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OUR NEW WORLD OF POSSIBILITY

A LOOK AT THE INSTITUTE TWO YEARS AFTER THE AFFILIATION WITH NYU

NEW YORK UNIVERSITY

NYU·poly

POLYTECHNIC INSTITUTE OF NEW YORK UNIVERSITY

Leading invention, innovation and entrepreneurship

As an award-winning researcher who has done pioneering work at the intersection of engineering and biology, Rastislav Levicky is used to solving thorny problems. In this case, however, the Donald F. Othmer Associate Professor of Chemical and Biological Engineering had hit a snag.

Levicky and his graduate students were modeling the behavior of synthetic DNA-like molecules to make more accurate and efficient bio-detectors: electronic devices that scan for biological molecules like gene fragments and bacteria. There is a large and growing market for such instruments, with established companies and emerging startups all vying to come up with the next breakthrough technology.

Levicky's approach, which employs synthetic rather than natural DNA to bind with and identify dangerous environmental pathogens such as E. coli and Staphylococcus, could make existing bio-detection systems more reliable and less expensive. But turning it into a viable technology will require understanding how synthetic DNA binds to the real thing. And Levicky had reached a point in his research where he could not explain some of the data that he and his team had collected.

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So he called a couple of colleagues: the NYU chemists Nadrian Seeman and James Canary, both of whom work with Levicky on a project to develop better models for designing synthetic DNA and understanding its behavior. Together, they comprise one of 21 collaborative teams made up of NYU and NYU-Poly faculty that NYU has funded to the tune of $1.5 million since Polytechnic entered into an affiliation with the university.

"They said, 'Well, take a look at this phosphorous molecule—it's chiral,'" says Levicky, using the technical term for a molecule that has distinct left-handed and right-handed forms. "'That could explain some of the behavior.'" It did, and the chemical feature that Seeman and Canary had noticed was not the kind of thing that would have been obvious to Levicky or his students. "A chemist and an engineer, looking at the same phenomenon, see complementary things," Levicky says.

Seeman, who invented structural DNA nanotechnology, sees similar benefits to their collaboration. "My own research has come closer and closer to engineering during my career, so the addition of an engineering school at NYU was really important to me," he says. "I'm working on projects that I might not have contemplated earlier." Seeman adds that Levicky brings not only specific technical expertise to their work, but also an engineer's unique perspective on science and technology. "The ability to reduce a scientific idea to a working device is invaluable," he says.

The affiliation with NYU, an agreement that turned Polytechnic University into Polytechnic Institute of New York University, and that will ultimately lead to a merger in which NYU-Poly will become NYU's school of engineering and technology became official in July 2008. Yet the work that Levicky, Seeman and Canary are pursuing illustrates in microcosm the tangible benefits that have already accrued to both institutions, and the promise of far more to come—for NYU, NYU-Poly and the world beyond their doors.

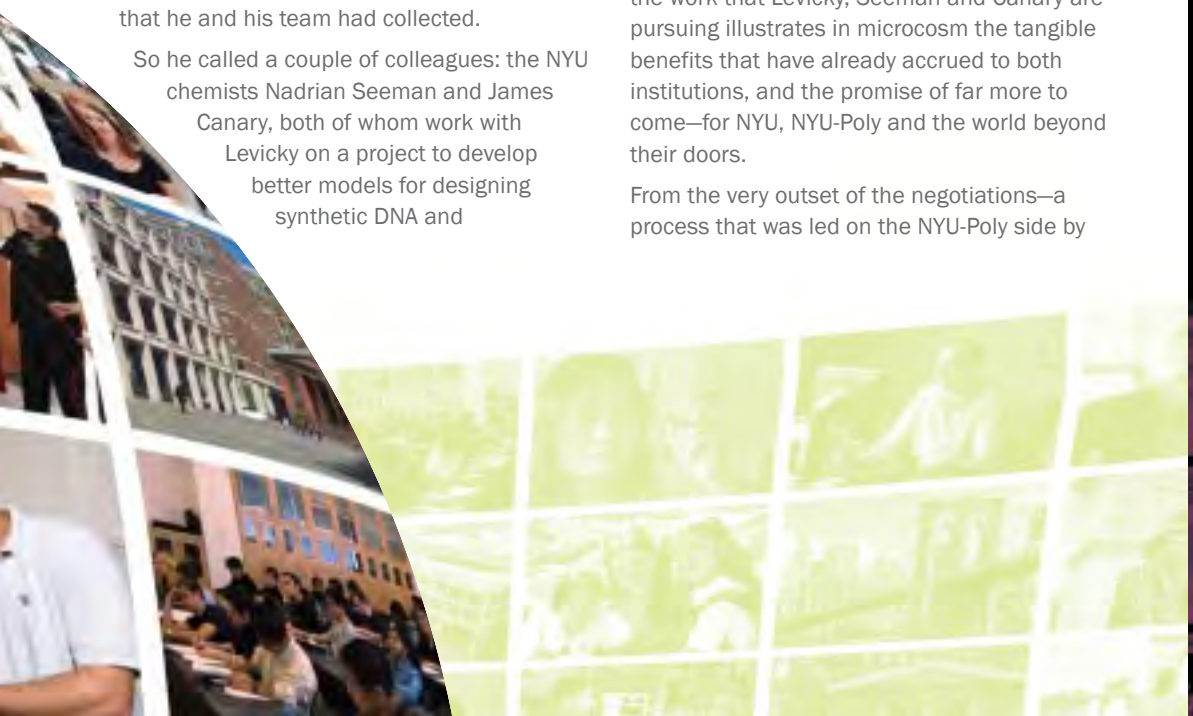
From the very outset of the negotiations—a process that was led on the NYU-Poly side by

OUR NEW WORLD NUMBERS

3-2
PROGRAM

NYU-Poly students can earn two bachelors degrees (one in engineering, one in another NYU-based science discipline) in a total of five years

18
Study Abroad Programs



OUR NEW WORLD NUMBERS

+34%

Entering Undergraduate Enrollment Fall '08-Fall '09

+117%

Graduate Enrollment Increase Since 2006

Increase of

1,368

FTEs Over 4 Years (2006-2010)

+100 points

Average SAT Score Increase

The engineering program at NYU Abu Dhabi was established by NYU-Poly, developed by its faculty and is led by Associate Provost Sunil Kumar, who serves as dean of the program.

President Jerry Hultin, then-Board Chairman Craig Matthews, his successor Ralph Alexander and former Provost Erich Kunhardt; and on the NYU side by President John Sexton, Board Chairman Marty Lipton, Provost David McLaughlin and Senior Vice-Provost Dianne Rekow (now provost for NYU-Poly)—the advantages for both institutions were clear.

"The biggest reason for the affiliation was to accelerate the strategic growth of Poly," says Hultin, noting that the relationship will further enhance the quality of the school's faculty, students and facilities, while providing access to the resources, recruiting power and fundraising network of a global research university. Even at this early date, the results are impressive: enrollments and SAT scores are up, NYU-Poly is drawing far more students from beyond its traditional recruiting grounds, and NYU is making available $50 million for new faculty hires and campus upgrades.

NYU, which today is one of the top ranking academic institutions in the nation, once again has access to a school of engineering and technology, something it lost in 1973 when its own College of Engineering, located at the old University Heights campus in the Bronx, merged with Poly. The recent affiliation and subsequent merger will, therefore, significantly enhance the university's scientific resources and technical capacity, creating a unique regional engine for invention, innovation and entrepreneurship— the three pillars of NYU-Poly's i^2e philosophy.

And that, in turn, will be a boon to the city of New York. Following the financial crisis of 2008, the mayor's office recognized that if the city's economy were to recover and grow, it needed to diversify—namely, by developing a healthy entrepreneurial tech sector of the sort that exists in San Francisco and Boston. By establishing a scientific and technological powerhouse capable of driving innovation all the way from the laboratory to the marketplace, the affiliation promises to help fill a gap in New York City's economic landscape.

It will also extend NYU-Poly's reach well beyond the city itself. NYU has 10 international sites on five continents; with that kind of international footprint, NYU-Poly will be in a position to spread the message of i^2e both near and far, providing technological solutions to problems faced around the globe. For example, the engineering program at NYU Abu Dhabi was established by NYU-Poly, developed by its faculty and is led by Associate Provost Sunil Kumar, who serves as dean of the program. The inclusion of biotechnology and biochemical engineering in the curriculum is expected to help "green" the Emirates by producing young engineers

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>
> *- Jerry Hultin*

who can help move the region toward a non-petroleum economy.

As the explosive growth in well-funded joint projects between NYU and NYU-Poly faculty demonstrates, such expectations are already being met. Three rounds of seed grants have been awarded for research in areas ranging from physics to dentistry, and other collaborative projects between NYU and NYU-Poly faculty have already attracted millions of dollars from external sources like Microsoft Research and the National Science Foundation. “What we are experiencing here usually takes years to realize,” says McLaughlin, the NYU provost. “Our faculty members are experiencing collaborative relationships with faculty and students at NYU-Poly that take research projects from inception to development to completion and into society.”

Examples of such productive teamwork abound. Mel Horwitch, a professor of technology management at NYU-Poly, and Ari Ginsberg, a professor of management and entrepreneurship at NYU’s Stern School of Business, have joined forces to create CleantechExecs, an executive training program that teaches senior managers how to market, finance and support clean technologies. In analyzing existing green technology programs at other universities, Horwitch and Ginsberg discovered that most focused on the process of manufacturing high-tech products and systems, while ignoring the question of how to promote and invest in such technologies in a city like New York, where manufacturing takes a backseat to sectors like financial services, real estate, and insurance. So they designed a unique program to give experienced executives the skills to start their own clean-tech businesses and to support green technology at existing companies.

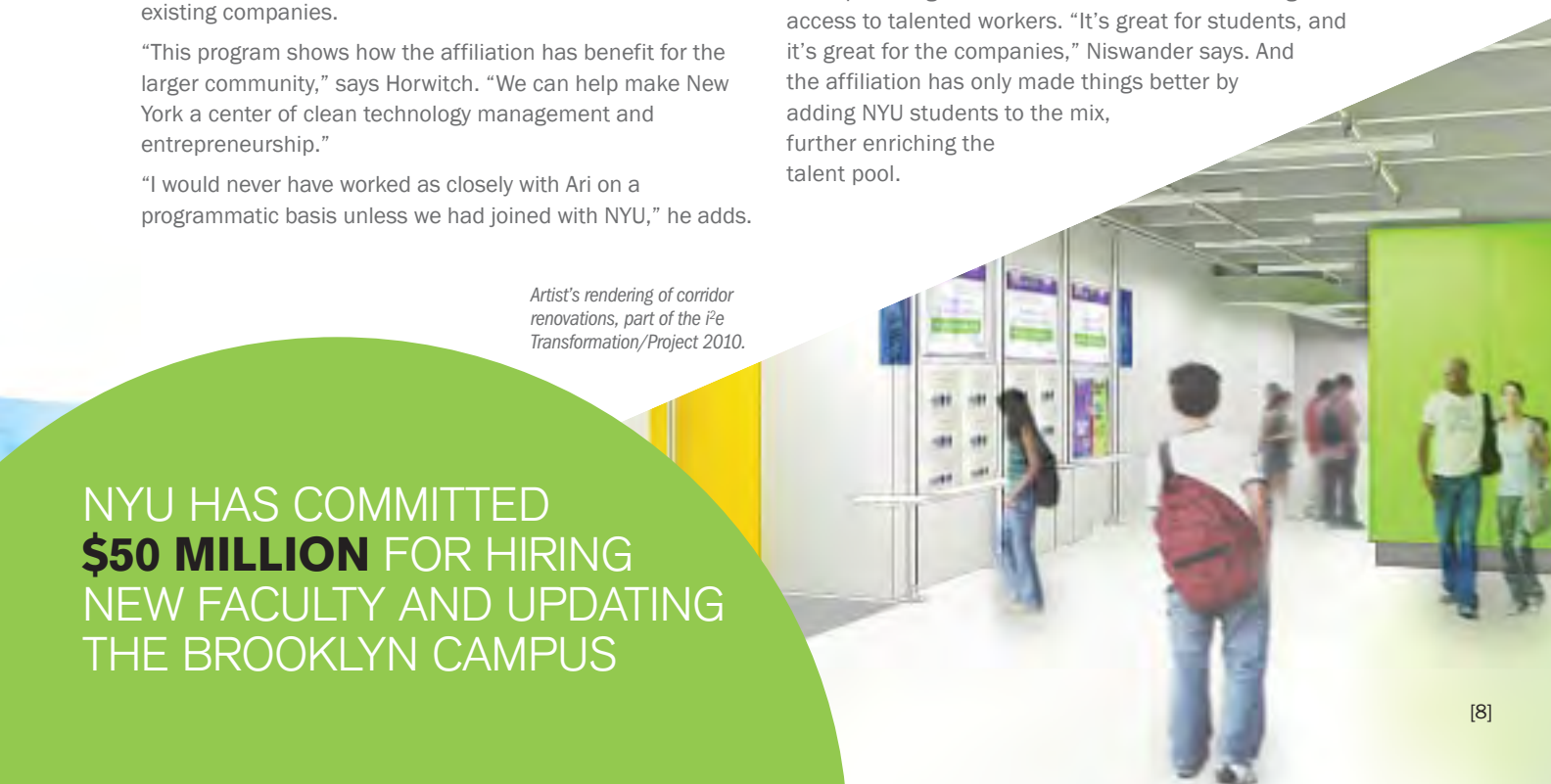
“This program shows how the affiliation has benefit for the larger community,” says Horwitch. “We can help make New York a center of clean technology management and entrepreneurship.”

“I would never have worked as closely with Ari on a programmatic basis unless we had joined with NYU,” he adds.

The first group of trainees attended tuition-free thanks to a $1.5 million grant from the New York State Energy Research and Development Authority (NYSERDA); and workshops were held at 160 Varick Street, the Manhattan incubator that NYU-Poly launched in partnership with New York City and Trinity Real Estate in February 2009. Bruce Niswander, the incubator’s director, says that it has benefited from the affiliation, as well.

160 Varick Street allows participating businesses to enlist student workers, either for pay or for course credit. It’s an ideal realization of the i²e concept: a system that lets NYU-Poly help get innovative companies off the ground, while providing small businesses with limited budgets access to talented workers. “It’s great for students, and it’s great for the companies,” Niswander says. And the affiliation has only made things better by adding NYU students to the mix, further enriching the talent pool.

Artist’s rendering of corridor renovations, part of the i²e Transformation/Project 2010.



NYU HAS COMMITTED **$50 MILLION** FOR HIRING NEW FACULTY AND UPDATING THE BROOKLYN CAMPUS

CleantechExecs, an executive training program that teaches senior managers how to market, finance and support clean technologies, is a powerful result of the collaboration between professors from NYU-Poly's Department of Technology Management and NYU's Stern School of Business.

Niswander has also been presenting patents held by NYU-Poly faculty to Ari Ginsberg's students at Stern to see if they can come up with viable commercialization strategies. "We've been getting a higher velocity of stuff coming from our professors," he says. "There's much more interest in taking an old patent and seeing if it's got commercial potential."

If the affiliation has opened up a host of fresh opportunities for collaboration and synergy between the two institutions, it has also prompted enhancements to NYU-Poly's own faculty and curriculum. With financial support from NYU, the school is currently recruiting new faculty in key areas that specifically align with its Strategic Plan; and new courses centered upon i²e are being introduced, including undergraduate offerings in engineering computation, simulation and design. Students, meanwhile, can now cross-register for classes at both institutions.

Michael Hailemariam '10CBE was one of the 50 students at both the graduate and undergraduate levels who took advantage of cross-registration. The sociology classes that he attended at NYU exerted a powerful influence on his attitudes toward engineering and its social implications.

"You get to interact with students who aren't in engineering, and it gives you a different perspective, influencing what you want to do," he says. "If I can innovate and create and develop new technology, how is that technology going to affect the society that's going to receive it?"

The affiliation allowed Hailemariam to apply such comprehensive thinking to real-world challenges. He was involved in two student competitions that were limited to teams containing NYU students: the Stern Social Venture Competition, which offers a $100,000 prize to students and alumni who use their entrepreneurial skills to come up with innovative solutions to social problems both here and abroad; and the NYU Reynolds/Youth Venture "Be a Challenger Challenge," which offers $1,000 in seed money to 25 teams whose projects benefit the community and a $10,000 prize. (In a separate development, Evangelos Limpantoudis, who will begin work on an MS in construction management this fall, recently became the first NYU-Poly student to receive the Catherine B. Reynolds Foundation Fellowship for Social Entrepreneurship. See page 25.)

Hailemariam's teammates included a Stern MBA student, an NYU undergraduate, and eight other NYU-Poly undergrads. Together, they worked to create innovative technologies for the developing world: the Stern Social team refined solar technology for use in cell phones and other electronic accessories, while the Reynolds team built a web application to help NGOs coordinate and share resources.

None of these opportunities would have been available without the affiliation, says Hailemariam, who also appreciates his

"YOU GET TO INTERACT WITH STUDENTS WHO AREN'T IN ENGINEERING, AND IT GIVES YOU A DIFFERENT PERSPECTIVE, INFLUENCING WHAT YOU WANT TO DO. IF I CAN INNOVATE AND CREATE AND DEVELOP NEW TECHNOLOGY, HOW IS THAT TECHNOLOGY GOING TO AFFECT THE SOCIETY THAT'S GOING TO RECEIVE IT?"

- Michael Hailemariam '10CBE
2010 Outstanding Graduate

newfound ability to use the databases in NYU's library system to perform research and analysis for his teammates. NYU and NYU-Poly students can now use their ID badges to gain access to most facilities at either institution, including libraries, student centers and bookstores. NYU-Poly's counseling and psychological services have been supplemented by NYU's, as well. In addition, NYU-Poly alumni can enjoy special events, club memberships, access to NYU libraries and discounts for car rental, hotels and travel.

> "Inventing new technology is the only way we're going to solve global issues like climate change, healthcare and job creation."
>
> *- Jerry Hultin*

Over time, NYU-Poly's own facilities will also profit from the affiliation. The $50 million that NYU has made available for both faculty hires and campus upgrades will help expand its research laboratories, modernize NYU-Poly's classrooms and provide innovative workspaces for faculty and student collaboration. And those improvements are just part of a larger redesign, "i²e Campus Transformation," that will play out over the next 10 years; sustainability is a driving principle, and the Jonathan Rose Companies, a "green" real estate policy, planning and development firm, acts as the owner's representative for the school.

As that decade-long timeline suggests, the effects of the affiliation on NYU-Poly's physical plant, as on so many other aspects of the institution, have only just begun. For all the benefits that have already materialized, the best is yet to come "We've accelerated the strategic growth of Poly and given NYU a strong engineering partner. And that's not just good for NYU and NYU-Poly," says Hultin. "Inventing new technology is the only way we're going to solve global issues like climate change, healthcare and job creation."

Thanks to the affiliation, he adds, "– i²e is going to have a lot of power in the 21st century."

160 Varick Street, the Manhattan incubator that NYU-Poly launched in partnership with New York City and Trinity Real Estate.

OUR NEW WORLD NUMBERS

36%

Students coming from outside of Poly's traditional geographic recruiting area

57

Countries

37

States