You reap the benefits of your NYU Polytechnic School of Engineering degree every day. Have you been reaping the benefits of your PIAA membership?

Get ready to receive even MORE in 2014!

- **MORE** opportunities to network
- **MORE** great trips and chances to travel with fellow alumni
- **MORE** valuable discounts
- **MORE** museums, shows and other entertainment options
- Access to **MORE** clubs, libraries and gyms

Be on the lookout for MORE information in the mail, on the Web, and in the pages of Cable.
23 **Innovation, Collaboration, Incubation**
Since 2009, NYU Polytechnic School of Engineering Incubators have impacted the NYC economy in countless ways. The projections for the future are even more remarkable, but the human element of Varick Street, DUMBO, and NYC ACRE is what makes our incubator system truly unique.

28 **Challenge Accepted**

NYU’s Grand Challenge has inspired thirty-two research projects this year alone. One team, bridging gaps between disciplines, is exploring neuroprosthetics to develop a “one-size fits all” prosthetic device.

31 **White Hat Hackers Unite**

Dan Guido, our Hacker-in-Residence, teaches his students to develop strategic defenses based on real data. This year, THREADS, the security conference that Guido founded, continued to explore the issue of defense and served as the first public forum to discuss the DARPA-sponsored Cyber Fast Track program.

34 **The Real Cyber Experts**

In a world where digital data are essential to every facet of our lives, our reliance on cybersecurity is becoming more crucial. At CRISSP, educators and students focus on creating exceptionally secure information technologies.

36 **Engineers Abroad**

NYU Polytechnic School of Engineering students have embraced an international education by traveling to London, Florence, Tel Aviv, and Paris. While the students agree they were exposed to a unique education, they brought back more than just souvenirs; different cultures and new experiences molded them into global citizens.

40 **Sowing the Seeds for Collaborative Research**

In 2009, a $5 million “seed” fund with the goal of supporting research projects between NYU and NYU-Poly faculty was announced. Four years later, the seed-grant program supports projects between faculty from the NYU School of Engineering and other NYU schools.
Dear Alumni and Friends,

write with great pleasure as I contemplate our newest students, nearly 600 aspiring engineers and scientists who comprise the Class of 2017, the first four-year class that will graduate from the NYU Polytechnic School of Engineering. (It became official on January 1, 2014.) These students possess a wide array of talents and passions, and among their ranks are inventors, business owners, activists and volunteers. Some, like John Meyer, a computer science major, can claim all those qualifications. As the CEO and lead engineer of the tech company TapMedia, John had developed 34 iPhone apps at the time of his admission. He is also the founder of DevFund, an initiative that encourages inventors of apps to donate a portion of their earnings to charity. John is representative of the high caliber of the School of Engineering Class of 2017, about which you will be reading more in upcoming issues of Cable.

SAT scores for our incoming freshman have been steadily increasing over the last several years. For this year the average score for full-time incoming freshman is 1342, an impressive gain of almost 30 points over the previous year. Our recent transformations seem to be attracting some of these bright young people; during the convocation last fall, one said, “I have always been focused on studying engineering, and it’s great to be able to do it at NYU now.”

The Class of 2017 is also impressive in its diversity; its members are proof of our continued commitment to underrepresented minorities, financially and racially, and of others who might not previously have considered a career in a STEM-related field as a possibility. An incredible 40% of our incoming undergraduates are the first in their immediate families to attend college, and an even greater percentage—more than half of the class—receive need-based federal Pell Grants. According to Payscale.com, which ranked us among the top-ten schools in the country this year, we are providing these students with a solid path to successful careers. To walk around the MetroTech Commons in Downtown Brooklyn is to see a microcosm of the City, indeed the world: a tenth of the freshman class hails from outside of the U.S. with almost 20 countries—from Taiwan and Turkey to Kenya and Kuwait represented. African American and Hispanic students make up a fifth of the freshman class, and women account for a quarter—strong numbers for an engineering school and very good news for the engineering profession as a whole. We aim to do better and better.

The incoming class thus exemplifies the distinctive blend of excellence and diversity that is a traditional hallmark of the School of Engineering. What awaits them now, you might wonder. They will take rigorous classes and labs with some of the most respected professors in their fields, among them Maurizio Porfiri and Justin Cappos, both of whom have been placed by the editors of Popular Science on the “Brilliant 10” list of the most visionary scientists in the nation; they will take part in our many student competitions, some spearheaded by themselves, some by other NYU schools; undertake internships at our renowned incubators; and experience a new culture by studying abroad.

The merger with NYU has opened up myriad cross-discipline collaborative learning and research opportunities, and I trust that I will see many members of the Class of 2017 studying at the new multi-school Media and Games Network, working alongside the engineering professors who have won seed grants for cross-institutional research projects with colleagues from others schools, and attending events in Washington Square.

Over the next few years, I am looking forward to interacting with all of you, and hope you have the chance to visit the campus to meet some of us directly. You will be pleased to see the progress we have been making. Our alumni have always served as powerful and inspiring role models for our current students, and you might find in some of them your own younger images.

Sincerely,

Katepalli Sreenivasan
**LETTER FROM THE PIAA PRESIDENT**

Dear Fellow Alumni,

Thank you for your support in electing me President of the Polytechnic Institute Alumni Association (PIAA). It is an honor for me to lead this distinguished and diverse group of more than 33,000 alumni from around the world.

I am certain that—like me—you all have many fond memories of your days here, and I know you share my pride in our great alma mater, which continues to be an academic leader at home in New York, in the country, and in the world.

Perhaps you have read in the national media of our ever-growing stature. We were recently voted among the top engineering schools in the country by PayScale; the editors of U.S. News & World Report ranked our online graduate engineering program one of the best around; and Worth magazine deemed our incubators to be one of the nation’s “Top 10 Idea Labs.” Those are just a few of the accolades that we have garnered this year, and I’m confident that there are many more to come.

I’m assuming leadership at an exciting time in our history. The long-anticipated merger with NYU was finalized on January 1, 2014. Along with a name change—to the New York University Polytechnic School of Engineering—the merger brings with it a wealth of new services and benefits for you, and I hope that you will take advantage of them as they are made available.

One thing will never change, however. We will continue to provide opportunities to students from a wide range of backgrounds, including those new to these shores and those who are the first in their families to gain a higher education. We will continue to provide them with the skills and knowledge they need to benefit society and make a difference in the world.

Please join me and the other dedicated members of the PIAA as we support our school, which has long been a beacon of excellence and diversity, in that noble mission.

Fittingly, the theme of this issue of Cable is “collaboration.” It takes many people working together to make an institution great and keep it vital. Our wonderful faculty members and staff certainly do their part, and we, as alumni, can help immeasurably as well.

With the new leadership team finalized and committee chairs appointed, I urge you to become involved in the PIAA. Volunteer to serve as a mentor to an eager student, provide an internship, or make a gift to one of our scholarship funds—there are many deeply gratifying ways to lend a hand.

We welcome your thoughts and suggestions about how we can continually improve our organization. Please feel free to contact us at alumni@poly.edu.

My life has been enriched immeasurably by my connection to my alma mater, and I’m sure that many of you would say the same. Only with your individual and collective help, can our alumni association ensure that a new generation of aspiring engineers will be equally enriched.

I recently had the honor of addressing the Class of 2017 at their convocation. As I gazed out at more than 600 eager, young faces, I saw the same hunger for knowledge and drive to change the world that we have all evinced. We must remain committed to helping our current students satisfy that hunger for knowledge, and we must encourage their drive to be innovators, inventors and entrepreneurs. Just as previous generations of devoted alumni extended their support to us, we must do the same for them.

Warm Regards,

Gerald W. Dawes

‘84EE ’89EE

PIAA President

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Eric Levenstein ’66EE, ’87TN, ’03 MBA
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CHAPTER AND VERSE

When the Office of Alumni Relations joins with the alumni association to host a large event at our school, it can be thrilling to be among the throngs, visiting with scores of classmates and seeing which classrooms and labs have been refurbished since your student days.

But it’s not always possible to travel to Brooklyn if you live and work outside of the city, and sometimes it’s nice to be part of a smaller, more intimate group.

The NYU Polytechnic School of Engineering’s dedicated alumni-relations staffers plan as many regional gatherings as possible, and while those are always fun, they don’t take place as frequently as many alumni would like.

Why not consider starting or joining a regional chapter? The alumni association is seeking to revitalize its local groups, and many members are stepping up to help organize.

South Florida is already home to a regional chapter headed by Jay Bluestein (’66) and Mel Weinzimer (’67), who have organized past events and look forward to hosting more, including, perhaps, a sightseeing tour of the picturesque Intercostal Highway and a pro baseball game. They assert that the benefits of a strong regional chapter go well beyond the social, however. When the two were working at tech giant Raytheon, they arranged for recruiting events for the students, for example. “Staying involved ensures that we can contribute to our school—and not just financially,” they say. “And contributing to our school is, in a very meaningful way, contributing to society.”

Gary Ogin (’69), who attended a lively NYU-hosted alumni dinner this past spring, agrees and hopes to help establish an active chapter in his current home city of Denver. “At school I was surrounded by like-minded ‘geeks,’ back in the day before geek was cool,” he says. “My participation in the alumni association will hopefully provide an opportunity to stay in touch with the many like-minded members of the alumni community who have settled in the Denver area.”

Steve Garone (’73) and his wife, Lynne (’75), met more than four decades ago while they were both attending the school, so they are familiar with the benefits of getting to know your classmates. They recognize the value of fostering their connection to the school and were active in the Boston-area Bean Pot chapter, which they hope to see re-energized soon. “Having been involved with the Alumni Association for many years, I have concluded that the greatest value the Alumni Association can provide is help, knowledge, and expertise in areas important to the careers and lives of the alumni,” Steve says. “And regional social events [can be] great venues for updating alumni on the status of the school and its programs. That’s the way to keep alumni engaged.”

Bob Franco (’69) remembers when the Houston-area chapter planned several wonderful events. “I offered my home to host meetings, and my wife and I were the catalyst behind having
an alumni group outing to see the traveling Broadway series show *Rent,*” he recalls “Another alumnus, who was the technical director at NASA, arranged for a private tour of the NASA Space Shuttle and International Space Station facilities.... These activities were not held too frequently but were special occasions to me.” They were especially important because of the camaraderie they fostered. “We all met as strangers but were bonded by our experiences at our alma mater,” Franco, who is helping spearhead a revitalization of the Houston chapter, says. He hopes that the group will foster the same camaraderie as in its previous incarnation, with one important difference: “The demographics of the last alumni chapter group was semi- or fully retired, and male. That reflected the absence of women and minorities from the engineering disciplines at that time,” he explains. “Today, I’m hoping to attract a younger, more diverse, group to our events, one that reflects the school as it is now.”

Alumnus Charlie Hinkaty (’70, ’72), who sits on the boards of both NYU and the School of Engineering, served as president of the alumni association and chairman of what was then its newly created International Board of Directors from 1996 to 1998. “Perhaps the most important initiative I pursued during my tenure was the creation of Alumni Chapters in key locations domestically and internationally, as part of our effort to rekindle a relationship between our distinguished Alumni and our Alma Mater,” he recalls. “We were successful in establishing vibrant chapters in New York, Long Island, Washington, Houston, California, Taiwan, Japan, Korea, and Israel, among other locales. In view of the exciting renaissance currently underway as we merge with NYU, this is the ideal time to re-establish regional chapters that may have lost their momentum, as well as other, new chapters.”

“Leading a chapter can be a fun and rewarding experience for alumni,” Valerie Cabral, the Director of Alumni Relations, says. “We love sponsoring events, and it’s very gratifying to know that we’re helping alumni connect. When our regional chapters take the reins to plan and host gatherings, it’s a way of nurturing those connections and keeping the momentum going throughout the entire year.”

If you’re interested in starting or reinvigorating a local chapter, contact Alumni Relations Officer Rena Rutkovsky at rena.rutkovsky@nyu.edu or 718-260-3844.

**Polytechnic alumnus Frank J. Novak ’69 was delighted to accept NYU President John Sexton’s invitation to serve as his delegate at the inauguration of Steven R. DiSalvo, president of Saint Anselm College, in Manchester, NH. Mr. Novak was selected in honor of his 31 years of consistent and generous contributions to his alma mater.**
There are probably very few of us eager to seriously contemplate the end of our lives and or think of the prospect of leaving behind people and places important to us. But we all know that it behooves us to do some type of advance planning, whether that entails making a simple will, setting up a trust, or arranging charitable annuities.

Members of one very special group of alumni have named their alma mater as a beneficiary in their wills, trusts, retirement accounts, and life insurance policies—not only making a savvy estate planning decision but benefiting the school that they love and that put them on the path to success.

That group, the Samuel B. Duryea Society, was created in 1990 and was named after Samuel Bowne Duryea (1845–1892), a former student who was the first ever to make a bequest to the school. That generous gift was made in 1885, and in the years that have followed many other devoted graduates have followed in his footsteps.

Gerry Liebling, who earned a B.S. in chemistry in 1959, had a long and distinguished career at General Electric and remained with the aerospace division even after it was sold to Martin Marietta and later came under the umbrella of the merged Lockheed Martin. Throughout those mergers and acquisitions, Liebling, who was posted to several exotic locales, including Micronesia, during his tenure, held onto the GE stock he had been awarded. It had appreciated and would be subject to hefty capital gains taxes, he knew.

Liebling discovered that an ideal solution would be to create what is called a charitable remainder trust and fund it with the stock; he had only to decide what organization would be the beneficiary. His thoughts turned to his alma mater. “I have had a very good career, but I didn’t create it on my own,” he explains. “The school was instrumental in helping me and I knew that this would be a good way to repay it for its part in my success.”

That same mix of pragmatism and emotion also motivated Charlie Hinkaty (’70, ’72). He completed college, he says, only with the help of scholarships, because his father died shortly before his sophomore year. He wants to provide similar aid to students in the same straits.

“Joining the Duryea Society was an easy choice,” he asserts. “The school ultimately prepared me for what was a long, fruitful career at Procter and Gamble, Bristol-Myers Squibb and Del Labs. It even had a big effect on my personal life, because I met my wife of more than four decades while on a leadership conference I attended as a student. Of course, I want to give back.”

Norbert Bikales (’56, ’61), who plans to leave the remaining funds in his IRA retirement plan to the school, recently attended a luncheon for members of the Society, and he hopes to see future events crowded with even more donors. Still, his favorite guests were the students who had benefitted from the Duryea Society’s support. “They were very impressive,” he says enthusiastically. “It’s wonderful to see them getting the opportunity to develop their talents even further, and it will be exciting to see what their future holds.”

To learn more about how you can join the Duryea Society and other options for giving, visit http://engineering.nyu.edu/alumni/planned-giving/duryea-society
A RICH HISTORY OF ENGINEERING AT NYU

When Richard Thorsen looks to the future of engineering at NYU, he could be forgiven for feeling a twinge of déjà vu. Back in the fall of 1972, Thorsen was teaching at his alma mater when he got the troubling news that NYU would be selling off its University Heights campus in the Bronx—and with that, relocating or even closing the school where he’d worked since 1964 as an instructor and earned his PhD in 1967.

A mechanical engineer whose doctoral research at NYU had focused on swirl-flow turbulent heat transfer, Thorsen suddenly found himself involved in contentious negotiations over what would happen to NYU’s School of Engineering and Science. When it eventually merged with the Polytechnic Institute of Brooklyn, which took the new name Polytechnic Institute of New York in 1973, he was one of many faculty members to make the move across the river. The institution where Thorsen had taught and earned his doctorate had officially vanished, but he and other Bronx transplants would carry the spirit of NYU engineering forward.

In his 40 years here, Thorsen has served at various times as associate provost for computing and information systems, dean of graduate studies, vice president for research and advanced programs, vice president of development and university relations, and vice president for student affairs. Today, as head of the department of mechanical and aerospace engineering, vice president emeritus, and de facto custodian of Poly’s complex history with NYU, Thorsen is in a unique position to reflect on major milestones at both institutions, and on the mergers that have tied them together.

He recently sat down with NYU Stories in his MetroTech Center office.

Was it a shock to learn that the Heights campus was closing?

Like many people, I felt sad when the Heights campus was sold off, but you get over it. The Heights experience had been very pleasant. From a campus point of view, it was a very enjoyable location. The facilities were good, the faculty were good—so what’s not to like?

At one point, the University considered moving engineering to Washington Square, right?

That’s when things got interesting! In higher education, there’s a certain competitiveness between schools. You’re competing for various kinds of resources. Poly said, “It isn’t in our interest to have an engineering school comparable in size, mission, and quality so close to us. We’ll be draining each other of limited resources.” And both NYU and Poly were experiencing financial difficulties at the time.

So what happened then?

Poly was in a very strong political position at the time, because it was in the district of Stanley Steingut, the speaker of the New York State Assembly. Poly enlisted him as an ally to block the transaction of NYU selling the Heights campus if they were going to move the engineering school to Washington Square, and that’s when the political hardball began. NYU said, “If you do that, we’ll persuade the legislature to stop the state aid that Poly is getting.” The state then essentially put a gun to the head of both schools and said, “You shall merge.”

Sounds like a tumultuous beginning to a partnership.

The merger was effected in a rather short period of time—about a year and a half, compared to what happened since 2008, which has been a five-year, or if you count the period of negotiating in 2007, more like a six-year process. It’s sometimes referred to as a shotgun wedding. I don’t think that’s a fair characterization, as a great deal of thought and effort went into doing it as well as possible at the
time, though there was political pressure to make it happen.

As a former NYU professor, did you feel welcome at Poly after the merger? There was absolutely no rivalry, bitterness, or jealousy among the faculty. In about two years, you really had to stop and think: Who came from Brooklyn, and who came from the Heights? We blended very, very quickly.

Has the transition since 2008 been as smooth? That’s an apples-and-oranges comparison, because in 1973 there were only two schools involved—NYU School of Engineering and Poly—and when they came together they were roughly equal in size. NYU is a federation of many schools, and today Poly is just one of them. Many faculty have welcomed opportunities to explore relationships, and interactions have taken place between Poly, the Wagner School, the medical school, the dental school, Courant, and so on. So it’s been very cordial on that level, but you can’t expect the complete blending we had in 1973, because the situation is so different.

Is there a sense that Poly’s been swallowed up by NYU? Let me say something a little impolitic. For most of the time that NYU and Poly have coexisted, particularly in the 20th century up to the 1970s, Poly was more highly regarded than NYU, in terms of reputation, prestige, and perception of quality. Of course, since then, NYU has made great strides, in my opinion. But older alumni may have this frozen image of Poly being the better place, and so they see NYU as the bigger giant swallowing it up. I like to think that we, Poly, can bring changes to NYU that will continue to improve it. It’s a win-win.

Poly faculty, students, and alumni have been responsible for so many important breakthroughs and discoveries over the years. What are the standouts, in your mind? Where to begin? A case can be made in a very real sense that Eugene Kleiner, a 1948 graduate of Poly, is the father of Silicon Valley. With a few other people he developed the first integrated circuits, and then went on to form the venture capital firm Kleiner, Perkins, Caulfield, Byers, which provided venture capital to more than 50% of companies in Silicon Valley. Then there’s Gordon Gould, who was on the faculty of Poly, and did much of the work in the development of the laser—an invention that pervades so many other technologies today. And, going back a little bit earlier, one who makes me feel good in a different way is Jasper Kane, who graduated from Poly in 1928 and worked at Pfizer prior to World War II. Penicillin had already been discovered, but it was made in a painfully slow process. Kane figured out how to mass-produce it, which is credited with saving over a million lives of soldiers and civilians during the war.

Maybe the most important one is Poly alumnus Joe Owades, who patented light beer. That’s the one the students like. But I’m hopeful going forward that some of our graduates will go on to great things, too.

How has engineering education changed in the 40 years you’ve been at Poly? I’ve heard a joke that goes, if you took somebody from the Middle Ages and took him to Times Square, he’d be incredibly disoriented. But if you took a college professor from the Middle Ages and you transported him to a classroom today, he would feel right at home! That’s a way of saying that the way that education is delivered hasn’t changed that much in hundreds of years. That’s an overstatement, and we, like so many other schools, have made important strides in introducing technology into the classroom, and it’s aided the learning process. But in the academic world these changes occur rather slowly.

Now, unquestionably, the content of what we teach has changed. Nanotechnology didn’t exist 40 years ago in any recognizable form. Bioengineering, biotechnology and the interplay between science, engineering, and the medical profession was in its infancy back then. Prior to the infusion of computers into the educational process, the image of an engineer was a guy carrying a slide rule wherever he went! And it was definitely a guy, because there weren’t very many women in engineering.

Is the engineering field more diverse today? In later years, engineering has been very proactive in trying to engage women and minorities, with some success, but not as much success as many of us would like. But back when I was a student at the Heights, then there wasn’t even that proactiveness in trying to recruit such students, and you didn’t have the diversity that we currently have, and which I think is healthy. Still, it doesn’t make me happy, being the father of four daughters and six granddaughters, that engineering even today is such a male-dominated profession.

Having started your career at the Heights and now officially returning to NYU, do you feel that things have come full circle? Well, there’s an institutional journey and there’s a personal journey. On a personal level, I feel that way in some sense, though institutionally it’s a little hard to say. There are very few people remaining at Poly who were here in 1973 as a result of that merger, so the institution has changed and therefore not quite come full circle.

But on a personal level I like to think that this is not a merger, but the returning of engineering to NYU, after engineering was in Poly’s safekeeping for 40 years.

—Eileen Reynolds
Dear Alumni Association of the Polytechnic Institute of NYU,

In light of the completed merger between NYU and the Polytechnic Institute of NYU on January 1, 2014, it is my pleasure to welcome all members of the PIAA to the NYU Alumni Association!

In welcoming NYU-Poly alumni to our vibrant global community, the NYUAA will represent a combined group of more than 470,000 alumni living and working around the world. We are honored and privileged to welcome the talented NYU-Poly alumni to this group, and are excited to see what this larger, more dynamic community can accomplish.

As part of this official welcome, I have formally invited two members of PIAA leadership, Gerald Dawes and Josiane Arbouet, to standing positions on the NYUAA Board of Directors, pending membership conditions as outlined in our by-laws. The Board meets four times per year and is the governing body of the University-wide Alumni Association. We would also welcome other PIAA members to apply for membership on the Board as well.

The NYUAA’s mission is to build and sustain a lifelong relationship between the University and its alumni through communications, programs, services, and volunteer opportunities. We hope that we will see many PIAA members at these upcoming signature University alumni events:

- **NYUAA Awards Luncheon**, Thursday, April 24, 2014
- **NYU Alumni Day**, Saturday, November 8th, 2014

In closing, I look forward to the collaboration of the NYUAA and the PIAA in the months and years to come.

Sincerely,

Phyllis Putter Barasch (STERN ’81)
President, NYU Alumni Association

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**BEYOND YOUR BASIC BENEFITS**

Our alumni know that belonging to the Polytechnic Institute Alumni Association (PIAA) has had its rewards

We hope that you are already sampling:

- A variety of alumni events
- Career services
- Discounts on theater tickets, restaurants and more
- Great publications like Cable
- Great rates on car and home insurance
- Group health and life insurance
- Opportunities for continuing education

We’re proud to have been able to offer all this, and now, we have even more reason to be proud, because as members of the NYU alumni family, you are eligible to enjoy a host of other great benefits! Brian Perillo, Associate Vice President of Alumni Relations at NYU, says, “Benefits and Services are an important part of how we connect with our alumni. Being able to offer them special access and useful discounts is our way of letting the alumni know they are a valued, important part of our NYU community, even long after they graduate.”

Now take advantage of:

- Even more great discounts and entertainment options
- Access to NYU clubs, libraries, and other facilities
- Affordable memberships to well-equipped gyms
- Exciting travel opportunities that will show you why NYU is considered a Global Network University

Be sure to visit alumni.nyu.edu/benefits for more info on all the benefits available to you, including a lifetime NYU email; hotel and rental car discounts; access to NYU’s e-Library; and more. It’s fun and beneficial to be a part of the NYU alumni family. Enjoy!

For more information or questions about alumni matters, contact Valerie Cabral, Director of Alumni Relations, NYU Polytechnic School of Engineering at valerie.cabral@nyu.edu. For specific questions regarding your alumni benefits and services, feel free to contact the NYU Office of Alumni Relations at alumni.info@nyu.edu, or call (212) 998-6912.
SHOWING SOME VIOLET PRIDE AT NYU

When New York University President John Sexton promised grads that during Alumni Day, held this year on October 19, they would “hear from some of our outstanding faculty on [their] cutting-edge research,” two professors helped him make good on that pledge: Associate Professor Maurizio Porfiri led a demonstration of the Bio-Mechatronics of a Robotic Fish’s Anatomy, encouraging alumni to control one of his robotic fish with their iPhones, and Professor Vikram Kapila taught the nuts, volts, and bits of robots.

Alums had ample opportunity during the jam-packed day to mingle with their almost 1,400 counterparts from other NYU schools, but the luncheon was a more intimate affair, hosted by NYU Dean of Engineering Katepalli Sreenivasan. During his address, Sreenivasan reminded the guests of the school’s rich history, while encouraging them to look to the future and all the benefits that the merger with NYU is bringing. “Our students and professors are taking advantage of exciting new possibilities for collaborative research, increased course offerings, and study abroad,” he explained, “and we intend to climb steadily in the rankings.” The NYU Polytechnic School of Engineering, he asserted, was on track to become a world-class institution in the fields of Urban Systems, Information Technology and Media, and Bioengineering, thanks in part to collaborations with Tisch, Steinhardt, Wagner, and other NYU schools.

At the luncheon, during which Professor Kapila treated the alumni to an encore robotics presentation, the Distinguished Alumnus Award was given to Ahmad Rahimian (‘80, ‘86), the CEO of WSP Cantor Seinuk, a multinational structural-engineering firm. Widely acknowledged as one of the world’s foremost authorities on tall buildings, Rahimian is known for his innovative designs for high-rise residential and commercial buildings, as well as sport facilities and special structures. “I am truly honored to be recognized with this award,” Rahimian said. “It is indeed a privilege just to be considered. My years of association with the school, first as a graduate student and then as an adjunct faculty member, has been extremely rewarding beyond my imagination.” He continued, “What made the difference for me was not only the high caliber of the accomplished professors and curriculum, but the tremendous value of what I learned from our genuine one-on-one discussions and collaborations that took place over those years. Particularly, I always cherish my time spent with my doctoral advisor, Professor P.C. Wang.”

The previous night, Neil Weiser (‘73) had received the Dedicated Alumnus Award, for his service to the Polytechnic Institute Alumni Association (PIAA). Weiser, the vice president of the PIAA, has sat on multiple committees, including those devoted to bylaws and audits. Asked if those assignments might be characterized as thankless, he good-naturedly disagreed. “Bylaws might not sound like the most exciting things in the world,” he said, “but it’s gratifying to be doing something important for the PIAA and for my alma mater.”
Alums and their families gathered at the 2013 Alumni Family Day at the New York Hall of Science last March. The day provided a chance for alumni to celebrate science and introduce their former classmates to their family members.
Just this past summer the NYU Polytechnic School of Engineering launched #STEMNOW—an array of programs for teachers and middle and high school students, that included the Science of Smart Cities (SoSC), a program that introduces STEM concepts to middle school students through hands-on activities, demonstrations, and experiments. This effort built on 10 years of work by NYU Polytechnic School of Engineering faculty, graduate and undergraduate students in providing high-quality, hands-on STEM education programs.

Piloted in July 2012, the 100-hour SoSC’s curriculum is divided into four modules, which cover energy, urban infrastructure, transportation, and wireless communications. Through teamwork and mentorship by NYU School of Engineering student instructors, participants connect with the urban environment in which they live and learn the science, engineering and technology that builds and designs more livable, efficient, sustainable, and resilient cities.

SoSC has taken on an international dimension. In partnership with the New York Academy of Sciences, the Center for K12 STEM Education was engaged by the Education Faculty at the National University of Malaysia (Universiti Kebangsaan Malaysia or UKM) to design a set of curricula based on Smart Cities that introduces STEM concepts and hands-on activities to Malaysian youth and educators. This new project is known as the Science of Smart Communities, or by its Malay name, Bitara STEM.

The Bitara STEM curriculum is composed of the same four modules as SoSC but subject areas are adapted to a Malaysian and international context. In September, a team of 4 from the Center traveled to UKM and trained 32 education school graduate students, graduate students from various STEM disciples, and practicing teachers in the first module covering energy. The team and newly trained STEM educators then worked over 3 days with 90 13- and 14-year old Malaysian students to instruct the module; conduct the activities, demonstrations and experiments; and create a student-led STEM exposition of the work on UKM’s campus.

Youngsu Cha, a Ph.D. student at NYU School of Engineering involved in this program, said of the experience, “The students and teachers learned from
Students from the NYU School of Engineering worked with students and faculty last summer in Malaysia during the launch of Science of Smart Communities or Bitara STEM and I learned from them. We felt that we had challenges to solve, and we solved those together.”

For the development and delivery of the modified module on energy, the Center worked with NYU Professor Maurizio Porfiri and two PhD candidates in his Dynamical Systems Lab, Cha and Flavia Tauro. Domminck Dennisur (ME, 2013) is managing the project for the Center. For the next three modules, the Center will engage relevant faculty and their students in modifying and adapting the SoSC curriculum, and this group will travel again to Malaysia to deliver training.

Ben Esner, director of the Center for K12 STEM Education, said, “This is an exciting project for us. It is so important to work with UKM’s education faculty and its scientists to broaden the experience of their students to include curricular approaches, ideas and techniques for innovative, hands-on STEM education practices and programs. I’m tremendously proud of the team: they prepared well, traveled to the other side of the world, worked very hard and met great success.”
Shivendra Panwar, professor of electrical and computer engineering, has developed a new technique called streamloading. The patent-pending technology is set to eliminate streaming problems, such as buffering and spinning cursors, forever.

While traditional streaming downloads 30 to 60 seconds of video ahead of time as video quality and speed vary based on wireless signal strength, streamloading splits video streaming into two layers – a base layer, which contains a rough representation of the video, and an enhanced layer, which completes the image quality including fine detailing. This allows users to download the enhanced layer onto their devices in a location where the wireless signal is strong and stream only the base layer at the time of viewing.

Professor Panwar estimates that the technique could remove as much as 75 percent of the streaming content from wireless networks and reduce data usage for consumers.

**SMarter Streaming**

**Professor Stephen Arnold applies breakthrough method to cancer detection**

Just months after setting a record for detecting the smallest virus in solution, Professor Stephen Arnold and his researchers have announced another defining breakthrough. They detected a single cancer marker protein. The marker protein, which was one-sixth the size of the smallest virus, sets new limits on detection sensitivity. Their method, a nano-enhanced version of their microcavity biosensor, may improve early disease diagnostics.

In 2012, Arnold and his team were able to detect in solution the smallest known RNA virus, MS2, with a mass of 6 attograms. Now, with experimental work by postdoctoral fellow Venkata Dantham and former student David Keng, two proteins have been detected: a human cancer marker protein called Thyroglobulin, with a mass of just 1 attogram, and the bovine form of a common plasma protein, serum albumin, with a far smaller mass of 0.11 attogram. “An attogram is a millionth of a millionth of a millionth of a gram,” said Arnold, “and we believe that our new limit of detection may be smaller than 0.01 attogram.”

This latest milestone builds on a technique pioneered by Arnold and collaborators from NYU Polytechnic School of Engineering and Fordham University. In 2012, the researchers set the first sizing record by treating a novel biosensor with plasmonic gold nano-receptors, enhancing the electric field of the sensor and allowing even the smallest shifts in resonant frequency to be detected. Their plan was to design a medical diagnostic device capable of identifying a single virus particle in a point-of-care setting, without the use of special assay preparations.

At the time, the notion of detecting a single protein—phenomenally smaller than a virus—was set forth as the ultimate goal.

The method, named “whispering gallery-mode biosensing” uses a laser which emits light through a glass fiber to a detector. If a microphone is placed against the fiber, specific wavelengths of light detour into the gold nanosphere. The light trapped in the sample decreases the amount of light received by the detector. Once a cancer marker is introduced into the sphere, the resonant frequency shifts markedly. This allows a researcher to conclude, from the shift in frequency what marker is being detected by the biosensor. Unlike traditional methods, which attach fluorescent molecules, also known as labels, to antigens for detection, Arnold’s method allows antigen detection without labels.

The implications of single protein detection are significant and may lay the foundation for improved medical therapeutics. Professor Arnold and his colleagues believe the ability to follow a marker in real time using the biosensing technique will yield groundbreaking understanding of how proteins attach to antibodies. Professor Arnold, in a partnership with Professor Xudong Fan (University of Michigan), has been awarded $200,000 through a new NSF grant to support the construction of a multiplexed array of plasmonically enhanced resonators, which should allow a variety of proteins to be identified in a blood serum within minutes.
A little over a year after Superstorm Sandy battered the East Coast, New York State Governor Cuomo announced the launch of the New York State Resilience Institute for Storms & Emergencies (NYS RISE) at the Governor’s Conference on Emergency Preparedness.

The institute is housed jointly at the NYU Polytechnic School of Engineering and Stony Brook University on Long Island. The new center will apply the expertise available at New York’s top universities to aid the state, local communities, and first responders in their preparation and response to extreme weather as well to ensure long-term resilience.

The center will undertake research including cause-and-effect mechanisms for damage to infrastructure, evaluating existing assessments of vulnerabilities of communities and critical facilities, and extrapolating storm risks from climate change conditions. The research will be undertaken cooperatively and collaboratively with agencies of New York State as well as local government and communities.

Professor Fletcher (Bud) Griffis of NYU School of Engineering’s Department of Civil and Urban Engineering will serve as co-director of NYS RISE, with Dr. Minghua Zhang of Stony Brook. They will be joined by faculty at Columbia University, Cornell University, Brookhaven National Lab, and the City University of New York.

“We are proud to be a partner of this public-private project that will serve as a hub of research and education on coastal preparedness and sustainability,” said Dr. Katepalli Sreenivasan, NYU Dean of Engineering. “At a time when New York has truly felt the devastating effects of extreme weather conditions, the New York State Resilience Institute for Storms & Emergencies will help prepare our region for climate change in the long term and bring us closer to becoming a hurricane- and flood-resilient city.”

“This initiative is unprecedented in the history of disaster recovery in the nation,” said Kurt H. Becker, NYU School of Engineering’s associate provost for research and technology initiatives. “NYRISE will support agencies and communities, as well as push the bounds of knowledge, both to ensure that New York will recover more intelligently and more sustainably for the long-term future, as well as to share that knowledge with the numerous people around the world facing similar challenges.”

Additional NYU faculty who will be involved in NYS RISE include Professor Francisco de Leon, NYU School of Engineering Department of Electrical and Computer Engineering; Professor Masoud Ghandehari, NYU School of Engineering Department of Civil and Urban Engineering; Professor David Holland, NYU Courant Institute of Mathematical Sciences; Professor Kaan Ozbay, NYU School of Engineering’s Department of Civil and Urban Engineering; Professor Rae Zimmerman, NYU Robert F. Wagner Graduate School of Public Service; Dr. Stephan Bless, NYU School of Engineering’s Department of Civil and Urban Engineering; Professor Haralambos “Bob” Vasiliadis, NYU School of Engineering’s Department of Civil and Urban Engineering; and Dr. Constantine Kontokosta, NYU Center for Urban Science and Progress.

MAGNET OPENS IN BROOKLYN

Representatives from all the schools were present on October 8, to cut the ribbon and open the Media and Games Network (MAGNET) to the academic community. Addressing the gathering, NYU Provost David McLaughlin asserted that MAGNET was setting new standards for interschool collaboration and said, “What a great acronym—and a great metaphor, since we are literally drawing together faculty and students from different departments and even different boroughs.”

Bridging the gap between technology and culture, MAGNET co-locates NYU’s teaching and research programs in both game design and digital media design; games as a creative art form, computer science, and engineering. It brings under one roof faculty and students from NYU School of Engineering; the Steinhardt School of Culture, Education, and Human Development; the Tisch School of the Arts; and the Courant Institute of Mathematical Sciences.
Justin Cappos joins an elite group of ten young researchers named by Popular Science magazine as this year’s “Brilliant 10.” For the past 12 years, Popular Science has been searching out the nation’s most promising researchers under age 40 and profiling them in the magazine’s annual “Brilliant 10” issue, on newsstands and at popsCi.com.

Cappos, an assistant professor of computer science and engineering, was recognized primarily for his work on Seattle, a free, open-source cloud computing system that allows anyone to experience the Internet from the perspective of any location around the globe. Although some users employ Seattle for content distribution or to circumvent censorship, it also provides a safe platform for students to experiment with cybersecurity, mobile devices, and the web. A dozen universities around the world have already used Seattle in 45 classes, mainly to study networking and cybersecurity.

Seattle permits access to resources that exist in any network, anywhere—it presents the Internet not as a specific ISP or government would have users experience it, but as it exists in any location in the world. For example, a student in China whose access is restricted may use Seattle to circumvent censorship and see the same Internet that a student in Brooklyn would see, in real time.

“This isn’t a method of hacking into someone’s computer and controlling it,” explained Cappos, whose computer security background was essential in...
ensuring the safety of the system. “Instead, Seattle lets users see the Internet as if they were sitting at someone else’s computer.”

Seattle also runs on smart-phones, and its capabilities shine light into what is currently a blind field. “Nobody knows what goes on inside the roughly 1 billion smartphones in the world, or what the Internet would look like from, for example, an Android phone in Afghanistan,” said Cappos. Seattle can answer these questions and is the largest academic research testbed of its kind. It receives funding from the National Science Foundation (NSF).

This is the first time that a school the size of NYU Polytechnic School of Engineering has had two Brilliant 10 winners. Maurizio Porfiri, associate professor of aerospace and mechanical engineering and director of the NYU School of Engineering Dynamical Systems Lab, made the list in 2010 in recognition of his work with bio-inspired robots.

“Popular Science prides itself on revealing the innovations and ideas that are laying today’s groundwork for tomorrow’s breakthroughs, and the Brilliant 10 is one of the most exciting ways we do that,” said Jake Ward, editor in chief of Popular Science. “This collection of 10 brilliant young researchers is our chance to honor the most promising work—and the most hardworking people—in science and technology today.”

NYU School of Engineering’s Dean Katepalli R. Sreenivasan added his congratulations, saying, “Professor Cappos has demonstrated the potential for good that technology can bring to society. He has illustrated through his work with his students and throughout his research a strong commitment to protecting privacy, security, and improving our digital lives.

I congratulate him on being recognized as one of the top young engineers and scientists by Popular Science. It is an honor for Justin that brings pride to his colleagues and parents alike.”

Cappos, a faculty member of NYU WIRELESS, a research center for wireless research, computing, and medical applications; the Center for Interdisciplinary Studies in Security and Privacy at NYU; and NYC Media Lab; is already looking to the future with his other research, including NetCheck, a tool that determines the causes of failure in networked applications like Skype; the Cages project, which protects parts of a computer program from one another (thereby preventing a bug from accessing entire computers); PolyPassHash, a more secure way of storing passwords; and The Update Framework (TUF), which helps secure vulnerable software updates.

Popular Science magazine’s Brilliant 10 has long been regarded as a feeder list for other prestigious accolades; notably nearly a dozen previous scientists named to the list have subsequently been chosen for MacArthur Foundation “Genius” awards.

FRE GOES GLOBAL

U nder the direction of Charles Tapiero, the Department of Finance and Risk Engineering has been steadily expanding its global reach, nurturing a network of connections with such institutions as the University of Paris 1 / Panthéon-Sorbonne, Korea’s Ajou University, and the Institut des Hautes Études de Management (HEM) in Morocco.

That international scope is readily apparent in the line-up of speakers taking part in the 2013-14 Topfer Chair Lectures, a series of talks inaugurated by Tapiero in 2006 that has drawn luminaries from the worlds of business, finance, and academia.

Among this year’s speakers have been Oren Tapiero of the University of Paris 1, who spoke about dark pool and high frequency trading; Bouchra Rahmouni Benhida of Morocco’s ESCA Ecole de Management, whose topic was financial geopolitics and globalization; and Eckhard Platen, of Sydney’s University of Technology, whose talk was titled “The Benchmark Approach to Finance.”

The caliber of those offerings is contributing greatly to NYU’s status as a Global Network University and raising the NYU Polytechnic School of Engineering’s profile among economists and academicians. Members of the department are finding themselves much in demand around the world: Professor Tapiero recently delivered the keynote speech at the annual conference of the Association of African Business Schools, for example, while Professor Agnes Tourin spoke at the Third International Conference of the Financial Engineering and Banking Society, in Paris.

Tapiero plans to continue expanding his department’s reach and focus. “Past achievements are merely augmenting our future challenges,” he has said. “The last decades have seeded a transformation of finance. However, it requires accelerating financial innovation.... In our technological and financial perspective, we remain, as engineers, a work in progress.”
Two faculty members from the NYU Polytechnic School of Engineering, Juliana Freire, professor of computer science and engineering, and Thanasis Korakis, research assistant professor of electrical and computer engineering, are among the 100 university engineers and scientists from around the globe to receive the Google Faculty Research Awards—one-year grants supporting cutting-edge research in various disciplines of computer science and engineering.

With information provided by the NYC Taxi and Limousine Commission, Freire used data from more than 540 million taxi cab rides over a three-year period to create a prototype visual exploration system that enables scientists and lay people to analyze data involving time and location on a scale that is currently impossible. Taxi rides provide insight into many aspects of New York City, including identifying areas that are most popular at certain times of day and neighborhoods underserved by taxis. These can in turn be used to uncover economic activity, human behavior, and mobility patterns to better understand the dynamics of cities and ensure that their service needs are met.

Addressing the transference of data, Korakis is developing a solution for slow broadband performance. As broadband access and Wi-Fi technology have become ubiquitous, home wireless local networks (WLAN) have soared in popularity. The result
This year’s annual Lynford Lecture welcomed renowned computer scientist Judea Pearl in late fall on the NYU Polytechnic School of Engineering campus.

Pearl was the winner of the Association for Computer Machinery (ACM) A. M. Turing Award and is an alumnus of the NYU School of Engineering and currently a professor emeritus of computer science and statistics at UCLA. He also serves as the president of the Daniel Pearl Foundation, an organization founded in memory of his son, a Wall Street Journal reporter who was kidnapped and murdered by terrorists in Pakistan in early 2002.

Pearl, who spoke at this year’s lecture about the science of cause and effect, is widely lauded for building the representational and computational foundation for the processing of information under uncertainty, and his studies have not only revolutionized the field of artificial intelligence, but have also become an important tool for many other branches of engineering and the natural sciences.

“Though it is basic to human thought, causality is a notion shrouded in mystery, controversy, and caution, because scientists and philosophers have had difficulties defining when one event truly causes another,” Pearl has said. “We all understand that the rooster’s crow does not cause the sun to rise, but even this simple fact cannot easily be translated into a mathematical equation.”

This year’s lecture also featured a panel discussion moderated by Jeffrey Lynford, which included Professor Katherine Isbister of the NYU Game Center and the Computer Science Department as well as Dr. Katepalli R. Sreenivasan, Dean of Engineering at NYU.

The lecture series, now in its 15th year, was made possible by the generosity of Tondra and Jeffrey Lynford and by the Institute for Mathematics and Advanced Supercomputing (IMAS).
Kristen Casano once had long black hair that was healthy and lustrous enough to be featured in a shampoo commercial, but she’s now sporting a shorter new style; the Student Council Treasurer of Clubs & Organizations participated in the program Pantene Beautiful Lengths, cutting her hair and donating it to help make wigs for women losing their own hair because of chemotherapy. “Growing out your hair to meet the requirements of the program requires both time and patience,” she says. “But the thought of helping a woman battling cancer is awe-inspiring to me.”

Beautiful Lengths was just one of the programs Casano championed during Breast Cancer Awareness Month in October. Drawing on the NYU School of Engineering focus on invention, innovation, and entrepreneurship—i2e—Casano coined the name Beli²eve for her campus-wide campaign.

She organized a contingent of dozens of students, faculty members, and staffers to take part in the “Making Strides Against Breast Cancer” walk in Central Park on October 20, and many appeared wearing T-shirts they had tie-dyed themselves at a gathering on October 18.

Casano also arranged for Industry Assistant Professor Matthew Campisi, who is deeply involved in developing innovative technologies for the early detection of breast cancer, to give a seminar on October 17. Campisi’s talk focused on the challenges of detecting and treating breast cancer in the developing world, where the mortality rate is extremely high.

“This is an area in which engineers can make an enormous difference,” he said. “I’m proud of Kristen for promoting awareness among aspiring engineers, some of whom may be inspired to tackle the problem one day.”

Casano and her fellow Student Council members ultimately raised $1,000 for the American Cancer Society, which estimates that one in eight women in the United States will be diagnosed with breast cancer at some time in their lives.
According to the editors, “the pioneering contributions of Financial and Risk Engineering Department compiled in recognition of Science: Essays in Honor of Models and Methods in Springer Publishing released in September 2013 and Banking Regulation. Socioeconomics systems—the complex behaviors of quantitatively researches a novel branch of physics that Size—which focused on a Econophysics of Wealth and Topics explored included the Iddo Eliazar of Israel’s Holon University of Cassino, and Sergio Bianchi of the Paris 1/Pantheon-Sorbonne, Guegan of the University of lecturers included Dominique Guegan of the University of Paris 1/Pantheon-Sorbonne, Sergio Bianchi of the University of Cassino, and Iddo Eliazar of Israel’s Holon Institute of Technology. Topics explored included the Econophysics of Wealth and Size—which focused on a novel branch of physics that quantitatively researches the complex behaviors of socioeconomics systems—and Banking Regulation. And in September 2013 Springer Publishing released Models and Methods in Economics and Management Science: Essays in Honor of Charles S. Tapiero, compiled in recognition of Financial and Risk Engineering Department Head Charles Tapiero’s pioneering contributions to his field. These include, according the editors, “the use of graph theory in the behavioral sciences, the modeling of advertising as a random walk, the resolution of stochastic zero-sum differential games, the modeling of quality control as a stochastic competitive game, and the development of impulsive control methods in management.”

Stephen Arnold, University Professor of Applied Physics and member of the Othmer-Jacobs Department of Chemical and Biomolecular Engineering, used a nano-enhanced version of his team’s patented microcavity biosensor to detect a single cancer marker protein, one-sixth the size of the smallest virus, and even smaller molecules below the mass of all known markers. This achievement sets a new benchmark for the most sensitive limit of detection and may significantly advance early disease diagnostics.

With the support of the National Science Foundation, Shivendra S. Panwar, Professor of Electrical and Computer Engineering, has developed a new technology called streamloading that promises to improve spotty wireless streaming and data-hogging downloads. The process uses a format that splits the video into two layers—a base layer, which contains a coarse representation of the video, and an enhancement layer; users pre-download the enhancement layer onto their devices in a location where the wireless signal is strong and stream only the base layer at the time of viewing.

Jin Kim Montclare, associate professor of chemical and molecular engineering, and Yingkai Zhang, associate professor of chemistry at NYU, have won a $1.2 million grant from the National Institutes of Health (NIH) to further a novel approach to understanding the genetic underpinnings of diseases including cancer and diabetes. The two have teamed to study the functioning of one of the key proteins in human DNA, called histone.

Assistant Professor Jonathan Viventi has helped design a small-diameter and low-profile wireless electrophysiology system that may someday replace larger ones that are implanted in the brain to detect neurological disorders. The system is designed around commercially available Bluetooth Low Energy components for low cost and ease of use.

There are few things more frustrating to an Internet user than interruptions or slow-downs in service. The complexity of the Internet “backbone,” as the principal routes between large, interconnected networks and routers are sometimes called, makes such occurrences virtually unavoidable, however. Huawei Technologies recently awarded H. Jonathan Chao and Kang Xi, researchers at the NYU Polytechnic School of Engineering High-Speed 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 help to ease the slowdowns.

The National Science Foundation recently announced that Associate Professor Sundee Rangan, Professor Eliza Erkip and Professor Theodore (Ted) Rappaport received a four-year, $1.2 million research grant to fund research into millimeter-wave picocellular networks, capable of handling magnitudes more data transmission than today’s networks. Additionally, the Intel Corporation awarded Rappaport and a Princeton collaborator $250,000 over three years in its “Beyond 4G” award competition.

Nikhil Gupta, an associate professor of mechanical engineering, has been selected as the recipient of the ASM International Silver Medal, which recognizes a career of distinguished contributions in the field of materials science and engineering and service to the profession. Gupta’s work focuses on lightweight materials with high damage tolerance for helmets, body armor and vehicle structures—research with enormous potential for making those products not only lighter but safer.

Richard E. Wener, a professor of environmental psychology in the Department of Technology, Culture and Society, has significantly furthered our ability to build more humane, just, and functional institutions, and his book, The Environmental Psychology of Prisons and Jails: Creating Humane Spaces in Secure Settings, is considered the seminal work on the topic. He was recently honored with the 2013 Environmental Design Research Association (EDRA) Career Award, in recognition of his substantial contributions to the discipline.
Crossroads of Collaboration

Through the collaborative efforts of CRISSP, the Grand Challenge, our incubators, the seed fund, study-away experiences, and educational innovations, NYU and the School of Engineering are on the precipice of an exciting metamorphosis. See how these efforts are bringing our new community together and encouraging the innovators and inventors of the future.
Innovation, Collaboration, Incubation

The figures are impressive. Since mid-2009, when the first one launched on Varick Street in partnership with the New York City Economic Development Corp., the NYU Incubators have created 900 jobs, generated more than $250 million in economic activity and contributed well over $30 million in local, state and federal tax revenue. The projections are even more remarkable. According to a recent economic impact study, by 2015 those numbers will have nearly tripled, with some 2,500 jobs created, $719 million generated and $92 million in tax revenue contributed.

The Incubators have been named among the Top 10 Idea Labs in the U.S. by Worth magazine and among the 20 best university business incubators in the world by UBI Index, a Sweden-based research initiative.

Still, facts, figures and lists tell only part of the story. A full account of NYU’s three business incubators—Varick Street, DUMBO, and New York Accelerator for a Clean and Renewable Economy (NYC ACRE), which relocated to a cutting-edge new space at NYU’s Brooklyn location—must include a look at the vibrant human elements. The continual brainstorming; the congenial collaboration among new entrepreneurs, mentors, faculty members and student interns; and the long hours and sweat equity untiringly accrued are all fundamental to the Incubators.

Whether a compa-
ny is creating Green Parking Zones that will make the city a cleaner and more sustainable place (like HEVO Power), intuitive and inviting healthcare-data solutions (like Mana Health), or any number of other innovative products and services, an NYU Incubator can help it grow.

Forging a Physician-Patient Partnership

“Data can save lives.” This simple statement is the principle that guides the work of Christopher Bradley and his team at Mana Health. "We believe that data-driven decision processing can make medicine work better, for [both] patients and clinicians," Bradley says.

The sheer volume of medical information produced on a single patient can be overwhelming, but Bradley and his team are finding ways to turn that raw data into information that can be “leveraged to increase the quality and efficiency of healthcare delivery” by organizing it in coherent and informative ways.

The company was recently awarded a contract to build the Patient Portal for New Yorkers, a website through which state residents will be able, starting in early 2014, to access their healthcare records safely and securely online. “New Yorkers do everything else online. It’s imperative that they also be able to access their healthcare data online, whenever they need it. This is the most important information a person has about him or herself,” says David Whitlinger, the executive director of the New York eHealth Collaborative, the agency that worked with the New York State Department of Health to choose Mana for the project.

Users whose clinicians participate in the program have ready access to their lab results, lists of medications, radiology reports, and other important information, making them true partners in their own healthcare.

Partnership and collaboration have long been important to Bradley, a native of Hawaii and the son of two physicians. After earning an undergraduate degree in neuroscience and cell biology from Rutgers University, he received a master’s degree in computer science from the NYU Polytechnic School of Engineering, where he and a group of fellow students began exploring the realm of health IT and realized that there was a great need for both patient engagement and clinical decision support. Together, they created a “Roadmap for Medical Care,” which employed a proprietary analytic engine that allowed physicians to gain new insights from patient records, improve diagnostic accuracy and make recordkeeping simpler. They entered their program in the University’s 2012 Inno/vention Competition and took first place.

Bradley named the newly formed company Mana Health, because in native Hawaiian, the word “mana” means healing energy. The thriving enterprise, which now counts entrepreneur Reggie Bradford as a board member and investor, is a graduate of the NYU Incubator, where, as Bradley explains, he received “a ton of support and resources” that helped him get his idea off the ground and into the marketplace faster.

Bradley is now combining his love of data analytics and healthcare to meet a practical, real-world need, and Mana Health stands as a prime example of innovation, collaboration and incubation in action.

Working Together to Alleviate Pain—at the Pump and the Plug

With the average price of gasoline hovering at close to four dollars a gallon, it’s easy to see why consumers often feel pain at the gas pump. Electric vehicles can help, but they come with their own set of headaches—mainly because there is little public infrastructure here in the U.S. to support their widespread use. There are now fewer than 1,000 plug-in recharging stations through-
out the country, resulting in what many observers are calling “range anxiety,” a fear that the vehicles will run out of power before reaching their destinations, leaving drivers and passengers stranded.

HEVO Power, a company that joined NYU’s NYC ACRE in 2012, is aiming to change that. HEVO (Hybrid and Electric Vehicle Optimization) is working to market an innovative way to power up electric vehicles wirelessly using electromagnetic resonant power—and it has the potential to cure the ills associated with plugging in, especially for commercial fleets and organizations like the military, which have been among the largest users of EVs thus far. Wireless charging could lead to the elimination of range anxiety, greater adoption of electric vehicles, and—as Jeremy McCool, the founder of the company and a decorated veteran of the Iraqi War, points out—eventual U.S. energy independence.

The HEVO Power Station (HPS) the company has created is a durable, easily installed device about the size of a manhole cover that can be embedded directly into pavement or asphalt. McCool envisions it being used ubiquitously in a wide variety of highly trafficked settings, including loading yards, parking lots and garages, commercial facilities, military installations, city streets and highways.

A Cleaner Future is Now Incubating

or years, NYU’s incubator system has been one of the most vibrant and forward-thinking in the country, but in 2014 it became even more so. That’s when the New York Accelerator for a Clean and Resilient Economy (NYC ACRE) moved to its new home at the aptly named Urban Future Lab in Downtown Brooklyn.

The Urban Future Lab has ample room for up to 20 start-up firms as well as a 2,000-square-foot exhibition space where tenants and others can showcase new technology. It also houses an area dedicated to panel discussions, classes and other opportunities for learning—including some programming from the NYU School of Engineering’s own Center for K-12 STEM Education.

Marshall Cox is the co-founder of Radiator Labs, an ACRE tenant that has developed a device that allows apartment dwellers to independently control the heat from their radiators, thereby saving energy and increasing comfort levels. He is particularly excited about the chance to exhibit his technology at the space, which is accessible to the public and features a rotating series of displays. “That will provide my company with great exposure,” he said. “The atmosphere at ACRE has always been accommodating, supportive and collaborative, but the new facility offers even more.”

Ryan Fant, a co-founder of Keen Home, which develops environmentally sensitive home-automation products, pointed out that the area devoted to educational programming is a great boon not only to the tenant companies but to the community as a whole. “Having enough room to allow numerous people to congregate, learning together and brainstorming, will foster some great initiatives,” he said.

ACRE had been seeded in 2009 by a four-year, $1.5 million grant from the New York State Energy Research and Development Authority (NYSERDA), an agency now joined by the New York City Economic Development Corporation (EDC) and major sponsor National Grid, which serves some 1.5 million utility customers throughout New York.

Those customers—and many others—will undoubtedly benefit from the work being done by the start-ups in the new incubator space, whose other tenants include VoltalQ, which develops software to make better-performing, longer-lasting energy devices; Enertiv, which creates and installs real-time energy monitoring systems and software; and Bandwagon, the creators of an easy-to-use ride-sharing app.

“The Urban Future Lab presents a terrific opportunity for NYU students and faculty to be at the forefront of engineering a more livable New York City,” Micah Kotch, Director of Innovation and Entrepreneurship, said. “And we expect New York City, with its one million buildings, to help us drive innovation on a massive scale.”

Kurt Becker, the Associate Provost for Research and Technology Initiatives at the NYU School of Engineering, explained that the city is an auspicious place to run a clean-tech incubator like the Urban Future Lab. “The last administration was very amenable to the startup culture, and we look forward to partnering with Mayor de Blasio on clean technology.”
A Spike in Success

Students at NYU are committed to tackling real-world problems, and the University’s hands-on learning environment is targeted at helping them. It doesn’t get more hands-on than working in an actual start-up company, directly impacting the outcome of the business while gaining practical skills. The Skill-based Program for Incubator Knowledge and Employment (SPIKE) is facilitating that experience for several talented students. Ontodia, which operates out of the Varick Street Incubator, is just one of the companies making good use of NYU’s pool of bright, motivated young people thanks to the initiative.

“We love SPIKE,” Joel Natividad, Ontodia’s CEO and co-founder says. “Getting good engineers is hard, because they are in such demand! But we now have first dibs on the best!” SPIKE was launched by NYU’s Incubators and the Wasserman Center for Career Development with the aim of supporting the companies developing in the incubators while providing a chance for students to learn the skills they’ll need in the work world. It’s a win-win situation for everyone.

“We’ve gone from being two people working in a basement to a thriving company of eight people here at Varick Street with the help of SPIKE,” Sami Baig, the president and co-founder of Ontodia, explains. “Engineering interns are exemplary. You might think of interns just being sent out to get coffee, but not this group. They really produce.”

Ontodia, which aims to create “human-powered, machine-accelerated, Collective Knowledge Systems,” had its first full-time hire with NYU School of Engineering grad Aizizi Yigaimu, who has since been joined by five interns. All of them are grateful to be on the ground floor of a new venture, starting from scratch, and learning by doing. Ontodia’s founders have many reasons to be equally grateful. “We are lucky to be here at Varick Street, with all the advantages that offers,” Natividad says.

HEVO is a collaborative effort in other ways too: Aditya Karan Sharma, who earned his master’s degree in electrical engineering from the NYU School of Engineering, oversees technology for the company, and he is working closely with a group of professors, including Francisco de León, under a joint development agreement.

“Our partnership with HEVO has the potential to greatly speed the commercialization of our research,” Professor de Leon says. “It represents a successful and efficient division of labor.”

Soon the NYU community can see for itself how game-changing HEVO’s power stations can be: the school will be the site of two units, meant to charge the electric security vehicles that patrol the Washington Square campus.

For more information about the company’s products and investment opportunities, visit www.hevopower.com or call 212-292-3191.

“Our mobile app benefitted greatly because we were able to bounce ideas off of other tenants and pick their brains. It really fosters a sense of excitement and collaboration that we might not get in other office settings.”
CROSSROADS OF COLLABORATION

Challenge Accepted

A Team of Professors Combine Their Expertise to Save Lives

NYU Professor Jonathan Viventi and one of the implantable devices he’s created to treat neurological issues
able for five: it’s winter in New York City, and four scientists and an engineer meet for dinner. Picture them talking intently, laughing, this one leaning forward over his beer glass, that one scribbling notes. Each has a distinct specialty: Michael Long studies how birds sing, Bijan Pesaran studies how monkeys move their arms, Jonathan Viventi develops electrical and computer engineering technologies, Dan Sanes studies deafness, and Robert Froemke studies memory.

Last winter, it might not have been apparent how the different research trajectories of these five men were about to intersect. But fast forward one year, and they are collaborating on a project that could potentially revolutionize the way we use technology to interface with the human brain. And they’re launching that project with a quarter of a million dollars in prize money from a new competition at NYU.

A Grand Challenge

In the December 2012 announcement of NYU’s inaugural Grand Challenge, the university’s Senior Vice Provost for Research, Paul Horn, lauded faculty and alumni for their involvement in “some of the world’s most widely hailed, important and far-reaching achievements: the creation of the telegraph, the shaping of jet aircraft wings, the development of the polio vaccine [and] of effective monoclonal antibody drugs to combat auto-immune disease.”

The Grand Challenge aims to continue this legacy of innovation by awarding $250,000 in seed funding—and the commitment to help obtain future support—to faculty teams proposing imaginative, problem-solving projects with potential for public benefit. The award money is a reinvestment of university proceeds from prior faculty discoveries, and the competition is modeled on similar “grand challenges” put forth by the Gates Foundation and the White House.

Thirty-two teams of researchers submitted proposals for NYU’s Grand Challenge, and six months and two rounds of internal and external review later, two projects received funding. One is a “MetaGenome” project that will map the microbial genome of New York City to identify potential bio-threats and improve public health. It’s led by NYU biology Professor Jane Carlton, who also directs the NYU Center for Genomics and Systems Biology. (Cláudio Silva, professor in the Department of Computer Science and Engineering at the NYU School of Engineering and head of disciplines at the Center for Urban Science and Progress [CUSP], is also a member of the eight-person MetaGenome team.)

The other is “Smart Neuroprosthetics: Brain-Machine Interfaces for the 21st century,” led by NYU Polytechnic School of Engineering’s Viventi in collaboration with researchers Froemke, Long, Pesaran, and Sanes—his winter dinner companions from NYU’s medicine and neuroscience teams.

A New Direction

What these five aim to do together is the stuff of good science fiction. The Smart Neuroprosthetics project will explore brain-computer interface to develop three things: a motor prosthesis that might restore motion to paralyzed patients, a smart hearing aid that could improve cochlear implant technology, and a cognitive prosthesis for the central nervous system that may improve learning and memory in patients suffering a neurological deficit or injury.

Existing implantable devices are too unwieldy for use in the brain, but the NYU School of Engineering is already working
on small, high-resolution, bendable, and wearable device arrays. The Smart Neuroprosthetics team will adapt these devices to create wireless models usable for medical purposes, and in so doing may also advance our understanding of brain function.

Although the project is in its earliest stages, Froemke says, “The real milestone so far was the insight that we could, in principle, design a ‘one-size fits all’ prosthetic device for each of our scientific questions. Essentially, using the electrode array to provide a new form of biofeedback based on neural signals was the key to the whole Grand Challenge proposal, and now that the project is funded, we’re able to hit the ground running and work in parallel on the three systems.”

Viventi’s work with wireless, implantable electrodes may be the key to controlling brain activity at the single-cell and network levels to improve the state of the art for medical devices. However, he says it’s the opportunity to collaborate with his NYU colleagues and their labs—“the rallying cry” of the NYU Grand Challenge grant, as his colleague Froemke puts it—in developing and testing new neuroprostheses that has unlocked the potential of this ambitious project.

“We all knew each other and had been meaning to work together,” says Viventi. “This was a great opportunity for us to start a new research direction and get outside of our normal projects in our individual labs.”

A Collaborative Process

“The most surprising aspect of our collaboration is the tremendous synergy between investigators who, up until this project, had little obvious scientific overlap,” says Sanes. Most of the Smart Neuroprosthetics team members are relatively new to their universities and had not previously collaborated. Sanes characterizes their process as “both sanguine and empirical.”

Froemke has another phrase for it: “a lot of fun.”

“It’s an iterative, three-stage process, basically talking shop over dinner or a beer, speculating about what we could all do together,” he says. “Then we meet formally and discuss details; then we start writing and pass draft proposals back and forth. Then it’s back to step one to discuss progress ... in a more informal way conducive to creative problem-solving and brainstorming—excuse the pun.”

While the project’s success will rely on a complex bridge between engineering, medicine, and neuroscience, the team credits the institutional bridge between NYU and its School of Engineering with making it feasible. “It’s fair to say that the project would not even have been conceived, had it not been for the merger between NYU and its School of Engineering and the ensuing commitment to laboratories that apply concepts from signal processing, low power circuits and wireless technology to the basic and clinical research problems that confront neuroscience,” says Sanes.

Viventi says the merger was integral to his decision to join the NYU School of Engineering a few years ago. “The ties with the medical and neuroscience divisions at NYU are a huge part of the reason I came to Brooklyn; my research lies at the intersection of those domains,” he says. “None of this would be possible without collaboration across disciplines.” From their earliest dinner dates, he says, when their first efforts on the project were bootstrap and self-funded, the collaborative effort has been organic, and he hopes that with the support and funding of their universities via the Grand Challenge, their work will lead to improvements in the state of the art for medical devices.

“Cross-disciplinary research is the well-spring from which new scientific fields emerge,” adds Sanes. “My sense is that societies that support adventurous, if somewhat risky, research programs, tend to inherit an improved standard of living a generation or two down the road. It is to NYU’s School of Engineering’s great credit that it recognizes and promotes this goal.”
Ten years ago, Dan Guido was forbidden to touch a computer. After using his early-honed hacking skills to uncover vulnerabilities throughout his Long Island high school district’s network, Guido was persona non grata in the computer lab for his junior and senior years. But it was too late. “I was hooked by then,” Guido, now 28 and the CEO of computer security firm Trail of Bits, said. Today, much of his industry-shaking work is rooted in his hacker past, helping corporations, government agencies and NYU School of Engineering students change their approach to security. He teaches them to think like attackers.

Guido’s philosophy—that computer security isn’t about secure code, it’s about defending against attacks—permeates everything he touches, from his research at Trail of Bits, which he co-founded in 2011, to the classes he teaches at the NYU School of Engineering and his participation in the university’s annual Cybersecurity Awareness Week (CSAW) games.

He proved his attack know-how at his first CSAW when, as a freshman, he nabbed second place in the Capture the Flag competition and shortly thereafter cracked into the school’s Information Systems and Internet Security (ISIS) Lab secure online forum. Guido acknowledges having a knack for “breaking the rules without being destruc-
tive,” and in the current climate, where a glance at the newspaper proves that no bank, corporation or government is immune to cyberthreats, it’s exactly those skills that set him apart.

Guido and his team at Trail of Bits are steering the security conversation away from subjects like software vulnerabilities and patching, focusing instead on identifying the kinds of attacks an organization is most likely to face. They contend that it’s only through an attack that security gaps and vulnerabilities come to light—but Guido and his colleagues don’t wait for a strike. Instead, they simulate them, helping organizations develop strategic defenses based on real data.

As one of the NYU School of Engineering’s two Hackers-in-Residence, Guido teaches this brand of defense to the next generation of student hackers. His graduate courses, Penetration Testing and Vulnerability Analysis, are cornerstones of the University’s acclaimed cybersecurity program, and are transformative classes for many students.

In 2012, Guido founded THREADS, a security conference that coincides with the CSAW games. The event’s name derives from its goal, which Guido says is to “explore a single new thread in security each year, to the deepest level possible.” After a successful inaugural conference focusing on a buzzworthy concern in the security community—mobile security—THREADS is back this year with the only public forum on an aggressive effort to speed innovation in the field—the Defense Advanced Research Projects Agency’s Cyber Fast Track program (CFT).

Launched in 2011 as an experimental program to bridge the gap between the hacker/researcher community and the intelligence community, Cyber Fast Track provided individual researchers and small teams with relatively modest grants—$200,000, on average—to quickly advance promising cybersecurity technologies. Prior to CFT, DARPA took an average of eight months to review a grant application—a glacial pace when juxtaposed against the rapid evolution of cyberthreats.
“Cyber Fast Track was a revolutionary way to approach government-funded security research,” said Guido. “Grants like this usually go to big companies, but in this case, DARPA focused on funding the really innovative individuals, many of whom quit their day jobs and started companies after receiving CFT grants.”

Eighteen months and 100 grants later, DARPA closed the CFT program without issuing a report on the program’s progress. Guido sensed an opportunity, and reached out to famed hacker-turned-DARPA program manager Pieter “Mudge” Zatko. Together, they hatched a plan to bring the best of CFT to light at THREADS 2013. Guido invited the top ten CFT grantees to present their work at the conference and issued a call for papers to the remainder of the CFT community.

THREADS served as the first public forum on CFT, offering several hundred attendees unprecedented access to the researchers pioneering some of the most exciting work in security today.

“These presentations aren’t theoretical,” said Guido. “These are working security professionals, so the kinds of itches they’re going to scratch are immediately relevant to tactical problems that need to be solved in the field.”

And much the way that CFT linked researchers to DARPA, THREADS adds an element Guido believes is crucial for CSAW—it’s a draw for the professional community. “We had fantastic attendance from students and researchers from around the world, but this is the final piece of the puzzle,” he said. “It’s especially important for students who want to pursue security to have opportunities to come face to face with professionals.”

From where Guido stands, THREADS is also a glimpse into the future of security education. The cutting-edge presentations offer a sense of where he believes his teaching focus should be for the next two years. “This is the kind of research that can really influence the direction of learning, both for students and professionals,” he said, “and I get to reach out and help people understand these complicated issues.”
The Real Cyber Experts

Visit any large bookstore and chances are that you’ll find shelves of mass-market paperbacks with “cyber” in their titles. Some envision a world in which rogue governments have initiated devastating “cyber-wars,” while others take place in the shadowy realms of identity theft and financial malfeasance. Readers need not fear, however; by page 20, we are generally introduced to the cybersecurity expert—often a dashing lone wolf-type who favors black clothing and dark glasses (even indoors).

While real-life cybersecurity experts can, of course, be dashing, and some may even sport black clothing on occasion, very few are lone wolves. Cybersecurity has evolved into a multidisciplinary field that requires cooperation among computer scientists, psychologists, law-enforcement personnel, economists, policy makers, and others.

In the not-too-distant past, most computers—massive mainframes that took up entire rooms—were located in government offices, and the government’s predominant security concern was keeping sensitive data away from its Cold War foes. Today, however, digital data is essential not only to the functioning of the government but to almost every facet of our lives, from our personal finances and healthcare to our jobs. Because of this increasing reliance on information technology, cybersecurity is becoming ever more crucial.

At the NYU Polytechnic School of Engineering, Cybersecurity is an Interdisciplinary Pursuit
At CRISSP, students work on a broad range of projects, expanding their horizons well beyond their original area of specialization.

Nasir Memon co-directs the NYU School of Engineering’s Center for Interdisciplinary Studies in Security and Privacy (CRISSP), which brings together educators from various fields, with the aim of producing graduates who can create exceptionally secure information technologies based on a deep understanding of social, economic, behavioral and public policy implications. The center merges the NYU School of Engineering’s security-technology strengths with NYU’s formidable expertise in cryptography (the Courant Institute), public policy and planning (the Institute for Civil Infrastructure Systems), the economics of information security (the Stern School), and legal issues and privacy (the Center on Law and Security). Another partner, the John Jay College of Criminal Justice, provides key expertise in the handling of cyber-crime.

At CRISSP, students work on a broad range of projects, expanding their horizons well beyond their original area of specialization. “In many ways, the social science I’m exploring is much more difficult than the technology I deal with,” Mike Karlesky, a graduate student in computer science, said. “Human beings are often unpredictable and lack the logic inherent in computer systems.”

It’s Not All Fun and Games

Karlesky explained that in most systems, usability and security are in constant tension. “You will hear repeatedly that you can have either a truly secure system that people dislike using or a user-friendly system that isn’t very secure,” he said. “But at CRISSP, we’re trying to prove that tenet wrong by exploring the possibility of ‘playful’ security systems that people actually enjoy working with.” He continued, “No one really likes using passwords; they can be hard to remember and it’s frustrating to have to reset them regularly, and keycards [like those used in offices, labs and hotels] are easily lost or damaged.” To circumvent those problems, Karlesky is working on a project dubbed “OpenSesame,” which he and his colleagues have been testing on the entrance doors to NYU’s Game Innovation Lab. Instead of the usual keycard, the system recognizes a user by a gesture of his or her choosing. “When we were conducting preliminary tests, most people did some variation on waving as their gesture,” Karlesky recalled. “But we also had some more creative movements—bowing or twirling, for example. Thankfully, social constraints meant that people refrained, for the most part, from making obscene or offensive gestures.”

Gesture-based authentication technology is in its early stages, and Karlesky is eager to develop increasingly more efficient—and more playful—models. “Security systems are absolutely essential, and it’s important that they be as infallible as possible,” he said, “but there’s no reason that they can’t also be fun.”

Tehila Minkus, also a graduate student in computer science, is on a major mission at CRISSP: to alert the public about the importance of Internet privacy and the worth of their personal data. “Personal information is very valuable to marketers and salespeople,” she said. “It’s almost like a new form of currency, yet we often give it away for free or in exchange for a nominal discount on a product.” Even those computer users who claim to value privacy frequently tell researchers that they don’t see targeted ads as intrusive, because they enjoy receiving coupons or other small perks. “That kind of inconsistency sometimes makes privacy research an uphill struggle,” Minkus said.

While most people understand the importance of keeping their social security numbers private, many are less careful with birthdays and other such information. “A birth date doesn’t reveal only your age,” Minkus warned. “If someone knows your date of birth, zip code, and gender, it’s very easy for them to hone in on you, and they can then social engineer [or manipulate] banks and other institutions into divulging even more sensitive information.”

Minkus and her colleagues are investigating why people care about privacy to varying extents and how well they guard their information on sites like Facebook. “We are discovering that there’s a correlation between personality type and privacy settings,” Minkus said, explaining that she looked at the five major traits outlined by psychologists: openness, conscientiousness, extraversion/introversion, agreeableness and neuroticism. One day, there may be an application that allows Facebook users to take a personality assessment and receive suggested privacy settings based on the results.

Choosing to Wear a Black Hat or a White One

When Jerry Backer was growing up, he was more interested in taking apart his handheld video game to see how it worked than in actually playing the games. Later, as an undergraduate in the computer engineering department at the City College of New York, he continued to experiment, modifying his devices to expand their capabilities or broaden their utility. One day a professor explained the concept of reverse engineering and warned that Backer might unwittingly be engaging in illegal activity. He was shocked. “I always figured that if I purchased something, it belonged to me and I could do whatever I wanted to it,” he said. “I never intended to do anything actually illegal.”

Upon arriving at the NYU School of Engineering, Backer was excited to discover CRISSP, where he is currently working on transparent malware analysis—reverse engineering malware programs in order to disarm them. In addition to technology, he is also fascinated by politics and policy, and CRISSP is allowing him to explore those areas. “CRISSP is an important program because policy makers are really going to need technologically adept advisors or they will never be able to keep up,” he said. “Technology is growing so rapidly, and Washington tends to move pretty slowly.” He looks forward to taking CRISSP courses at NYU’s School of Law in the coming semesters. “I’m just glad to be on the right side of the law now,” he quipped.
In 2010, researchers at the University System of Georgia completed a decade-long project documenting the academic outcomes of studying abroad. Data showed that students who studied abroad demonstrated enhanced academic performance, higher graduation rates, and a greater understanding of cultural practices and contexts.

The study didn’t cover possible outcomes like back-flipping into the Mediterranean Sea, chilling on the grounds of Buckingham Palace, or skateboarding down the middle of a closed Tel Aviv highway during Yom Kippur, but those are the first photos that NYU Polytechnic School of Engineering students Peter Milani, Nicolette Nunez, and Stephen Carter pull up when asked about their experiences overseas.

“I’m the one in the Burger King hat,” says Milani, referring to a photo of confetti-strewn revelers at the annual carnival of Viareggio.

Such experiences go deeper than confetti, though. “I have always believed that learning is optimized [by] perspective,” says Rachel Pham, who at press time was preparing to leave for a semester on NYU’s Paris campus. “One flaw I see in American students is a lack of knowledge about the world beyond the U.S. I [want] to have cross-cultural experiences in order to understand people better, see as many perspectives as possible, and make better decisions and
judgments in my own life.”

Pham’s studies in Paris will include French language, history, and politics. Most engineering students who have taken advantage of the increased study-abroad opportunities since the beginning of the affiliation between NYU and its Brooklyn location in 2008 have welcomed the chance to explore classes outside their major.

“I took courses I couldn’t ordinarily take, given the intensity of the physics program,” says Nunez, who studied psychology and ethics at NYU’s London campus in the fall of 2011. “It was a nice release from the rigorous math and science schedule that I’m used to, [and] it broadened my education [through] different types of problem solving.”

Carter, whose fall 2012 course load in Tel Aviv included Middle-Eastern diplomacy and negotiation, agrees: “The humanities courses broadened my perspective on problems I was trying to resolve, whether it might be friction during a team project or finding a clearer way of expressing my thoughts and opinions.”

The journal *Science* has reported that humanities study can deepen and extend the life of a science degree by giving students tools for communication, reflection, adaptation, self-teaching, and interdisciplinary flexibility. Perhaps that’s why Meagan Watson, an NYU alumnus and the NYU School of Engineering’s Coordinator of Academic Advising, feels that incorporating the humanities in an engineering education exem-
plifies the NYU School of Engineering’s ideology of an innovative education: “[creating well-rounded engineers] requires merging disparate studies in a creative way. We are giving [students] the opportunity to find creative connections.”

Milani, who took drawing and architecture courses in Florence this past spring, believes his newfound passion for Renaissance architecture and art better prepared him for an engineering career: “These creative approaches to structures can be applied to my future work in structural engineering.”

Connections are crucial, but as any seasoned traveler will tell you, the most rewarding experiences are often the unexpected ones. For instance, in London, Nunez was initially startled at the prevalence of a lively pub culture in which students continued class discussions over beers with their professors after class. Eventually, though, it became a way “to think and speak freely in an environment that [was] much less intimidating than a classroom.”

Carter, who studied in Tel Aviv in the fall of 2012, was surprised that most of his college peers were older and more experienced than him. While working together on an electric car formula project internship, he says that age and experience “made them so much better suited for tackling problems they faced everyday as engineers.” The difference, he learned, was the military conscription required of Israeli citizens at age 18.

Carter also found that “physics in Israel was harder than I expected. It was more abstractly framed. I struggled but managed all right in the end, and now that I’m back,
I’m able to apply [that learning] to courses like Philosophy of Quantum Mechanics and Measurement Systems. I’d never have imagined my frustrations then would make life so much easier now.”

“Studying abroad promotes the academic mobility of our students and encourages them to build a global network,” says Watson. “In an increasingly global society, being culturally fluent is exceedingly important.”

Milani agrees. “The whole reason I decided to study abroad was to be inspired by new experiences and different cultures,” he says, adding that it was frequently the pedestrian nuances of life in another culture that found a home in his memory, like the vision of fashion-conscious Italians wearing jackets, scarves, and long pants on a sweltering, 95-degree day. “Noticing the small things, whether abroad or at home, allows me to appreciate the situation that I’m in,” he says. I hope to continue appreciating the small distinctions of my experiences.”

Ultimately, the truest souvenirs of the traveler are these sorts of intangibles: new appreciations, new connections, and the sense that the world is at once larger and smaller than we had previously perceived. As the French novelist Marcel Proust famously said, “The real voyage of discovery consists not in seeking new landscapes, but in having new eyes.”

Or as Pham, packing up for her studies in Paris, puts it: “I hope that studying abroad will enlighten me in ways I have yet to even understand.”

Peter Milani, B.S. Civil Engineering 2015
Sowing the Seeds for Collaborative Research

Annual Grants Spark a Tradition of Cross-Disciplinary Work Across the NYU Campuses
In 2009, when New York University Provost David McLaughlin and Erich Kunhardt, then Provost of the Polytechnic Institute of New York University (Now the NYU Polytechnic School of Engineering), announced that a $5 million “seed” fund would be distributed over the course of the next five years, their aim was to support research projects between NYU and the then Polytechnic Institute of NYU, thereby strengthening the affiliation between the two institutions.

The announcement set off a whirl of academic “matchmaking” that resulted in several surprising—and effective—research partnerships. “My focus is on materials testing,” Nikhil Gupta, an Associate Professor of Mechanical Engineering at the NYU School of Engineering, explains. “When I became interested in designing better military body armor, I knew that while I could simulate the force of a bomb explosion in my lab, using machines that I built, I didn’t have the biological know-how—and just as important, the specimens—to do the testing I would need on bones.” That problem was solved when he connected with Paulo Coelho, an Assistant Professor of Biomaterials & Biomimetics at NYU’s College of Dentistry.

Working together, the mechanical engineer and the dental professor discovered that the animal femurs they were testing developed fractures too tiny to be detected by CT scans or other diagnostic technology. “Even if the bone looked fine, there could be major, debilitating damage,” Gupta explains. Their findings were published in Materials Science and Engineering and in the Journal of Biomechanics and have been of great use to military doctors. Now funded by grants from the U.S. Army, they are continuing their work. “The seed grant made it easy for us to collaborate,” Gupta says, “and both our labs have benefitted.”

Gupta and Coelho are just two of the researchers who received grants during the first round of the program. Jonathan Chao, the Head of the NYU School of Engineering’s Department of Electrical and Computer Engineering, teamed with Nandor Ludvig, a neurologist from NYU’s School of Medicine, to investigate developing a fully implantable device for the detection and treatment of epilepsy. So promising is their work that Chao, who is now collaborating with NYU’s Ruben Kuzniecky, received another round of funding in the program’s third year. “We could not have built the stellar team we have without the seed grants,” Chao says. “It now includes three doctoral students, more than a dozen master’s students, an undergraduate and an engineering staffer.”

Since its inception, the seed-grant program has encouraged collaboration between not only engineers and medical researchers, but electrical engineers and mathematicians (NYU School of Engineering’s Zhong-Ping Jiang and Courant’s Charles S. Peskin), and computer scientists and ocean-atmosphere specialists (NYU School of Engineering’s Edward Wong and NYU’s David Holland), to name just a couple of the pairings.

The fourth round of funding, which was recently announced, includes similarly exciting partnerships, including a robotics project undertaken by NYU School of Engineering’s Joo H. Kim and Steinhardt’s Gregory Gutierrez; a venture called Data Visualization for Human Rights by NYU School of Engineering’s Enrico Bertini and Oded Nov, along with Margaret Satterhwaite of NYU’s School of Law; and a big-data-enabled study of real estate ownership in urban neighborhoods by Juliana Freire, who has appointments at the NYU School of Engineering and Courant, Vicki Been of the NYU School of Law, and Ingrid Gould Ellen of Wagner.

“The seed grants have really lived up to their name,” NYU School of Engineering’s Associate Provost for Research and Technology Initiatives Kurt Becker says. “In addition to resulting in some fantastic research with real-world applications and attracting millions of dollars in outside funding, the program has fostered a wide-ranging sense of teamwork and cooperation among [the NYU School of Engineering] and the other schools across the university.”
Joseph Sabell
'63BSEE '71MSEE
Joseph Sabell was recently promoted to Executive Director, Global Business Development at Paraa Wireless Communications, in Greenwich, CT. Paraa Wireless provides technical assessments of patent portfolios for large, well-known technology firms worldwide. Mr. Sabella will be responsible for sales in North America, management of salespeople in Europe and Asia, and global branding.

Emeric Deutsch
'69PhD
Emeric Deutsch '69 PhD and retired professor of the NYU Polytechnic School of Engineering, recently published a paper entitled "Computing the Hosoya Polynomial of Graphs from Primary Subgraphs" in MATCH, Communications in Mathematical and Computer Chemistry, vol. 70, 2013.

Paul Dillon
'66BSChem
Paul Dillon is currently a consulting biostatistician for Siemens Healthcare Diagnostics in Tarrytown, NY. This past September he had a publication in Gastroenterology (S. Muraliar, R. R. Henry, A. J. Sanyal, L. Morrow, H.-U. Marschall, M. Kipnes, L. Adorini, C. I. Sciacca, P. Clopton, E. Castelloe, P. Dillon, M. Pruzanski and D. Shapiro, "Efficacy and Safety of the Farnesoid X Receptor Agonist Obeticholic Acid in Patients with Type 2 Diabetes and Nonalcoholic Fatty Liver Disease," Vol. 145, pp. 574-582, 2013). He is also Program Director for the Westchester Chemical Society; anyone wishing to volunteer to speak on a chemically related topic may contact him at paulwdillon2@hotmail.com.

Debra Freedman
'81MOT
Debra Freedman is the author of two recent, well-received books: The City Dog Meets the Country Dog and Let's Communicate: Communication Skills For The 21st Century.

Leonard Singh
'98EE
Leonard Singh is very excited about the transformation of his alma mater and strongly encourages all fellow alumni to get involved.

Fiorin Petre
'10EE
On October 19, 2013, Fiorin Petre facilitated the Toastmasters @ NYU Alumni Day Session.

John Yankovich
'92EE
John Yankovich, a member of the Poly Alumni International Board of Directors, has 22 years of experience in the electronics industry (1976–1998) and 15 years as a patent attorney (1998–2013). His daughter recently applied to NYU.

Perveen Manowar
'10CO
After graduating, Perveen Manowar worked at Siemens on two NYCT projects: PACIS (countdown clocks) on the IRT and CBTC Culver Test Track (signals and safety project).

Gary Ogin
'69PH
Gary Ogin earned an MD degree in 1976 from the University of New Mexico. He completed residencies in internal medicine and anesthesiology and a fellowship in pediatric anesthesia. His specialty is now pain medicine.

Robert Migliore
'87EE
After graduation, Robert Migliore moved away from New York City but returned about 10 years ago. For the last two decades he has been working in the Biotechnology/Pharmaceutical field.

Joe Giovannirella
'69ME
Joe Giovannirella retired from United Airlines in December after 22 years of service.

Joseph Castellano,
'64MS '69PHD
Since retiring as the CEO of a consulting company, Joseph Castellano has been volunteering with the RESEED program, helping to teach physical science to eighth graders. For the past two years he has also been an ACS Science coach.
David A. Conklin

The NYU Polytechnic School of Engineering mourns the passing on July 25, 2013 of a treasured alumnus, friend, trustee, and benefactor, David A. Conklin ’52 ’59. He will be sorely missed.

Conklin was an inaugural member of the donor society known as the Polytechnic 100, and he played an active role at the school, serving as chairman of the Board of Fellows and as a member of the Board of Trustees.

A native of Long Island, he became interested in science early in life, trading his older sister a set of ivory figurines given to him by a cousin in the Merchant Marines for her chemistry set. He was drawn to Brooklyn by the chance to study with two icons in the field of chemical engineering—Donald F. Othmer and Raymond E. Kirk. Conklin enjoyed an illustrious academic career here, graduating cum laude and winning the Alfred Raymond Award for his undergraduate thesis.

In a career spanning more than four decades at the pharmaceutical giant Merck & Co., he rose steadily through the ranks, ultimately becoming president of the chemical manufacturing division and senior vice president for science and technology. He also served for a time at the Walter Reed Army Institute of Research in Washington, DC, where he was recognized for his meritorious service.

In honor of his 1995 retirement, the Merck Foundation donated $150,000 to his alma mater. Aided by matching funds from the National Science Foundation, the school created the David A. Conklin Laboratory, dedicated to the study of polymers.

Conklin chaired the National Coalition for Advanced Manufacturing (NACFAM) and was a member of the National Action Committee for Minorities in Engineering (NACME), among other such groups. A devoted Rotarian, he counted family and community as his highest priorities.

His commitment to us will long be remembered. We extend our heartfelt condolences to his wife, Ruth, and to his children and grandchildren.

Arthur Aaron Oliner

Our entire community deeply mourns the September 9, 2013 passing of Dr. Arthur Aaron Oliner, a world-renowned scientist, educator, entrepreneur, and innovator, who was one of the principal leaders in the development of the theory and applications of microwave guidance and devices that occurred following the Second World War.

Dr. Oliner served as head of the Electrical Engineering Department from 1966 until 1974, and from 1967 to 1982 he directed the Microwave Research Institute (MRI), which was one of the most prestigious university institutions in the world in the area of electromagnetic field theory and microwave components.

He was a Presidential Fellow of the Institute and had been a Professor Emeritus of Electrophysics in the Department of Electrical and Computer Engineering here since 1990.

Additionally, Dr. Oliner was a co-founder of Merrimac Industries. Now a subsidiary of Crane Aerospace & Electronics, Merrimac is a leader in the design and manufacture of radio frequency/microwave signal processing components and subsystem assemblies for the global defense, satellite communications, commercial wireless, and homeland security markets.

Among his many prestigious honors were an honorary doctorate from the University of Rome; the Balthasar van der Pol Gold Medal of the Union RadioScientifique Internationale (URSI); the Institute of Electrical and Electronics Engineers (IEEE) Heinrich Hertz Medal for contributions to the theory of guided waves and antennas; and the IEEE Microwave Prize, which acknowledged the importance of his work on early printed circuit (strip-line) design discontinuities.

A member of the U.S. National Academy of Engineering, he was also one of only seven Honorary Life Members of the IEEE’s Microwave Theory and Techniques (MTT) Society; in 1982 he received the society’s Career Award, their highest honor. In 1993 he became the first recipient of the society’s Distinguished Educator Award. His other IEEE laurels included a Centennial Medal (1984) and a Millennium Medal (2000).

In 2007 New Frontiers in Radiation and Guidance Phenomena: a Tribute to Arthur A. Oliner was published. In its preface, the editors praised his innovative research, brilliant teaching, scientific insight and exceptional kindness.

Dr. Oliner was predeceased by his wife of almost seven decades, Frieda Ginsberg, who died in March, just months before him. We express our heartfelt sympathy to their two children, Marian and Eric, as well as to their grandchildren and great-grandchild.
In Esperanto, Soros means "will soar," and Paul Soros undeniably lived up to the name. His life’s trajectory—from his arrival in Manhattan with $17 in his pocket to his rise as one of the most influential shipping-industry engineers of the 20th century—was one of soaring vision, soaring achievement and soaring success.

Soros, who earned a master’s degree in mechanical engineering from our school in 1950, had spent his childhood summers on an island in the Danube, right next to the passenger terminal. Sitting with his friends, he watched the massive ships dock and undock and gained an almost visceral understanding of the behavior of mooring systems. As an adult engineer, he realized that holding ships with mooring buoys would result in a port system that would not only require less initial investment but would also make it possible to load and unload ships in rough seas where it was not feasible to tie the ships to fixed structures, as was the norm.

Thanks to his natural ability, stellar education and maritime knowledge, Soros found himself at the forefront of a new engineering specialty. Eventually, Soros Associates, the company he established, had projects in some 90 countries and was involved in engineering the highest capacity ports in the world for iron ore, coal, bauxite, and aluminum.

When Soros died, on June 15, 2013, major papers around the world published tributes extolling his professional accomplishments. Many also mentioned his philanthropic ventures, including his creation of the Paul & Daisy Soros Fellowships for New Americans, which provides aid to immigrants seeking to gain higher education, and his sponsorship of Midsummer Night Swing, Lincoln Center’s outdoor dance party.

Fewer mentioned his support of our school, which was, nonetheless, generous, steady, and effective. Among other selfless acts, he made major gifts to the Department of Chemical Engineering and provided seed funding to start a novel graduate program in financial engineering. In 2012 he launched the Paul Soros Prize for Creative Engineering, later renamed, at his modest insistence, the Paul Soros/Jerry Hultin Prize, in honor of the school’s President Emeritus.

Thanks to Soros, new generations of students are getting their own chance to soar.
The entire NYU Polytechnic School of Engineering community congratulates the returning and newly elected officers and directors of the PIAA. Thank you for your commitment and dedicated service to the organization, your fellow alumni, and the school.
Do we have your current contact info? Update your e-mail address at http://engineering.nyu.edu/alumni/update-your-info. Don’t miss out on exciting news and invitations to alumni events!