maurizio Porfiri

*Associate Professor of  
Mechanical Engineering*



I consider myself a theoretical mechanician with an interest in applications across complex systems, nonlinear dynamics, biological groups, and advanced materials. Given the breadth of these interests, it is very challenging to elect the most exciting development over the past year, but I think I've determined a good candidate: the work of Professor Giorgio Parisi and his coworkers on the STARFLAG project in Italy (which started a couple of years ago and is continually developing). This work has demonstrated that neighbor selection in starling

flocks is not due to the relative distance between the group members, as it was believed for a long while, but rather that animals identify only a fixed set of neighbors and use them as a reference in their decision making. This finding posits that the emergence of collective behavior in biological groups is controlled by how individuals perceive their surroundings and how they can identify their group members, so even if a starling sees many other starlings close by, it will interact with only a subset of them, selected on the basis of their per-

ceptual limitation.

I believe that our research on the interactions between animals and robots may have a significant impact in both science and engineering by enabling new conservation and protection methods for social animals, along with hypothesis-driven research in animal behavior. Our work focuses on fish although the methodologies and theoretical tools we are developing can be adapted to other social animal systems, such as starlings. We are trying to understand the visual and pressure cues that a bio-inspired robot should elicit to regulate the behavior of live fish, for example attracting or repelling them. Because fish will not talk for a while, our robots can be used to infiltrate a school and inform us about how the decision process takes place in the group. By preprogramming selected behaviors in these robots, we can test a spectrum of

hypotheses on animal behavior, including the foundations of models of group behavior. In addition, in case of natural disasters or heavy pollution, our robots can come in quite handy in guiding animals away from danger.

We are continuously witnessing a shift of engineering research towards more basic scientific questions, whereby methods developed for the analysis and design of man-made devices are transitioned to explain natural phenomena. I expect this trend to grow further over the next few years and eventually lead to a new conception of the role of engineering research—especially my general field of mechanics. The mathematical rigor of mechanics will continue to aid the understanding of nature and, I believe, at the same time will feed on it, leading to the development of novel branches of mechanics resting upon science.

## Masoud Ghandehari

*Professor of Civil and  
Urban Engineering*



For the past year, I've been working on acquiring data across the multiple domains of our urban systems. If you think of the observations of the 19th-century explorer John Wesley Powell in his book titled *Seeing Things Whole*, his work is very relevant in the current movement of holistic observations and data

acquisition. We have a lot of disparate pieces of information—information about the natural system, our environment; the constructed system, our infrastructure; and the human system, the people. These systems are interdependent in a way that is often the source of cascading breakdowns. Hurricane Sandy is a good example

of this. We are beginning to understand the significance of seeing the big picture by acquiring data (for example on air quality, water quality, health, mobility, energy use, etc.) and analyzing it at higher temporal and spatial resolutions. NYU is taking the lead in this area. The new Center for Urban Science and Progress is a good example, and that's only one of many multidisciplinary initiatives at the University.

NYU-Poly is doing a great job in the area of urban systems, and that's a critical field. Our students will make a difference. Technology has been something of a double-edged sword

for the health of the planet, but they want to use it for good. They are motivating the faculty to teach in new ways, and they welcome the challenges of making a contribution to the world, enhancing the quality of life for millions—and there are so many areas where civil and environmental engineers can really make a difference. The world population is exploding, particularly in areas that lack the infrastructure and resources to sustain it; this is a major problem. Our students will address how those people will have their fundamental needs met. As a faculty member, this is a real motivation for me. 

# FACULTY NOTES

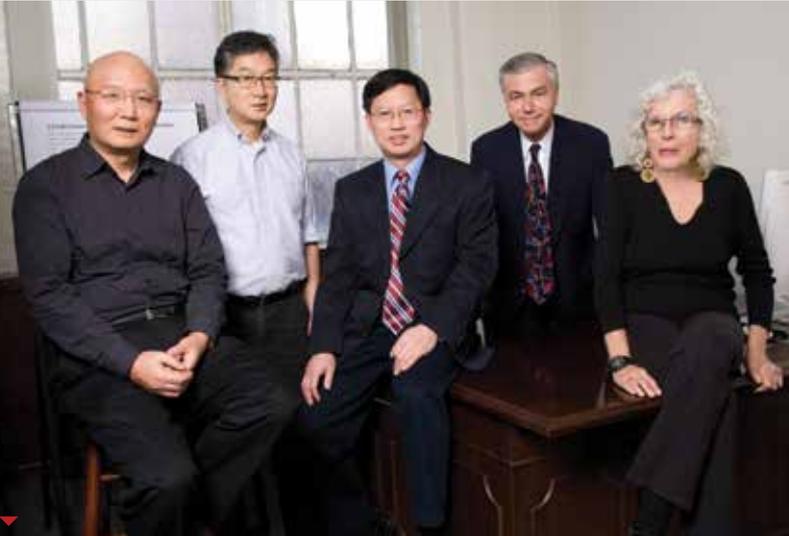
ization. The research team plans to use the algorithms and systems they develop for research projects including wildfire simulation, bird migration simulation and climate science. The

Networking Lab, a two-year, \$366,700 grant to support their research in the areas of routing, load balancing and resilience design—work that will advance the speed and resilience of the Internet. The grant is made through a highly competitive program on strategic network technologies research by the Huawei Shannon Lab.

year project to examine the factors that impact users' interactions with and contributions to social media.

**Jose Ulerio**, an Industry Associate Professor of Civil Engineering, has received a commendation from the American Society of Civil Engineers (ASCE) for his work as the faculty advisor to the organization's student chapter at NYU-Poly. Ulerio earned his BS in Civil Engineering from NYU-Poly in 1978 and an MS in Transportation Planning and Engineering in 1980.

*Choice*, the journal of the American Library Association, deemed **Louis Menashe's** *Moscow Believes in Tears: Russians and Their Movies* (New



The American Mathematical Society (AMS) selected four of the five full professors in the NYU-Poly Mathematics Department to its inaugural class of Fellows of the AMS. An NYU-Poly professor emeritus was also selected. The NYU-Poly professors chosen for the honor are Department Head

**Erwin Lutwak**, **Deane Yang**, **Yisong Yang** and **Gaoyong Zhang**, as well as **Professor Emeritus Lesley M. Sibner**.

NYU-Poly recently signed a master agreement for sponsored research in cybersecurity with L-3 Communications. The agreement streamlines the process by which the partners can begin research projects and speed the delivery of solutions, particularly in hardware security.



**Nikhil Gupta**, an associate professor of mechanical engineering, was given a Young Leader Professional Development Award from the Structural Materials Division of the Minerals, Metals & Materials Society, known as TMS.

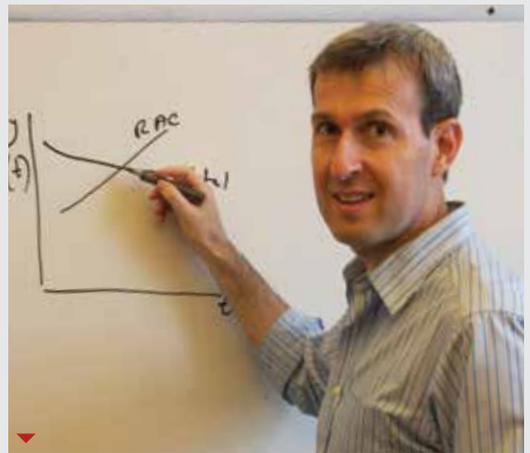
The National Science Foundation awarded a team of NYU-Poly professors an \$800,000, multi-year equipment grant to advance the next generation of Big Data analysis and visual-

project, titled "Acquisition of an Infrastructure for Prototyping Next-Generation Algorithms for Large-Scale Visualization, Data Processing and Analysis," includes **Claudio Silva** as principal investigator and co-principal investigators **Torsten Suel**, **John Iacono**, **Juliana Freire** and **Huy Vo**.



Huawei Technologies recently awarded **H. Jonathan Chao** and **Kang Xi**, researchers at the NYU-Poly High-Speed

Intel Corporation awarded NYU WIRELESS—a center based at NYU-Poly with collaborators at NYU—research funds for fifth generation millimeter wave wireless communications research. Only a handful of universities throughout the world receive funding from Intel's competitive programs.



Google has awarded a multi-year grant to **Oded Nov**, an assistant professor in the Department of Technology Management and Innovation. Working with **Mor Naaman** of the Rutgers University School of Communication and Information, Nov will embark on an ambitious new two-

Academia Publishing) as an Outstanding Academic Title of 2011. The book highlights the important role cinema can play in understanding Russian history, politics, culture and society. Dr. Menashe is Professor Emeritus and past Head of the Department of Social Sciences, and he held the Charles S. Baylis Chair in History.

# A GALA AND A PROMISE

**In the 1970s, the late Jacqueline Kennedy Onassis was instrumental in saving Grand Central Terminal—one of New York City’s most iconic buildings—and during the subsequent restoration efforts she envisioned Vanderbilt Hall as a grand event space.**

NYU-Poly held its own grand event there, just as the legendary First Lady envisioned, on April 17, 2013. The i’e Gala, which drew 350 guests, honored Jerry Hultin, former president of NYU-Poly; Ursula M. Burns ’80, ’05 HON, the chair and chief executive officer of Xerox; and Arthur C. Martinez ’60, ’08 HON, chairman and chief executive officer of Sears, Roebuck & Co. (retired), for their leadership and commitment to the principles of invention, innovation and entrepreneurship.

Tara Lynn Wagner, a NY1 reporter who frequently covers tech stories, served as the emcee for the evening, and attendees heard speeches from Katepalli Sreenivasan, President of NYU-Poly and Dean of Engineering at NYU, and NYU President John Sexton. Although he couldn’t be there himself, former U.S. president Bill Clinton sent his congratulations to the honorees via video, lending his incomparable warmth and charm to the event.

Thanks to the generosity of the attendees and the hard work of all involved in its planning, the gala raised more than

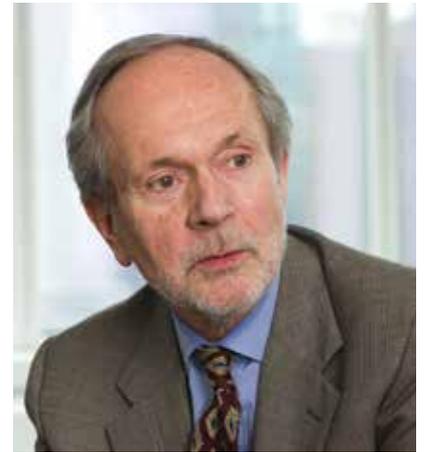
\$720,000. Those proceeds benefit the Promise Scholarship Fund, NYU-Poly’s largest scholarship initiative. Since its inception, the fund has provided financial support to more than 8,000 students, many of whom are from groups traditionally underrepresented in STEM fields, such as African-American, Latino and female students. Additionally, many are the children of immigrants and the first in their families to attend college. This academic year alone, 60 percent of Poly’s undergraduate students come from families with incomes of less than \$50,000, and 58 percent of our undergraduate students—more than 1,000 individuals—received a Promise Fund scholarship thanks to generous supporters.

“I’m happy that we are celebrating our three distinguished honorees in a space as notable as Vanderbilt Hall,” Erica Marks, the interim vice president of development and alumni relations at NYU-Poly, said. “That we are doing so in support of a cause as worthy as the Promise Scholarship Fund just adds luster to the evening.”





The 2013 i3e Gala honorees from top to bottom: Jerry Hultin, past president of NYU-Poly; Ursula M. Burns, chair and CEO of Xerox; Arthur C. Martinez, chairman and chief executive officer of Sears, Roebuck & Co. (retired); At left: Grand Central Terminal's famed clock



# AN INNOVATIVE INNO/VENTION

**If you strolled around the campus over the last few months, you were bound to see posters and screens proclaiming “Thinkers Wanted!” The ad was the brainchild of the organizers of Inno/Vention, an annual challenge to NYU–Poly and NYU students from**

across the globe to prototype and pitch commercially viable ideas for real-world problems.

Inno/Vention is always an exciting major event on campus, but this year’s edition was even bigger and better. For the first time ever, Inno/Vention joined forces with the Entrepreneurship and Innovation Association’s SparkStart, resulting in a multistage competition that had everyone on the edge of their seats at each turn.

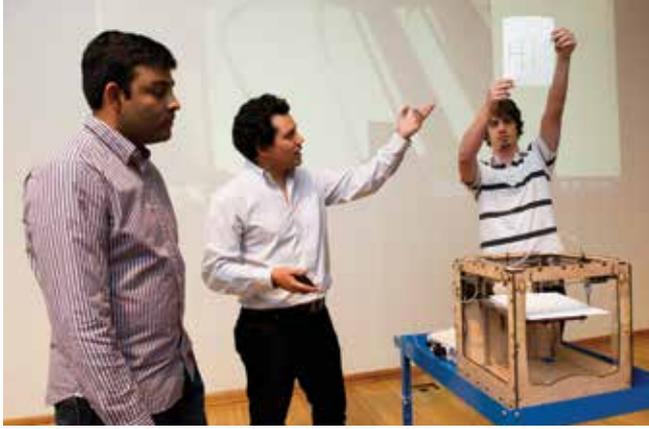
On February 26, for example, a crowd gathered in Pfizer Auditorium, on NYU–Poly’s Brooklyn campus, to watch the Power Pitch—where judges decided which teams would make it to the next level. Among the many great ideas presented were UrbanEden, an automated, modular aquaponic system that would enable any space—vertical or horizontal—to be easily and cost-effectively converted to a high-yield organic farm; the Smart Band, a wearable emergency medical device in which real-time biometric monitor-

ing is coupled with automated emergency communication protocols; and the Heat Nomad, a pouch that automatically heats water and that its creators imagine being used in refugee camps or field hospitals.

Josh Soussan is the team leader on a project called Aegis,

Xi Su, a former member of the Ex-Vivo Dynamics team, is shown here, hard at work





From left to right: members of the Bot Factory team Bharat Jain, Carlos Ospina and Nicolas Vansnick

# WITH FLYING COLORS

which would allow handguns to be disabled by radio transmitter when brought into a school or other such environment. “[Aegis] will not alter the weapon’s functionality at all, unless the firearm is within range of [a] signal emitter,” he explained. “With the recent massacre in Newton, Connecticut, we believe that this is the next crucial step in providing a safe environment for children in schools.”

Antonio Pellegrino, an NYU-Poly student and EIA

board member who helped inaugurate SparkStart and who continues to be involved in the competition—despite the demands of running his own successful business—believes that participating is an invaluable experience. “It’s one thing to have an idea,” he said. “You could have an idea for a submarine that can fly to the moon, but that wouldn’t be very practical. Here at Poly, we’re engineers and builders, and SparkStart and Inno/Vention can help you actually take your idea to market.”

Inno/Vention participants not only have their eyes on the market—but also on the goal of changing the world. ◊

For a complete list of winners visit [www.poly.edu](http://www.poly.edu).

The Middle States Commission on Higher Education (MSCHE) is responsible for accrediting degree-granting institutions in a region that includes Delaware, the District of Columbia, Maryland, New Jersey, New York, Pennsylvania, Puerto Rico and the U.S. Virgin Islands. Since 1930 Polytechnic has been accredited and reaccredited in accordance the Commission’s rigorous review. A team of peer evaluators assigned by the Commission reviewed our 800-page Self-Study Report and visited the campus to tour and to speak with administrators, faculty and students and, as indicated in the exit interview, came away extraordinarily impressed.

Middle States’ accreditation is an expression of confidence in an institution’s mission and goals, its performance and its resources. The review team evaluated NYU-Poly’s performance in each of 14 standards, including mission, leadership and governance, integrity, student admissions and retention, faculty, educational offerings and assessment of student learning.

The Evaluation Team indicated that “we were not only strong regarding all 14 standards, but they also singled out a number of areas for particular praise,” President of NYU-Poly and Dean of Engineering at NYU Katepalli Sreenivasan said. “It is a clear indication that we have come a long way [and] a signal that our collective effort is effective.” ◊

# JAMMING AT POLY

Everyone knows that the products we buy are designed by someone, but many are not aware that the services we use can be too. Since the first service-design course was taught at the Köln International School of Design in the 1990s, however, the field has

been gaining increasing attention. Just in time, too, as we move further away from an industrial economy focused on manufacturing goods to an information economy based on knowledge and—yes—services.

Last semester, the NYC Service Design Jam, an event

organized by the NYC Service Design Network and hosted by the NYU-Poly Design Tinkering Student Club and the Department of Technology Management and Innovation, was held in Rogers Hall's Regna Lounge, where 10 teams collaborated to develop new ideas and con-



cepts. Part of a larger Global Design Jam that took place in more than 120 cities around the world, the Design Jam was a fun, interactive way to educate others about the relatively new field.

Marshall Sitten, an event organizer and founder of the NYC Chapter of Service Design, said, “My favorite part about this is seeing how much interest there is in understanding and improving services. It’s people being more aware of how much of what they do, and how much they interact, with services. It’s people deciding to take a more active

role in the services they use.”

There are few experiences that couldn’t be improved with careful attention to service design and user experience—from obtaining healthcare to shopping to running our homes—and over the course of the weekend, Poly’s Jammers collaborated in teams to design a service that could one day change the way we bank, learn, socialize and more.

“It’s exciting,” Assistant Professor Anne-Laure Fayard, who helped organize the event and who also advises the Design Tinkering Club and teaches a course on Design Thinking, said. “Friday we set up the room. It was just an empty room with tables and now it’s a lively space full of Post-it notes and sketches, with people working together. It has become a kind of a base or camp for people to go back and forth, check in and check out, going out to do some research and coming back to develop ideas.”

After a weekend of brainstorming, the Jammers uploaded their presentations and prototypes for the world to see and presented them in front of their peers. “It’s great if there are some ideas that can be implemented [coming out of the Jam],” Fayard said. “But for the participants it’s a great opportunity to meet new people, collaborate.... For students I think that’s the big learning point.”

The Design Jam took place in a lively space, filled with Post-it notes and sketches



# BROOKLYN WILL SOON HAVE A “MAGNET” TO DRAW GAMING SCHOLARS

*NYU and NYU-Poly faculty are joining forces for the exciting new Media and Games Network*

**New York University (NYU) and Polytechnic Institute of NYU faculty members are a diverse group whose teaching and research often span both technology and culture. The Media and Games Network (MAGNET), a newly renovated space of nearly**

40,000 square feet on the eighth floor of 2 MetroTech Center, will provide them with a place to collaborate and innovate. Expected to open in the fall of 2013, the multi-school facility will house programs in games as a creative art form, game design, digital media design, computer science and engineering—with each program retaining its department affiliation and school identity. Among the schools that will participate in addition to NYU-Poly are the Steinhardt School of Culture, Education, and Human Development, the Tisch School of the Arts and the Courant Institute of Mathematical Sciences.

The establishment of the center is considered an important development in the world of gaming. When the news was announced, Rich Taylor, a spokesman for the Entertainment Software Association, a trade group, told an Associated Press

reporter that game developers are going to find themselves in increasing demand. “This is an industry that has a growing population that consumes the products we create,” he explained. “[The faculty at MAGNET will be] preparing students for the economy that’s awaiting them upon graduation.”

The center will also reaffirm the study of gaming as a serious scholarly exercise. “What new forms of culture are being made possible by digital media? How are games and other interac-

**“[The faculty at MAGNET will be] preparing students for the economy that’s awaiting them upon graduation.”**

tive systems transforming our lives, our ideas and the world we live in? MAGNET is a new approach to answering these questions by bringing together



MetroTech Center will soon be a hub for gaming in New York City

faculty and students from different disciplines in the same physical space,” Frank Lantz, an associate arts professor at NYU’s Tisch School of the Arts

and director of the NYU Game Center, explained. “It’s an opportunity to cut across institutional boundaries and discover powerful new combinations of concepts, techniques, disciplines and talent in order to learn from the past, engage with the present and invent the future.” ◊

# PRESERVING THE PAST

*George Bugliarello's legacy lives on at the Bern Dibner Library*

**Last year the Polytechnic Institute of New York University (NYU-Poly) hosted a symposium, *Livable Cities of the Future*, that brought together an interdisciplinary group of engineers, civic leaders, educators and futurists to examine the critical role engineers**

play in the social and economic development of urban areas and to honor the legacy of the school's late president and chancellor George Bugliarello. Now, the Bern Dibner Library of Science and Technology has unveiled an extensive searchable archive of his papers, including correspondence, memoranda,

reports, minutes, financial records, published and unpublished writings, clippings, photographs, research notes and bound appointment books. "I am delighted that the content of the George Bugliarello collections is now available to our alumni, faculty and students," librarian Jana Richman said.

George Bugliarello, who oversaw a revitalization of both Poly and the surrounding neighborhood, is the subject of two extensive collections at the Bern Dibner Library.



"We are grateful to Violet J. Jacobs and the Jacobs Family Trust for providing funding for this project at this juncture of Polytechnic's history. The collections will assure that the legacy of George Bugliarello and that of the Polytechnic Institute will continue to live on."

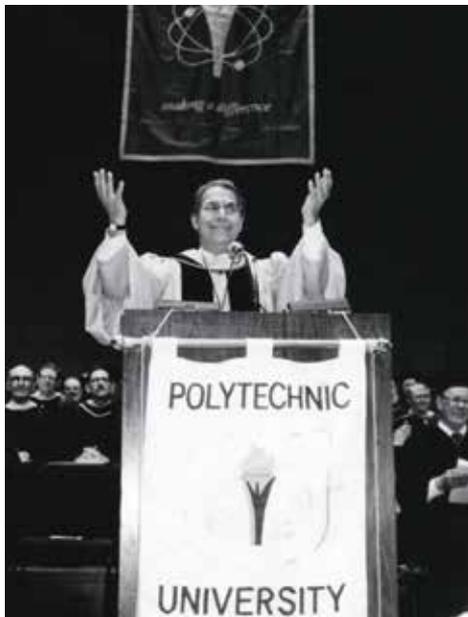
Bugliarello was inaugurated as the 13th president of what was then known as the Polytechnic Institute of New York on October 15, 1973. He took the reins amid a national economic crisis, when several private academic institutions in New York City were on the brink of collapse. Bugliarello—who held

the title of president between 1973 and 1994 and subsequently served as president emeritus and chancellor until 2011—oversaw a revitalization of both the school and its struggling Brooklyn neighborhood.

The Dibner Library's Bugliarello collections (one focused on his presidency and the other on his time as chancellor) are comprised of more than 100 boxes of material, spanning some 120 linear feet. They contain such artifacts as VHS tapes and audiocassettes of Bugliarello's speeches and lectures and the hard drive from the chancellor's office in Room 350 of the Jacobs Building. (The 6,663 digital files on the drive have not been altered in any way from their original state.)

The collections provide fascinating insight into Bugliarello's tenure and accomplishments, including spearheading the ambitious creation of the MetroTech Center. 

For more information on the Bugliarello collection and the entire Poly archive, visit <http://library.poly.edu/about/archives>.



# TWO STRONG TRADITIONS MERGE TO ENSURE AN EVEN STRONGER FUTURE

**If all goes as expected, on January 1, 2014, the official merger of New York University and Poly will be complete—an outcome eagerly anticipated by the entire community. The newly named Poly-technic School of Engineering of NYU, as it will be**

called after that date, marks a major advancement in New York City's stature as a world capital for science, technology and engineering.

The merger is expected to strengthen NYU-Poly's ability to recruit students with interest in science, technology, engineering and mathematics

from around the country, while maintaining the cultural and ethnic diversity of New York and the world, and better prepare science, engineering and technology students, both undergraduate and graduate, to compete in the global economy by integrating in-depth engineering education with man-

agement, medicine, social sciences, and humanities. It will also enhance NYU-Poly's ability to attract and retain leading faculty and provide access for NYU-Poly's students to a much broader range of academic and research programs, including opportunities to study at NYU's global locations.

NYU is expected to gain just as much from the merger, which will re-establish engineering and technology as strategically important disciplines at the university; offer new opportu-

nities for NYU students to enroll in applied science, engineering, and technology programs and courses, to better prepare them to compete in the 21st century global economy; and infuse the inventive, innovative and entrepreneurial character of NYU-Poly's vision and heritage into the sciences, liberal arts, and professional schools of NYU.

Stay tuned for more information on the many wonderful benefits the completed merger will have for Poly alumni. 

## A RISE IN THE RANKINGS

**In 2013, NYU-Poly saw a large jump in its ranking—from 67th to 57th—as one of the nation's top graduate schools for engineering, as measured by the editors of *U.S. News and World Report*. Our goal is to**

break into the top 50 next year and continue to rise.

NYU-Poly also achieved ninth place in the 2013 *U.S. News and World Report* rankings for Best Online Graduate Engi-

neering Programs. NYU-Poly's digital learning program, NYU-ePoly, was one of nearly 860 programs surveyed; only regionally accredited schools that meet federal standards of

entirely online delivery were evaluated.

For its own newly released report, "Top Schools to Study Video Game Design for 2013," the Princeton Review, one of the country's best-known education services companies, conducted an in-depth survey of 150 programs in both the U.S. and Canada, looking at curriculum, faculty, facilities and infrastructure, as well as scholarships, financial aid and career opportunities. After compiling the answers, the editors ranked NYU-Poly/NYU's graduate program in the top 10 percent. 

## ON FIRM FOOTING

For the past three fiscal years, NYU-Poly has achieved solid financial stability, including annual operating surpluses.

**NYU·poly**

# SPICE GIRL

**When she was away at college, at Skidmore in upstate New York, Brooklyn native Gloribell Taveras found herself missing home cooking—especially Latino spices like adobo and sofrito. Latinos put sofrito and adobo on “everything from soup to chili, burgers, rice**

and eggs,” she explains.

In 2001 Taveras earned a business degree with a human resources concentration and decided to pursue a master’s in organizational behavior and human resources management at NYU-Poly. “Poly intimidated me at first because of my liberal arts background among all the engineers,” she admits. But she stayed the course and was awarded her MS degree in 2006. She subsequently worked in human resources at the Sesame Workshop, the organization behind the popular educational program *Sesame Street*, for almost five years, but she never lost sight of her first love: cooking.

In the fall of 2011, Taveras and her best friend, Susana Columna, founded Chulita’s Famous, which makes two types of sofrito, a mix of vegetables, herbs and spices that season traditional Spanish food, and two adobos, dry rubs with a base of garlic that most Latinos use a lot. “Adobo is like our salt,” says Taveras, who points out that Chulita’s adobo is organic and low in sodium, with no fillers. Chulita’s sofrito uses only fresh, natural ingredients with no artificial additives or preservatives.

Chulita’s currently sells its products online and in gourmet specialty stores throughout NYC. “I’m targeting time-strapped individuals and people who like to know what they’re putting in their food,” Taveras says. “We want to get our sofrito into the hands of people who will use it every day. Nowadays who cooks homemade meals? I don’t even cook as often as I like to! I don’t have time! Which is why sofrito is so great—it’s not complex, but it makes a meal. It’s the Latino secret to eating homemade, wholesome meals every day.”

“Chulita” means “sassy girl,” which Taveras says fits her business to a tee. “We’ve had to be persistent and confident that our idea will succeed,” she says. “We honor both traditional Latin cooking and contemporary tastes. To embrace both means that you’re pretty bold.” Their logo is based on a traditional Dominican doll.

Taveras says her education has been invaluable as she launches her business. “At Poly I learned how to create a vision, organize it and execute it,” she says. “My education there definitely helped me. I’m blessed to think outside the box and

Chulita’s Famous makes two types of sofrito, a mix of vegetables, herbs and spices that season traditional Spanish food, and two adobos, dry rubs with a base of garlic





pursue my childhood passion of cooking. Family and cooking and being social are just as important as being successful in corporate America.”

Even though Chulita’s Famous is little more than a year old, it is already seeing some success and was one of four winners of the 2012 Summer Fancy Food Show Contest, sponsored by the NYC Economic Development Corporation to support local food manufacturers.

Taveras has big plans for the future. “First of all, I would love to expand the business and create manufacturing plants that would bring jobs to New York City,” she says. Her ambitions also run to introducing her traditional food to more people. “A lot of Americans feel Latin food is difficult to prepare and isn’t healthy. I want to change that perception and let people know Latin food is healthy and easy to make at home. A spoonful of sofrito and voila, you’re done. Five years down the line I’d like to be on television showing people how easy Latino cooking is.”

Chulita’s is good for everyone from beginners to gourmet cooks, Taveras concludes. “With sofrito you don’t have to be a great cook—your food is still tasty.”

# ALUMNI PILOTS SOAR IN THE WILD BLUE YONDER

**When three NYU-Poly alumni pilots fasten their seat belts and await clearance for takeoff, they can all thank model airplanes for sparking a lifelong passion for flight. John Craparo '90MSM restores and flies 1940s aircraft. Henry Bertoni '62 '67EE flies light-sport**

planes made of carbon fiber. Achilles Sakis '85AE, a major in the U.S. Air Force, test flies advanced fighter jets. A fourth alumnus, Zvi Bar-On '76ME, created the leading after-market aviation-services company.

Craparo's father, a World War II fighter pilot, built model airplanes in the basement and invited young John to join him. "The first time I saw a hot-air balloon, I was elated," he said. He later earned an FAA balloon-pilot license.

Over the next 25 years, he earned sport-pilot privilege in airplanes, seaplanes, gliders and powered parachutes. An advanced ground instructor and light-sport airplane repairman, he is a captain in the U.S. Air Force auxiliary Civil Air Patrol. He restored and flies two 1946 airplanes, a two-seat Ercoupe and a Piper Cub seaplane. The Piper, he said, is so low-tech it is covered with an external cloth "skin" stretched over the metal frame. "Classics offer sights, smells and sounds that remind me constantly that these aircraft are from an age in which utility trumped comfort," he

said.

Craparo, a New York City native, is chief information officer for Briggo, Inc., a firm that created a coffee kiosk with a robotic espresso barista, and the author of *You Can Fly Now*. His earlier career included vice-presidencies at Hewlett-Packard, Dell Financial Services and General Electric Capital Services.

Craparo praises the influence of Professor Richard Van Slyke: "His reductionist point of view influenced all of my management thinking, whether it involved human-resources decisions or economic ones for technology investments. He made my left and right brains equal. This accelerated my career. I moved from manager to the executive level within two years of graduation."

Henry Bertoni, professor emeritus of electrical engineering at NYU-Poly, also made model airplanes as a boy. "Flying was special then," he said. "Propeller-driven planes were more visceral. Today, flying is routine. It's a technical miracle, but few people have the vaguest idea of what makes it work."



In 2004, just before he retired, Bertoni started taking flight lessons in a Cessna 152. He got his private pilot license in 2006—at age 68. Today he flies a light-sport Flight Design CTSW, made of composite materials. Because such planes weigh so little and can be bounced about by air currents, they can be flown

only during the day.

After Bertoni earned his MS and PhD from Poly, he joined the faculty in 1967. He headed the Electrical and Computer Engineering Department twice and was vice provost of graduate studies. Retired from the faculty, Bertoni directs the NYU-Poly Wireless Internet Center for Ad-

vance Technology.

“Our students,” Bertoni said, “are earnest, highly motivated to succeed and without attitude. Industry sees them as willing to do what is needed to get a job done. By helping to educate our students, I feel I have done something useful.”

Watching people fly remote-control model airplanes at age four is one of Achilles

Sakis's earliest memories. Later, the Queens native flew his own model planes. In 1985, after earning a degree in aerospace engineering, Sakis became a Grumman aerospace engineer, conducting wind-tunnel tests of naval aircraft.

Sakis joined the Air Force in 1994 and went on to earn a master's degree in aeronautical science from Embry-Riddle

Clockwise from top left: Major Achilles Sakis flying an F-16; John Craparo in his Ercoupe 415; Henry Bertoni sitting in his Flight Design CTSW; Craparo and his Piper J-3 Cub seaplane at Hayden Lake, Idaho



CLOCKWISE FROM TOP LEFT: ACHILLES SAKIS; MIKE KING/AD; RACHEL TURELY/BERTONI; MIKE KING/AD





Major Achilles Sakis (right) with actor Terrence Howard during the filming of the movie *Iron Man* (2008). Sakis played an Afghani colonel.

Aeronautical University. As captain, he graduated from the elite Test Pilot School at Edwards Air Force Base, in California. He later trained top pilots and flight engineers to evaluate the latest aerospace vehicles, systems and weapons.

At Eglin AFB in Florida, he directed a team that developed and tested the latest air-to-surface munitions. Today, a senior flight-test engineer at Eglin, Sakis directs a 175-person group responsible for improving the combat capability of aircraft and weapons systems. From 2007 to 2010, he was deputy branch chief of NATO's Com-

bined Air Operations Centre in Greece.

Sakis's passion for flying remains intense. He recently flew an F-16 fighter over 14,494-foot

**“Whether I’m discussing aircraft upgrades with engineers or briefing test leaders on weapons performance, I use the engineering principles I learned at Poly every day.”**

Mount Whitney in California. “It was beautiful!” he said. “The sun was low on the horizon, and cast beautiful shadows on the

snowy peaks. I can’t believe I get paid to do this.” His NYU-Poly education is the “cornerstone” of his career: “Whether I’m discussing aircraft upgrades with

engineers or briefing test leaders on weapons performance, I use the engineering principles I learned at Poly every day.”

Zvi Bar-On (featured in *Cable Winter 2012*) is founder and chief executive officer of Component Control, a San Diego-based company that is the leading U.S. provider of after-market services for the aviation industry. The company has an e-commerce division for aircraft parts and a suite of aviation-marketplace software

products. [O](#)

Craparo and Bertoni, who are organizing an alumni aviation club, can be contacted at [polyflyers@gmail.com](mailto:polyflyers@gmail.com).

# DEAR ALUMNI,

*As we are well into a productive 2013, we are pleased to highlight our Alumni achievements as we have done for 150 years since our first Alumni reunion in 1863.*

## Awards, Honors and Elections

Each year, the Polytechnic Institute Alumni Association (PIAA) honors alumni who have excelled in their careers and have made significant contributions to the world of science and technology which we all serve so well. In addition, the Awards Committee looks for nominees for the Dedicated Alumni Award given to alumni who have made notable contributions to the PIAA.

This year, our Awards Committee is pleased to announce the selection of **Ahmad Rahimian** MS '80CE, PhD '86, **Paolo A. Nespoli** BS '88AE, MS '89AE and **Kim Goldenberg** MS '72BE as the recipients of the 2012-2013 Distinguished Alumni Awards. For more information on this award, or to nominate your fellow alumni for 2014, visit [www.poly.edu/piaa/awards](http://www.poly.edu/piaa/awards).

This year will also see us elect new Officers and Board members for the PIAA. Our Nominating Committee has been hard at work. The list of candidates can be found in this issue of

*Cable* and posted on social media channels, so you can prepare to vote at our PIAA Annual Meeting scheduled on Saturday, June 15, 2013 at 11:00 a.m. at the Polytechnic Institute of NYU, Regna Lounge, Six MetroTech Center, Brooklyn, New York. A networking reception will immediately follow. For more info and to register, visit <http://www.poly.edu/events/2013/06/15/2013-piaa-annual-meeting-networking-reception>.

## NYU-Poly Merger and Campus News

NYU-Poly has confirmed great progress regarding the finalization of the merger between NYU and NYU-Poly. As of January 1, 2014, the Polytechnic Institute of New York University will be known as the **Polytechnic School of Engineering of New York University**. "The two streams will merge," President of NYU-Poly and Dean of Engineering at NYU Katepalli (Sreeni) Sreenivasan has stated, "and we hope that each of you will be proud to be a part of an

even greater institution."

As a result, PIAA membership now automatically includes you as a member of the NYU Alumni family. Later in the year, you will receive your NYU Net ID, along with information on activating your NYU alumni account and steps towards receiving your own personalized NYU Alumni Card for access to the numerous benefits, services and exclusive privileges granted to all NYU Alumni.

While change can be thrilling, NYU-Poly realizes that it can also be somewhat unsettling. Our alma mater has assured us that placing enormous emphasis on preserving the great Polytechnic legacy is a priority while meeting the evolving needs of students and community.

That said, may your achievements continue to honor those who have come before you, and may your success carve a path for all who will follow your footsteps.



Best regards,

*Josiane Arbouet*

Josiane Arbouet '96JT'99ISE  
PIAA President

# HOW FAR CAN YOU GO IN SIX YEARS?

*Three NYU-Poly alumni prove that the answer is “very far.”*

**Chris Wilkins, Faizan Sheikh and Sean Walsh may not have mapped out their long-term plans with steely-eyed precision, but each of the 2007 NYU-Poly grads has racked up significant accomplishments in the last half-decade or so. Whether they are consulting with**

the U.S. State Department (Wilkins), making a well-re-

ceived film (Sheikh) or volunteering in Kenya (Walsh), the

three are indisputable proof that an NYU-Poly education can lead to surprising and rewarding paths.

## **From the West Coast to Washington, D.C.**

While earning his master's de-

gree in mechanical engineering at NYU-Poly, Chris Wilkins served as a graduate fellow in a project funded by the National Science Foundation titled Revitalizing Achievement by Using Instrumentation in Science Education (RAISE) at Brooklyn's



Paul Robeson High School. The experience sparked his interest in public education and government policy, but he had many other avenues to explore.

After a 2007 internship at the Southern California-based start-up SpaceX, Wilkins—whose Poly studies had been funded by the National Science Foundation—accepted a full-time position with the forward-looking company. There he helped build the Falcon 1, the first privately developed liquid fuel rocket to orbit the Earth. (That flight was launched on September 28, 2008, from Omelek Island in the Central Pacific, about 2,500 miles southwest

of Hawaii.) He also worked on Dragon, the first commercial spacecraft in history to successfully attach to the International Space Station.

Despite the excitement brewing at SpaceX, Wilkins, who specialized in guidance, navigation and control subsystems, remained deeply interested in government and public policy. He subsequently decided to return to the East Coast to undertake graduate studies in international affairs at Columbia University. Astutely merging his areas of expertise, in 2011 he served as a research intern at the European Space Policy Institute, whose mission is to advise

decision-makers on issues relevant to Europe's space activities.

Seizing the chance to learn how our own government operates on a practical level, in late 2012 Wilkins became a fellow of the American Association for the Advancement of Science (AAAS). Now living in Washington, D.C., he has been assigned to the U.S. State Department, where he explores the convergence of technology and diplomacy and develops methods of increasing efficiency using high-tech tools.

Wilkins recommends a thesis-based master's program like the one he completed at Poly to everyone. "No matter what your field or ultimate goal, it teaches you to think independently and learn new things on your own," he says. "Professor Vikram Kapila taught me that independent thought was absolutely critical; he encouraged me to come up with my own research ideas and fostered my ability to follow through on them."

Kapila, a professor of mechanical engineering, is not surprised at Wilkins's success; while he may never have envisioned his student strolling Washington's corridors of power, he had long known Wilkins was destined for great things. "I was always impressed with his dedication to his goals," Kapila says. "He's enthusiastic, energetic and reliable.... He is undoubtedly going to continue to enjoy professional growth and will significantly impact all of the institutions and professions he may serve in the future."

As for exactly what that future might hold, Wilkins's AAAS fellowship will last for one year,

and he can't predict whether he will remain in the nation's capital, join another cutting-edge start-up or pursue any of the many other possibilities open to him. Kapila and everyone else at Poly will be eagerly waiting to find out.

### Breaking Stereotypes

Ask people to describe a computer scientist, and the image that will probably come to mind is that of a bespectacled individual hunched intently over a glowing screen. Few would envision a dashing, colorfully dressed figure, cutting a move on the dance floor or penning a screenplay. The latter description, however, more accurately describes Faizan Sheikh, who earned his bachelor's degree in computer science from NYU-Poly and went on to write, direct and co-star in *My Angel, My Hero*, a film about a young dancer with Parkinson's disease. "Studying computer science teaches you to do intensive research and to solve problems," Sheikh says. "My time at Poly was invaluable to me in that respect."

A native of Pakistan, Sheikh had always loved Bollywood movies but had never seriously considered filmmaking as a career path. Computer science seemed a logical and practical choice. Still, even the rigorous demands of his classes did not turn him into the figure of popular imagination. Sheikh always made time to see films and to indulge his longtime love for dancing.

During his junior year he began taking classes in digital media with Carl Skelton. "I learned



Chris Wilkins helped build the SpaceX Falcon 1, the first privately developed liquid fuel rocket to orbit the Earth



Left: Film stills from *My Angel, My Hero*, Faizan Sheikh's semi-autobiographical debut film; right: Sean Walsh, managing a project in Kenya for Engineers Without Borders



so much," Sheikh remembers. "It was a brilliant experience. For one project my senior year, I made a film about a dancer with Bollywood aspirations, and the auditorium was crammed with 500 people."

Despite his own artistic aspirations, Sheikh, who had often taken part in live dance performances while at school, took a programming job in the financial sector upon graduating. Dance and film remained important to him, however, and he regularly fantasized about bringing hip-hop to his native Pakistan, where contemporary dance, while not exactly taboo,

got little respect as an art form.

In late 2008 Sheikh, who was volunteering at a film festival, met Danny Boyle, the maker of the newly released *Slumdog Millionaire*. The two chatted, and Boyle was warmly encouraging. He had no idea, he explained, if *Slumdog* was going to be a critical or commercial success, but it had been gratifying to pursue his vision. A few months later, after watching the picture win eight Academy Awards, Sheikh realized that Boyle had given him invaluable advice, and he set about writing and filming *My Angel, My Hero*. (Chris Alverez, head of a media production

startup that had its genesis in an NYU-Poly incubator, became a co-producer.)

*My Angel, My Hero*, which contains numerous autobiographical elements, concerns the relationship between a former investment banker (played by Sheikh) and a teenage street dancer suffering from Parkinson's disease, a degenerative condition that affects the central nervous system. In the course of researching the film, Sheikh had met Sheree Loftus, a doctor who runs support groups for Parkinson's patients, and Pamela Quinn, a dance instructor with Parkin-

son's who now specializes in movement therapy. The women's work inspired him, and while he still entertained notions of bringing hip-hop to Pakistan or winning an Academy Award like Boyle, those things paled in comparison to the possibility that *My Angel, My Hero* might actually touch people or change their lives.

*My Angel, My Hero* premiered at a South African film festival in 2010 and has since been shown at almost 20 other festivals. Each time it is shown, Sheikh is approached by grateful Parkinson's patients, appreciative of seeing their travails depicted on the big screen and buoyed by the film's positive message.

Sheikh now heads a non-profit known as Enliven Fabula, whose mission is to encourage people to tape their stories of living with Parkinson's, autism, and other conditions. The videos are then posted online, where they can inspire and educate viewers. "The name Enliven Fabula means 'giving life to stories' and I selected it because I believe that every moment is a story, every story has a message, and we should give life to these stories through film, dance, music, painting and other art forms," Sheikh says. "Art has the power to positively impact people in communities around the world."

#### Engineering Knows No Bounds

Sean Walsh, now a practicing licensed professional civil engineer, found out about the non-

profit organization Engineers Without Borders (EWB) while studying at NYU-Poly, but his class schedule was so demanding that he had little time for any additional workload. The idea remained with him, however, and he knew that he wanted to get involved one day. That day came in 2009, when he joined the New York professionals chapter of the group and was later recruited as the project team lead for the Matunda Health Center (MHC) Water Project. The only fully accessible health facility serving a Kenyan town of

some 20,000 residents, the center had relied on contaminated water from a rudimentary hand-dug well and nearby streams for cleaning medical instruments and treating patients.

Walsh's EWB team embarked on an ambitious project to provide the center with a modern system that would include a 400-foot-deep well, a water-storage tower, sustainable drainage, plumbing fixtures and more. "Overseeing a project of that scope was a terrific opportunity for a young engineer," Walsh says, explaining that he might

not have been given that degree of responsibility for several years into his career otherwise.

In late 2011—after the system had been constructed with the help of Kenyan volunteers, and MHC personnel and key community members had been trained to maintain its components through a newly founded Water Board—EWB team members returned to the MHC to assess the project. They found that overall conditions at the hospital had greatly improved due to the availability of potable water. "To give just one

example, the number of women coming to the center to give birth has more than doubled, thanks to the fact that there is now a shower in the maternity ward," Walsh says.

EWB is not Walsh's only pro bono activity. While working for the firm ARCADIS, which is deeply involved with the United Nations Development Program, he was sent to Indonesia—then still reeling from a devastating 2005 earthquake and tsunami—to work on a solid-waste project. "Engineers have a responsibility to put their knowledge to use for the public well-being," Walsh asserts. Besides fulfilling that responsibility, his work has allowed him to make friends all over the world. "You should see my Facebook feed," he jokes. Now firmly established professionally, he is also committed to mentoring younger engineers, much as he was mentored at Poly. (He remembers professors Magued Iskander and Ilan Juran of the civil engineering department with particular gratitude.)

Walsh is currently employed by Eustis Engineering Services, LLC, a venerable firm based in Louisiana. Eustis, he proudly notes, has been instrumental in the revitalization of New Orleans following Hurricane Katrina. He admits that working in the southeast United States is particularly challenging. "Building infrastructure on soft, compressible ground is much more difficult than in a setting like New York, with its bedrock," he explains. Still, it would take more than that to slow Walsh down. After all, traveling to remote African towns or toiling in tsunami-devastated regions—it's all in a day's work for him. ◯



# FROM RUSSIA WITH LOVE

*Decades Later, Former Professor Natalie Lipsett Maintains a Deep Fondness for Poly*

**When Natalie Lipsett arrived in America at the age of 19, she had already seen more of the world than many people do in a lifetime. Born in Russia in 1919, she was just two months old when her parents fled the political turmoil there. After a brief stop in Warsaw, they**

settled in the Free City of Danzig, where Natalie, an only child, was raised in an atmosphere of culture and comfort.

Due to her training in high school, Natalie was virtually fluent in English by the time the Nazi Party took over the government in Danzig, making an escape to the U.S. seem a wise choice. Family friends who had immigrated earlier suggested

she had intended to teach, after graduating she found there were few such jobs available. She was, however, hired by the New York Public Library to oversee foreign-language periodicals, and she eventually settled happily into married life and motherhood.

That changed when the Soviets launched Sputnik in 1957, setting off the arms race. "All of a

moment to stay close to home because she had school-age children, Natalie accepted an offer from Poly. Although the decision had been made for purely practical purposes, she quickly fell in love with her students. "Many young people at Poly were the first ones in their families to attend college, and they were so dedicated and hard-working," she remembered. "I didn't

have a science background, but between my knowledge of Russian and their scientific knowhow, we did wonderful work to-

gether." (Having grown up in a home filled with art and raised by a concert pianist mother, she delighted in taking some of her charges to the theater and concerts during her off-hours.)

Natalie—who once translated a collection of Albert Einstein's letters that explored his feelings about Israel—became equally fond of her colleagues, and she was grateful to be of-

fered a professorship despite not having a doctoral degree. "I could never complete a thesis because of the demands of my family life," she said. "So you can imagine what an honor it was to be given the chance to teach at the university level. It felt like a miracle to me!"

Natalie left Poly to move to Florida in the 1970s. There she became involved with the Lifelong Learning Program and lectured at the Palm Beach Community College (now Palm Beach State). Still, she never forgot Poly and her fulfilling time as a faculty member. She has made regular monetary contributions over the years, and she is considering including a bequest in her will, to be earmarked, in all likelihood, for scholarships. "If I had not been given a scholarship all those years ago, it's very likely I might have spent my career behind the counter at a five-and-dime," she asserted. "Other young people deserve the same opportunities I had." ◊



**"...between my knowledge of Russian and their scientific knowhow, we did wonderful work together."**

she study at New York University and offered to pay a semester of tuition for her.

Natalie, who majored in French, showed a marked aptitude for study, and when the time came to register for a second semester, she won a full scholarship—a fortuitous turn of events since her family was struggling financially in their adopted homeland. Although

sudden, it occurred to the scientific community in America that they might have known about the launch in advance had they been able to read the journals being published in Russia," Natalie recalled. "They quickly realized there needed to be courses offered in scientific Russian, and I was offered jobs by four universities."

Living in Brooklyn and want-

# JOLLY GOOD FELLOWS

**Since 1963, when IBM instituted its Fellows program, fewer than 250 employees have earned that distinction. Although they are few in number, IBM Fellows have generated nearly 7,500 patents, received five Nobel prizes and thousands of government and**

professional citations and have a massive store of published research in scientific journals. This year, eight employees, cho-

sen for their innovations in such strategic areas as cloud and mobile computing, big data and business analytics, will be joining that elite group.

While any school would be proud to have even one of those eight as an alumnus, NYU-Poly has the honor of claiming two: Dinesh Verma '98MOT and John Ponzo '95CS.

Verma, who heads IBM Research's IT and Wireless Convergence, is now creating a new pipeline of networking technologies that will play a pivotal role in IBM's mobile strategy. He says, "Becoming an IBM Fellow is a dream come true. It is a reaffirmation that my approach to technical innovation is a great

match for IBM, and gives me confidence that I can mentor and lead others to achieve technical excellence."

Ponzo is playing a huge role in keeping IBM at the forefront of mobile enterprise technology, and he authored the "Enterprise Mobile" and the "Mobile First" theses that are the cornerstone of IBM's mobile strategy and execution. Recently named IBM's CTO and technical leader of Mobile First, he says, "Innovation can be nurtured like anything else.... If you like what you're doing, you naturally begin to explore the limits of your work."

NYU-Poly congratulates the two innovators and is happy to have helped nurture them. ○

Poly alumni Dinesh Verma (third from left) and John Ponzo (fourth from left) are among the newly named IBM Fellows



# CLASS NOTES

## Charles Knuth '44 '47 '49CH

Charles Knuth is retired from Pfizer Inc. At Pfizer, he began in the lab and finished his career there as Director of Patents. During WWII, he worked on the Manhattan Project at Los Alamos and other locations. He currently lives in Manhasset, NY and enjoys hearing news of his four daughters and six grandchildren. He has written a six-volume family history in his spare time.

## Stanley Mazur '48EE

Mr. Mazur is splitting his time between Santa Monica, CA and New York, NY, living on 12th St in both cities. He and his wife are enjoying retirement as active consumers of classical music and museum art venues.

## Robert Unterreiner '48ME

Robert Unterreiner has spent forty-eight years in the petroleum and chemical industries. He spent twelve years at the Phillips Petroleum Company as a product application engineer dealing with olefin

polymers. His remaining thirty-one years in the workforce consisted of eight years of market research with Spencer Chemical Company in Kansas City, MO and twenty-three years as a polymer and chemical market research manager with Amoco Chemical Company in Chicago, IL. He has since involved himself with hobbies in liberal arts dealing with music, history, and circus entertainment. His circus activities include playing percussion with circus bands.

## Richard J. Katucki '51PH

Richard Katucki, 83, is currently enjoying retirement by travelling worldwide. He is glad to have contributed to the birth and development of space technology. He helped develop the Nimbus Satellite and Earth Resources Satellite, and hopes to one day see a nuclear power source on the moon.

## Robert "Rip" Bernert '54CH

Robert Bernert was awarded US Patent 8,069,678 B1 on 6 December 2011, titled

"Heat transfer in the liquefied gas regasification process." Robert is currently a consultant to Thermax Inc, a company he co-founded in 1973. Thermax is now run by his son Robert Jr, who graduated with a degree in Mechanical Engineering from Cornell in 1980.

## John Cagnetta '54 '66CH

John Cagnetta was recently awarded the Distinguished Service Award from the Connecticut Academy of Science and Engineering in recognition of outstanding service and dedication, as follows: Member of Governing Council of the Academy, 1995-1998; Vice President, 1998-2000; President, 2000-2004; Past President, 2004-2006.

## Horace L. Morancie '58CE

Horace Morancie was recently commended by *EVERYBODY'S*, the Caribbean-American magazine, for his immense contributions in promoting the nation of Trinidad and Tobago abroad. He will be recognized at a gala in honor of Trinidad and Tobago's 50th independence anniversary.

## Dr. William T. Sha '58ME

Dr. Sha authored *Novel Porous Media Formulation*

for *Multiphase Flow Conservation Equations*, published by Cambridge University Press in September 2011. It details a set of conservation equations of mass momentum and energy for multiphase flow via time averaging of local volume averaged Navier-Stokes equations, which have been derived for the first time. These equations are in differential integral form, in contrast to a set of partial differential equations currently being used. The integrals arise due to interfacial mass, momentum, and energy transfer.

## Allan F. Anderson, Sr. '60AE

Allan Anderson, recently retired, is residing in Saratoga County, NY. His past experience includes work with: Pratt and Whitney Engineering Design in Hartford, CT; Battelle Memorial Institute, MIL-HDBK-5 and Test Programs in Columbus, OH; GE Aircraft Engines, Materials Testing in Cincinatti, OH; GE Large Steam Turbine and Gas Turbine, Mechanics of Materials in Schnectady, NY

## Robert H. Jankowski '65CE

Mr. Jankowski is still working at Northrop Grumman Aerospace Co. in Bethpage, NY, but is finding time to enjoy his three

grandchildren.

## Joseph La Rosa '65AE '68ME

Joseph La Rosa has recently retired after working at Pratt and Whitney for over thirty-eight years. His responsibilities as chief engineer have been replaced with more free time to pursue his interest in jazz improvisation on the piano.

## Zindel H. Heller '67EP

Zindel Heller is still proud to call himself a "Brooklyn Poly" alumnus when asked where he got his degree.

## George Foo '73MT

Mr. Foo is the EVP of Operations for Emerson Electric and is currently based in Hong Kong.

## Josephine Paltin '82IE

Josephine Paltin is a registered patent attorney specializing in high technology areas, including telecommunications, networking, voice-over IP, wireless, and location-based services; software products and methods, including mobile and social network systems; weapons systems; and transportation control systems. Josephine's practice is mostly directed

at patent prosecution and client counseling in regard to intellectual property protection. She works in Holmdel, NJ.

**Stanley Davis**

'86PH

Mr. Davis, a laboratory astrophysicist, studied nuclear fusion in France as a Fulbright/Aquitaine Research Scholar from 2008-2010.

**Alan Kessler**

'99TP

Alan Kessler is currently a senior transportation engineer working to rezone and review site plans for transit-oriented developments.

**Paul Richardson**

'10EE

Mr. Richardson was awarded the prestigious 2012 EPRI Technology Transfer award for the first application of Advanced Data Acquisition and Diagnostics Using Portable Electronic Technology.

MAJOR CODES

- AE Aerospace Engineering
- CE Civil Engineering
- CH Chemical Engineering
- EE Electrical Engineering
- EP Electrophysics
- IE Industrial Engineering
- ME Mechanical Engineering
- MT Metallurgical Engineering
- PH Physics
- TP Transportation Planning

# ERIC MARTIN WUNSCH

**W**e deeply mourn the March 20, 2013, death of Eric Martin Wunsch, whose history with NYU-Poly spans generations. Both his father, Joseph, and uncle, Samuel, were graduates of the school. After World War II, Martin, as he preferred to be called, joined the business they had established, Silent Hoist & Crane, where he employed his mechanical engineering skills to design and build mobile cranes, electric forklifts, capstans (rotating machines with vertical axles, used for hoisting weight), and enormous devices for handling shipping containers that helped expand the capacity of American ports. He later took over the company, which grew to become one of the most important in the industry.

An avid collector, he amassed unrivaled collections of American furniture and Old Masters paintings, and his efforts to preserve America's art history have been widely lauded.

He had a particular passion for restoring old buildings, and in the mid-1990s, he supported the restoration of the Bridge Street African Wesleyan Methodist Episcopal Church, an 1847 Greek Revival building that had provided sanctuary to fleeing slaves during the Civil War and blacks escaping the Draft Riots of 1863. The building, next door to 15 MetroTech Center, had been given landmark status and was acquired by NYU-Poly for \$1 on the condition that the exterior be restored to its original form. The work would not have been possible without Martin, and the beautifully restored structure now stands as the Wunsch Student Center Building.

The entire NYU-Poly community extends our condolences to his wife of more than six decades, Ethel; his son, Peter; and to the rest of the family.

**Jerome M. Schulman**, a physical organic chemist who began his teaching career at the Polytechnic Institute of Brooklyn (now NYU-Poly) in 1968, died on July 24, 2012. He was 74 years old.

A distinguished scholar who later joined the faculty of Queens College, he conducted research in such areas as Raman and nuclear magnetic resonance spectroscopy and thermodynamic and quantum mechanical calculations. He retired from teaching in 2001 but continued his research until just a few months before his death. Schulman was an emeritus member of the American Chemical Society.

**Leopold May**, who earned an M.S. in chemical engineering in 1949 and a Ph.D. in chemistry in 1951 from the Polytechnic Institute of Brooklyn (now NYU-Poly), died on June 17, 2012. He was 88 years old.

A former Navy radio technician instructor, he joined the chemistry department of the Catholic University of America in 1959. He became a pioneer in the science of applying infrared and Mössbauer spectroscopy to biological samples and made several major contributions to the fields of archaeology, ecology, and forensics. He retired from teaching in 1997 but continued to conduct research until 2012.

He served for a time as the editor-in-chief of *Applied Spectroscopy* and later sat on its editorial board. In 1971 he was elected president of the Society for Applied Spectroscopy, and he was an emeritus member of the American Chemical Society.



# DANIEL ROBINSON

**T**he entire NYU-Poly community mourns the January 9, 2013, death of alumnus Daniel Robinson '55EE, who earned a master's degree in electrical engineering here after attending Howard University. Even before becoming a senior member of the Institute of Electrical and Electronics Engineers (IEEE) and conducting important research on fields and waves, Robinson was blazing trails.

A native of Philadelphia, he was among the first African-Americans to join the U.S.

Marine Corps. Entering the military in 1943, when he was 18, he served as sergeant with the 52nd Defense Battalion and was stationed in the Pacific throughout his tenure. In 2012 he was awarded the Congressional Gold Medal of Honor, the highest civilian honor bestowed by Congress.

Robinson's upstanding nature and sense of civic responsibility made him a source of inspiration to his brothers in Alpha Phi Alpha and to his fellow members of the Rotary Club. He was, additionally, an exemplary

role model to the boys of Troop 74, for which he volunteered as an assistant scoutmaster.

Robinson—a member of several boards and the founder of SEICO, a provider of radio and television communications equipment—embodied the Poly spirit of invention, entrepreneurship and innovation. We have lost a valued member of our community, and our deepest condolences go to his children, Anstella, Daniel, and Angela; and to siblings Clifford, Durald, Marva, Alberteen and Leola, who survive him.

## IN MEMORIAM

Robert H. Eisengrein '41  
 Jean Mayers '42 '48  
 George Papps '43  
 Henry J. Chaya '44  
 Robert A. Blohme '50  
 John J. Gersic '53  
 Daniel E. Robinson '55  
 James J. Kassar '56  
 Arthur J. Leidich '59 '64  
 Michael J. Lerman '59  
 George G. Sabak '60  
 William K. Woll '61  
 Alan M. Weinstein '65 '66 '72  
 Michael H. Kappaz '70, Trustee  
 Ed Koch, '83H  
 Otto F. Gerkenmeier,  
 Postgraduate

# CRUISE THE PANAMA CANAL

January 16 to February 3, 2014

The NYU Alumni Association invites you to cruise the shores of the Americas, from Miami to Central and South America, passing through the renowned Panama Canal on its 100th anniversary. On this special centennial, we celebrate with great pride that Henry Goldmark, a 1874 graduate of NYU-Poly (then known as the Brooklyn Collegiate and Polytechnic Institute), co-engineered the development of the Canal's lock system, work that garnered him a medal of honor from President Howard Taft.

Discover unspoiled natural wonders, dramatic coastlines, and the remains of ancient civilizations on an 18-day voyage aboard the graceful and inviting Oceania Cruises Regatta, which offers every indulgence imaginable.

For more information call 1-800-842-9023 or visit [www.GoNext.com](http://www.GoNext.com)

## Polytechnic Alumni Annual Meeting & Nominations Announced

The annual election of officers and directors of the Polytechnic Institute Alumni Association, Inc. will take place at the Annual Meeting on Saturday, June 15, 2013 at 11:00 a.m. in Regna Lounge, Six MetroTech Center, Brooklyn, N.Y. All alumni are invited to attend and vote. A professional networking reception will follow the meeting and vote.

The Association's Nominating Committee has presented the following candidates:

*Officers (two-year terms):*

**PRESIDENT:**

Gerald Dawes '84 '89  
Philip Furgang '60

**EXECUTIVE VICE**

**PRESIDENT:**

David Bomzer '06  
Leonard Singh '98

**VICE PRESIDENT:**

David Campaña '96  
Neil Weiser '73

**TREASURER:**

Christopher Clinton '09  
Max Han '98

**SECRETARY:**

Debra Freedman '81  
Eric Levenstein '06 '08 '10

**INTERNATIONAL BOARD**

**OF DIRECTORS:**

*five positions*

*(three-year terms)*

Joel Fernandez '11  
Jose Garcia '09  
Brian Gil '11  
Charles Hinkaty '70 '72  
Alan Hyman '95 '12  
Frank Namad '68  
Edward Sawchuk '76  
Aiwu Shi '08  
David Sobin '72  
Nikolai Wolfe '09 '11

For full details and to confirm your attendance, please visit [www.poly.edu/piaa/annualmeeting](http://www.poly.edu/piaa/annualmeeting)

or call (718) 260-3885 to request additional information or a hard copy of the agenda and meeting documents. If you are unable to attend in person, you are encouraged to vote by proxy. Details regarding proxy voting can be found on the website.

# NYU:poly

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