Students Benefit From Stimulus

CUNY will receive larger Pell and work-study grants, and funds for shovel-ready construction projects, as part of the stimulus package signed by President Obama.

“We’re pleased that some of that money is going to be coming to New York State and will benefit SUNY and CUNY,” Chancellor Matthew Goldstein told the Feb. 23 Board of Trustees meeting. Specific allocations were being decided in talks with the state Division of the Budget and the Legislature.

Irwin Weinschall, vice chancellor for facilities planning, construction and management, told the Trustees that Gov. David Paterson wanted to see infrastructure projects that met federal criteria that the funds be used within 120 days and meet “green” standards. “We’re ready with our projects,” she said.

Continued on next page ➤

Workforce Development Now!

O N A FRIGID DAY in January as the reality of vanishing jobs was setting in, a New York City Council committee convened a hearing on a timely, if urgent, subject: workforce development. First up to testify were four CUNY educators, and no wonder. New Yorkers turn to CUNY’s vast network of continuing education programs when they seek new skills, credentials and careers, and demand is on the rise.

The City University of New York registered 270,000 continuing education students last year, and with courses, certificates and degrees offered throughout the University in everything from basic skills prep to asbestos abatement to nursing, teaching, and “green” technologies, the University is poised to play a critical role in re-shaping New York’s current and future workforce.

But CUNY strengthens the economy in ways that far exceed even the challenge of helping to educate and train a 21st-century workforce during a recession. From its historic and continuing role as educator of immigrant and low- and moderate-income New Yorkers, to its resurgence as an institution that attracts renowned researchers and high-achieving students, to its leadership in mobilizing needed support for public higher education, CUNY is critical to New York’s economic life.

“CUNY is one of the state’s most powerful economic development engines, from the high-quality, affordable college education we provide, to the cutting-edge discoveries unfolding in our labs, to the ongoing economic stimulus provided by CUNY students, faculty, staff and graduates who study, work, live, buy and pay taxes here,” said Chancellor Matthew Goldstein.

“New Yorkers know that CUNY represents educational value, and in a challenging economy, there is increased demand for our programs and services,” Chancellor added. “We are providing the highly educated and skilled workforce the City, State and nation needs to remain competitive.”

CUNY recently responded to the economic downturn with new innovations by reaching out to financially ailing New Yorkers. In December, the University partnered with the city Department of Consumer Affairs and the New York Daily News for a week-long public service call-in, the “Your Money Help Line,” staffed by 550 CUNY.

Continued on next page ➤

“Open the doors to all — let the children of the rich and the poor take their seats together and know of no distinction save that of industry, good conduct, and intellect.”

Theodore Harris, Founder

SPRING 2009

Inside

CUNY’s Decade of Science

From nanotechnology to environmental sensing — here’s a look at groundbreaking research by some of CUNY’s cutting-edge scientists.

PAGE 7

Building for New York’s Future

BMCC’s 9/11-damaged Fiterman Hall in Lower Manhattan will be replaced and in East Harlem, a new home will be built for Hunter’s School of Social Work and a new School of Public Health.

PAGE 11

Rx for More Nurses

The University finds innovative ways to keep the caring profession off the critical list.

PAGE 12

Putting Student Award Winners On the Fast Track

CUNY steps up efforts to promote talented students for top awards and scholarships — students like Andrew Santiago, who is reaching beyond his troubled past with the help of the Kaplan Educational Foundation.

PAGE 13

The Futurist

Prof. Michio Kaku explores time travel, invisibility and other not necessarily unreal phenomena in his recent book, Physics of the Impossible.

PAGE 14

PUTTING THE STUDENT FIRST

Creating Jobs, Opportunity: University projects like the Battery 600,000-square-foot vertical campus at John Jay College of Criminal Justice are changing the economic face of jobs for New York.

PAGE 10
CUNY Gears Up For New Challenges

This has been a difficult year in our country, our state and at CUNY. More than ever, economic conditions demand that all of us, together to protect the most vulnerable and to enable New York State to recover and ultimately invest in its future. As a key generator of workforce and economic development, and the producer of a highly educated citizenry, the University has a pivotal role to play in recovery efforts CUNY is unique among public universities in New York. Demand as New Yorkers look to gain new skills and reshape careers. Our enrollment is at its highest level since 1973, 4.8 percent increase over last year. There are significant increases in the School of Medicine for Spring 2009, and in the number of full-time Fall 2009 applications.

The University’s ability to serve more high-achieving students. The Macaulay Honors College had its largest number of applicants ever for its class of 2012; those admitted have average SAT scores of almost 1,600. This fall, Macaulay student David Bauer of City College was one of 32 Americans awarded a 2009 Rhodes Scholarship. Graduate School enrollment was up 14 percent in five of the last six years. The 2009 Princeton Review lists CUNY’s top 100 “Best Value” colleges ranked Honors Graduate Studies at 82 of the 250 prestigious public institutions. Baruch, Brooklyn and Queens Colleges were among the top 50. Macaulay Honors graduates possess the skills and credentials that a CUNY education offers, and we are committed to building the facilities, faculty and energy our graduates add to New York’s workforce. A growing student body requires more resources, and as an example, we must continue to build our full-time faculty. The last time CUNY’s enrollment was this high, the University employed more than 11,000 full-time faculty, and 16,000 staff.

The University’s 2009-10 budget request focuses on providing the full-time faculty and programs students of New York need to compete in this economy. That means supporting the best and most innovative programs. Our request was based on the CUNY Compact model of funding, a partnership of not only state and city governments but also the University, CUNY’s friends and donors and CUNY’s students.

The State Executive Budget recommends $1.9 billion for CUNY’s senor college enrollments and additional student support of almost $63 million, offset by more than $135 million from additional tuition revenues. This growth is based on tuition rate increases of 15 percent, state aid increases of 17 percent, full-time undergraduate students and 20 percent for graduate students. For the first time in state history, the budget calls for 20 percent of the tuition revenue increase to be retained by CUNY for investment in core activities, increasing to 50 percent as the state economy improves. This is an important step which moves toward the investment called for by the compact model. At the same time, the CUNY Compact has called for a tuition policy that seeks to keep increases at a modest level.

The Executive Budget proposes a $20-million University-wide reduction to our senior colleges in non-core activities and a reduction in community college support by one-third per PTP by $270 for the current year that would continue into FY2009-10. For CUNY, this equates to about $4 million in the current year and $18 million in 2010-11. Particularly in times of financial distress, New Yorkers turn to our community colleges for academic, professional development and training opportunities. CUNY’s six community colleges—now serving more than 81,000 students, an increase of more than 6 percent since last year—offer high-quality learning opportunities to meet a wide range of needs. Their capacity will be severely tested in the coming year.

Many CUNY campuses are in disrepair and need modernization. Last year fund- ing was provided for critical-maintenance projects at LaGuardia and LaGuardia and community colleges, and this year the Executive Budget recommends another critical-maintenance allocation. We appreciate this recognition of our needs. However, several important projects at CUNY colleges across the five boroughs were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency.

Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency.

Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency. Federal investment in public higher education is shrinking, and Governor Patterson included higher-education projects among those that were not included in the budget, from science facilities to student and classroom centers. As enrollment grows, these projects take on special urgency.
Training to Research, CUNY Generates New York $$$

At the City Council Higher Education Committee hearing in December, LaGuardia’s dean for workforce programs, Sandra Watson, illustrated the business development assistance CUNY provides. “Marie L.” and “Dominique” had dreamed of opening a day care center, Watson said, but as the financial crisis was rapidly unfolding, getting start-up financing was difficult despite their strong credentials. The LaGuardia Small Business Development program helped them rework their business plan, find a lender and deal with the application process, and they were approved for a $120,000 loan in November. They expect to open Little Children’s Garden Inc. in Flushing, this spring.

LaGuardia, working with government, business, community organizations and other groups, “is a major partner in New York City’s workforce development system and is poised to have a greater impact on the system in the coming years,” Watson told the Council.

Investment in CUNY has been essential to the University’s rising reputation for academic excellence and cutting-edge research. The University, by pioneering the CUNY Compact model of financing the system through a partnership based on government support, private giving, student tuition and CUNY institutional efficiencies — has made itself a more powerful economic development engine. And that has attracted critical investment — from National Science Foundation grants to CUNY students to private donations that have supported creation of high-end CUNY institutions and programs.

Such successes are drawing increasing numbers of high-achieving students, as well as cutting-edge researchers, to the University. Chancellor Goldstein’s Decade of Science initiative is strengthening the University’s science programs, and CUNY has expanded Ph.D-granting authority in the sciences to two senior colleges, to make the University more competitive in the quest for research funding.

CUNY’s national reputation as a research hub is growing. The planned construction of the Advanced Science Research Center on the City College campus, and other science buildings around CUNY, is expected to create thousands of construction jobs. But what goes on inside CUNY’s labs — from medical discoveries to energy innovations — also has economic implications.

For every $1 million spent on research in New York State, an estimated 12 new jobs are created, according to the 2007 report of the New York State Higher Education Commission. Then there is the research itself, generating important advances in health and medicine, and energy and sustainability.

At City College, electrical engineering Prof. David Crouse, director of the CUNY Center for Advanced Technology in Photonics Applications (CUNY CAT), is involved in the emerging field of metamaterials, used to develop electrical contacts that will increase the efficiency of silicon solar cells without increasing their manufacturing or operating costs.

Dr. Sanjoy Banerjee, distinguished professor of chemical engineering at CCNY and director of the CUNY Energy Institute (and formerly of The University of California system), is studying ways to efficiently store and transport electricity from renewable sources such as sun and wind, for potential use in large electric energy-efficient transportation.

In cancer research, award-winning Dr. Jill Burgi-Melguizo of Hunter College has focused her investigations on the p53 protein, which assists in the suppression of tumor cell growth. Queens College biochemistry and chemistry Prof. Robert Engel is developing new, durable, non-toxic, metal-free antimicrobial compositions that guard against bacteria and other threats, and can be embedded in products such as building materials, clothing, paints and packaging.

CUNY and the national economy

— Chancellor Goldstein’s longtime concern about funding and other challenges faced by CUNY and other public universities — such as competition from well-endowed private institutions for highly qualified faculty and funds — sparked discussions last year with the Carnegie Corp. and the boards of other large U.S. public university systems, leading to a “Summit on Public Higher Education” in New York last October co-hosted by the Chancellor and Carnegie Corporation President Vartan Gregorian.

The Carnegie Corporation in December published “The Higher Education Investment Act: An Open Letter to President-elect Obama and His Administration,” in The New York Times. Signed by the presidents, chancellor and board presidents of 33 state university systems, it emphasized the essential role of public higher education in tough times, and committed the universities to be part of the solution. The letter asked that stimulus money be allocated to states for shovel-ready, higher-education infrastructure projects, to upgrade campuses to educate Americans for the 21st century, and to create construction and other jobs to shore up the economy.

CUNY’s $1 billion in planned construction, slated for much-needed science labs, critical maintenance and other building projects — such as the 13-story, 600,000 square-foot building rising at John Jay. College of Criminal Justice — could create nearly 14,000 construction and off-site jobs, according to Iris Weinshall, Vice Chancellor for Facilities Planning, Construction, and Management.

With private development waning because of the economic meltdown, public projects “will retain many of the construction jobs we have learned to depend upon during the last 10 years of the building boom,” Weinshall said.

The mandate to prepare students for the jobs of the future is at the heart of the Chancellor’s proposal for an innovative, new community college in Manhattan, one that would require full-time enrollment, focus on math and literacy, and limit majors to fields that have a future, such as health care and environmental technology.

For low- and middle-income New Yorkers, CUNY has been, and will continue to be, the higher education vehicle of choice for reaching and staying in the middle class.

Chancellor
Matthew Goldstein
Foundations, Donors Invest in CUNY

One of the many foundations that has supported CUNY students is the Jack Kent Cooke Foundation, which assist exceptional students with difficult financial circumstances. Since 2002, five CUNY students have won its coveted scholarships, and one of them, Yeshey Pelzom, an undergraduate recipient, recently received the award for graduate study. The scholarships provide up to $40,000 for undergraduate study and as much as $300,000 for graduate work.

As a political refugee from Bhutan, Pelzom, 36, spent 10 years in Nepal before coming to the United States in 2000. She won her Cooke transfer scholarship when she was a student at LaGuardia Community College, which she used to earn a bachelor's degree with honors at Queens Scott College in Atlanta.

Her biggest challenge so far has been culturally balancing her role as a student, wife and mother. "Although my thoughts are no longer limited to what I should cook for the next meal or if my husband and son have clean socks, many times I find myself having to overcome the social stigma of being a married woman going to college," she said. "Being a student of English literature does not help." Undaunted, Yeshey has found English literature to be not only liberating but also empowering. "I have succeeded in making myself a role model to my fellow immigrants, and I have become the first woman in my community to go to college," she added.

Although Yeshey has not decided where she will attend graduate school, she eventually plans to become a professor and an advocate for human rights. Yeshey is also a recipient of a Phi Theta Kappa scholarship, the Isadore Newman Preston Prize for Fiction, and the George Groman Award for Analytical Writing.

Another recent Cooke foundation recipient is Rojo Wallace, a 2008 Bronx Community College valedictorian who is pursuing a master’s degree in anthropology in the African Diaspora Studies program at the University of Texas at Austin. This second-generation Haitian immigrant (her mother also graduated from Hunter) found that Haitian immigrants in Paris do not seem to identify as a homeland group as they do in the United States, and she is exploring why.

And there are public-spirited philanthropists who are not alumni. Take Elias Karmon, known as "Dr. Bronx," who endowed the Bronx CUNY Scholarship Fund, which supports financially needy students at the three Bronx colleges (Lehman College and Bronx and Hostos Community Colleges); preference goes to Bronx residents.

Karmon, who died in October 2008, graduated from New York University in 1932 at the height of the Great Depression. His clothing store lasted decades, and he made custom suits for judges, politicians and such Bronx residents as saxophonist Benny Carter and former Secretary of State Colin Powell. As the neighborhood became increasingly black, he was an advocate for African-Americans and was active in many organizations that assisted minorities.

One scholarship recipient Karmon helped is Danyill Rodrigues, an early childhood education major at Bronx Community College who expects to graduate in 2009. “I am the first person in my family to go to college. Education was always a priority in my house because my mother wanted me to have a successful future,” she said.

Another Karmon beneficiary is music major Yosena Ortiz, who expects to graduate from Lehman in 2009 and intends to pursue a doctorate, teach, and direct and write musicals. She taught dance and piano for 10 years before enrolling at Hostos, where she earned her bachelor’s degree.

Several CUNY alumni have won National Science Foundation grants for graduate study. Mathematician Joseph Hirsh (Queens and CUNY Honors Colleges, 2008) is pursuing a doctorate at the CUNY Graduate Center where, as an undergraduate, he took 10 courses. He won the Queens Math Department’s Thomas Brown Memorial Award for the highest-achieving junior.

Molly Cohn (Hunter 2007) is pursuing a doctorate in social anthropology in the African Diaspora Studies program at the University of Texas at Austin. This second-generation Haitian immigrant (her mother also graduated from Hunter) found that Haitian immigrants in Paris do not seem to identify as a homeland group as they do in the United States, and she is exploring why.

And with his NSF grant, Yisa Rumala research into the nation’s largest energy-only private fund “This is a state institution,” she said. Macaulay, who grew at fellow alumni. Some of the drive’s leaders have gone to find sponsors, including going to find sponsors, including many recent graduates are beginning to build on the generosity of past and present philanthropists. “There is a continuing commitment that increasing numbers of our alumni and donors and community leaders have to support the success of the University,” Chancellor Matthew Goldstein said. “And the support that our students receive from government and foundations underlies the quality education that our talented students receive.”

Thunderstorm Studies

AGUARDIA CC student Ernesto Rivera was the only community college representative among 10 CUNY students to participate in a major faculty-supervised student research project funded by a $450,000 National Science Foundation grant. The 25-year-old liberal arts/math and science major has teamed up with Obcle Leslie, a student from York College, and Professor Brian Van Hall of CCNY, to study and research remote sensing as it applies to thunderstorm forecasting, which is the prediction of storms within a short time before their occurrence.

Psychology Award

SARAH KOPELOVICH, a second-year graduate student in the CUNY Doctoral Program in Forensic Psychology at John Jay College of Criminal Justice, has won the prestigious American Psychological Association National Convention Research Award. She was honored for her research project that deals with the hazards of overdependence on voice identification testimony, the parameters of the cross race effect in voice identification testimony, and the reactions against the highbrow use of multiple independent identifiers.

CSFI Film Festival

TWO GRADUATE STUDENTS in the College of Staten Island’s Master’s program in Cinema Crafts Studies were selected to take part in the 56th annual San Sebastian International Film Festival in San Sebastian, Spain last September as part of the festival’s International Scholars Program at IBM's T.J. Watson Research Center in Hawthorne, N.Y.

Vanguard Tech Award

EHMAN COLLEGE senior Lilliana Cambi is one of only nine students nationwide to receive Vanguard’s 2008 Women’s Information Technology Scholarship Award. Cambi is participating in the IBM-Lehman College Internship Program at IBM’s T.J. Watson Research Center in Hawthorne, N.Y. and plans further study in management information systems. She received $8,000 to cover tuition, books, and supplies from Vanguard, which awards merit-based scholarships to female college seniors.

They are following the lead of William Macaulay (City College 1966) and his wife, Linda, who donated $30 million to buy and transform a century-old Manhattan townhouse into a home for the CUNY Honors Colleges, which draws students from seven campuses.
Hunter Professor Emerita
A MacArthur ‘Genius’

MORE THAN four decades ago, when Nancy G. Siraisi had two small children and an entry-level job, she decided that she wanted to pursue a PhD in medieval history. “I’m from England, and I had a degree from an English University, and I had no intention to pursue other degrees,” said Siraisi, Hunter College’s distinguished professor emerita of history. “It found it difficult to work full-time, I wanted to shift to teaching, and I needed graduate courses.”

She enrolled in a history course at Hunter College. Her instructor was professor Pearl Kibre, a scholar in medieval studies. “She said that I knew a little Latin, and she immediately told me that I must enroll in a PhD program,” Siraisi said. “She was a woman of great force of character, and I did so I have never regretted it.”

Kibre was right: Siraisi, a historian of late Medieval and Renaissance medicine, is one of 25 recipients of the 2008 John D. and Catherine MacArthur Foundation’s prestigious “genius awards” that are presented annually to individuals for creativity and contributions to their fields. “Professor Kibre was a historian of considerable eminence, and what helped me was her encouragement,” Siraisi said. “The Graduate Center also gave me practical help that I can’t imagine I could have gotten anywhere else.”

Siraisi and her husband were “very modest means,” so the Herbert H. Lehman Fellowship she received made it possible for her to continue her studies. She earned a doctorate in history from The Graduate Center in 1970 and for more than three decades taught history at Hunter and The Graduate Center. “I can’t remember how much the fellowship was, but it was the same or slightly higher than what I was making in my editing job, plus the University was tuition-free at that time,” she says. “I really do owe my entire academic career to CUNY.”

At 76, Siraisi plans to continue her studies. “I have several projects, but I also see it as a validation of the work I’ve done already.” The $500,000 award to pursue research.

Inside Look at NYC Criminal Justice

STUDENTS AND RESEARCHERS will get an insider’s look into New York City’s criminal justice system via an ongoing oral history project conducted by John Jay College of Criminal Justice and funded by the Lynn and John Kroll Foundation.

Tune In to Talks on First Atom Bomb

The Graduate Center this fall hosted five symposia about the science, people and ethics of America’s drive to develop the first atom bomb, an effort that — with the incursion of the Japanese cities of Hiroshima and Nagasaki — hastened the end of World War II. The discussions surrounded the Metropolitan Opera debut of “Doctor Atomic,” composer John Adams’ provocative work about J. Robert Oppenheimer, the physicist who managed the scientific drive to build the bomb.

Simone Lamont Leads Student Senate

SIMONE LAMONT, a York College student pursuing a B.S. in mathematics, has been elected the 24th chairperson of the University Student Senate. She has devoted the past three years to representing the needs of CUNY students, including as vice chair of senior college affairs, working to develop a forum for ideas and communal action plans among campuses.

As an international student, Lamont has been an active advocate for international students’ rights on her campus. While serving as the president of the York College Student Government Association, she lobbied for an office space for dealing with international students’ interests. She also has been alumni liaison for student government.

She hopes to become an educator, and believes that higher education should be accessible and affordable to all.

CUNY Matters — Spring 2009 | 5
Look Who’s INVESTING in CUNY!

THE NATIONAL SCIENCE FOUNDATION

THE NATIONAL SCIENCE FOUNDATION’s highly competitive Graduate Research Fellowships support exceptional students whose cutting-edge research shows clear evidence of contributing to important scholarly knowledge in their fields. Outstanding CUNY winners include, from left, Yisa Rumala, York College 2006, University of Michigan 2012, M.S. Electrical Engineering, Ph.D. in Applied Physics; Joseph Hirsh, Macaulay Honors College at CUNY 2008, CUNY Graduate Center 2012, Ph.D. in Mathematics; Mitsy Chanel-Blot, Macaulay Honors College at CUNY 2008, University of Texas 2012, M.A.-Ph.D. in Social Anthropology.

“T he National Science Foundation and far-sighted private foundations know the value of quality public higher education. They are financing schools and programs, supporting scholarly research by world-class faculty, and endowing student scholarships at every college of The City University of New York. They are answering CUNY’s call for a Compact for Public Higher Education that unites all stakeholders — government, donors, students and the University itself—to ensure that our city, state and nation will continue to have well-educated leaders. They are investing in CUNY, investing in New York, and investing in futures.”

— Chancellor Matthew Goldstein

www.cuny.edu/investing  1-800-CUNY-YES
Here’s a look at groundbreaking research by some CUNY scientists—and their revolutionary discoveries.

By Neill S. Rosenfeld

WHAT DO chronic water shortages mean in a volatile and nuclearized region like South Asia? Or in our country when farmers, industry and city dwellers argue over finite water supplies?

These are some of the questions that drive Charles Vörösmarty and his research team to study the state and trajectory of freshwater resources. Hydrology, the study of water in the environment, “is no longer about small units of landscape called watersheds,” he said. “It’s now focused on big, strategic issues, and often those are dictated by humans attempting to control water supplies. We’ve got to be talking about the Northeast Corridor, the U.S. national water policy in light of climate change; and the over-use of water as you’re growing biofuels while trying to feed a hungry world or when water scarcity invokes national security issues.”

Vörösmarty is the first of what will be five nationally known directors whom CUNY is recruiting to run the laboratories at the Advanced Science Research Center, the keystone of CUNY’s Decade of Science (2005–2015). The $380-million, 200,000-square-foot center on the grounds of City College is slated to open in 2012. It will provide $50 million worth of sophisticated equipment to researchers from across the University while becoming a crossroads for scientific creativity.

“I’m looking for ideas about water that no single person could have thought about,” said Vörösmarty, who will direct the laboratory of water and environmental sensing, a field that uses computer analysis and instruments ranging from satellites to ocean buoys to collect data for earth, atmospheric, environmental and marine sciences.

Similar brainstorming is also the goal in the ASRC labs dedicated to the University’s four other flagship areas of science: nanotechnology, neuroscience, photomicroscopy and biological processes.

Chancellor Matthew Goldstein launched the Decade of Science to help position CUNY as a premier research institution. The plan includes more than $1 billion for science facilities on eight campuses; “cluster hires” of more than 80 faculty members so far in science, technology, engineering and math; restructuring Ph.D. programs in the sciences and engineering; boosting financial aid for doctoral students; and training more teachers of middle- and high-school science and math.

Although the United States has yet to adopt a national approach to managing carbon and climate change, Vörösmarty believes in “regional ecomanagement, and the only way to do that coherently is to take a multistate perspective and make water a part of the dialogue.”

His viewpoint is broader still. He has consulted for the 24-agency UN World Water Assessment Programme and represented the International Council of Scientific Unions at the UN Commission on Sustainable Development. “I’ve opened a dialogue with the U.N. on how to better manage water in the 21st century. Our CUNY initiative is perfectly poised, because of our location, to be a central force in that dialogue.”

He looks forward to working with the many CUNY professors who study environmental issues, including “the powerhouse in remote sensing and geospatial data-set integration” that is NOAA-CREST (Cooperative Remote Sensing Science and Technology Center), a multidisciplinary consortium led by CCNY and sponsored by the National Oceanic and Atmospheric Administration. It includes four CUNY institutions (CCNY, Lehman College, Bronx Community College and New York City College of Technology). Booise State University, Columbia University, Hampton University, the University of Maryland, Baltimore County, and the University of Puerto Rico at Mayaguez.

“I’m amazed at the strength here at CUNY, but that strength sits on many different campuses,” Vörösmarty said. “Our intent is to use ASRC as a magnet to draw those otherwise disparate students and professors together in an interdisciplinary research framework, in particular in reaching out to our next generation of students.”

He sees the ASRC lab as “an incubation vessel for ideas, for the gee-whiz stuff that we can turn on its ear and apply to the environment.”

Here is a look at some of the other scientists working in each of the University’s five flagship areas of science.

ENVIRONMENTAL SENSING

The collection of data about the atmosphere, earth and living creatures, often via remote devices.

FOR THE PUBLIC, the most familiar environmental sensing is visible, from pictures of melting glaciers to TV graphics of howling hurricanes. But it’s the invisible — what’s in the air — that interests Fred Moshary, a professor at City College’s Grove School of Engineering.

“On the health side, the main thing we’re looking for is pollution,” he said. “On the environment side, aerosols [liquid or solid particles] figure into global warming because they represent a cooling, not a warming, effect. When you’re studying global warming, you have to look at the overall energy balance.”

Curtailing global warming or meeting prospective environmental regulations are “difficult, high-stakes issues, dealing with them will be disruptive and expensive,” he said.

New York City, for instance, falls short of national ambient air quality standards, and it could prove prohibitively
The approach this could overcome a weakness in nanotechnology today, the difficulty in aligning parts of the tiny machines. “You can’t pick up a nanoscale device and put the wires in the right places, but if you direct this wire to go to this place and attach itself, then it will do. It sounds difficult, but that’s how humans are made,” he said.

Matsui is exploring how to use this technology to create sensors that, depending on which antibody is attached, would spot a specific virus or bacterium. “You could have a simple tabletop diagnostic device that could quickly tell you if you are infected [via an electric signal]. This could be of tremendous value in remote places where you don’t have sophisticated instruments,” he said.

Beyond detection, “we’re trying to make this a diagnostic system,” he said. “We are finding that the electric signal depends on the strength of the viruses, so the signal level could tell us the strain. That’s what we’re hoping for.”

Matsui trained as a physical chemist and stumbled into this research when a graduate student made a mistake in synthesizing a known molecule. Back then, Matsui was interested in how nature assembles a molecule into a certain shape. His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

“The electric signal is sent along with the peptide, and when it gets to a single cell, some programming instructions and, generally speaking, you get a smoothly functioning and complex activity. This is to nerves what bones are to the body, to get nerves to regenerate,” she said.

Filbin is frustrated that major pharmaceutical companies have dropped their research into nerve regeneration. Perhaps they don’t see a big enough market in this place and attach itself, then it will do it. It sounds difficult, but that’s how humans are made,” he said.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

Akins has made nanomaterials with amazing abilities. A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.”

“With we work with peptides and antibodies,” explained the associate professor of biotechnology at Hunter College’s Chemistry and Biochemistry Department. Peptides, which are chains of two or more amino acids, assemble themselves and can be fashioned into nanoscale wires that function as regular electric wires. And antibodies naturally attach to specific receptors on the peptides.

“We can program it to build complex devices in nanoscale size and move to position A, this wire to position B, and this particle to position C,” Matsui said. “If we use the right antibodies, the wires won’t be misdirected.”

The ability to create a nanodevice could overcome a weakness in nanotechnology today, the difficulty in aligning parts of the tiny machines. “You can’t pick up a nanoscale device and put the wires in the right places, but if you direct this wire to go to this place and attach itself then it will do. It sounds difficult, but that’s how humans are made,” he said.

Matsui is exploring how to use this technology to create sensors that, depending on which antibody is attached, would spot a specific virus or bacterium. “You could have a simple tabletop diagnostic device that could quickly tell you if you are infected [via an electric signal]. This could be of tremendous value in remote places where you don’t have sophisticated instruments,” he said.

Beyond detection, “we’re trying to make this a diagnostic system,” he said. “We are finding that the electric signal depends on the strength of the viruses, so the signal level could tell us the strain. That’s what we’re hoping for.”

Matsui trained as a physical chemist and stumbled into this research when a graduate student made a mistake in synthesizing a known molecule. Back then, Matsui was interested in how nature assembles a molecule into a certain shape. His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

“Before this, almost nobody was thinking about using biological molecules for electronics, so we were almost the sole investigators thinking that crazy way, thinking that the hard-core semiconductor industry could marry with biology. Now many people have that idea,” Matsui said. It’s hard to conceive how small a nanometer is. Web definitions call it 1/80,000th the diameter of a human hair or, at 3 nm, imagine it as a three-inch-thick Post-It Note seen from halfway across the planet. Things 1 to 100 ns are inconceivably tiny. Yet scientists like Daniel Akins have made nanomaterials with amazing abilities.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

“Before this, almost nobody was thinking about using biological molecules for electronics, so we were almost the sole investigators thinking that crazy way, thinking that the hard-core semiconductor industry could marry with biology. Now many people have that idea,” Matsui said. It’s hard to conceive how small a nanometer is. Web definitions call it 1/80,000th the diameter of a human hair or, at 3 nm, imagine it as a three-inch-thick Post-It Note seen from halfway across the planet. Things 1 to 100 ns are inconceivably tiny. Yet scientists like Daniel Akins have made nanomaterials with amazing abilities.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

“A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.

A distinguished service professor of chemistry at City College, Akins has patented an inexpensive way of turning a carbon source like methane into nanotubes, which are bundles of carbon atoms that “have fantastic properties. They’re stronger than steel, conduct electricity better than the best metal conductors and have chemical properties that allow them to attach to specific receptors on the peptides.” His student quickly realized that the peptide he had made was something new, and Matsui discovered that it functions as an electric wire and could absorb biomolecules. That sent him down a different path of research, one that required him to learn a good deal of biology and biochemistry.
supports her research. Or perhaps they just don’t see the future evident in an aging population.

“My argument is that in motor neuron diseases, Parkinson’s, Alzheimer’s or multiple sclerosis, you have ongoing nerve death. You have to arrest the progression of these diseases and, if you want full functional recovery, you’re going to have to replace those lost neurons in an inhibitory environment. Everything we find out about regeneration after injury could be applicable to neuron replacement in degenerative diseases,” Filbin said.

ANXIETY, RAGE, DEPRESSION and brain cancer from an understandable quartet, but for Probal Banerjee they encompass two distinct research projects.

The first examines how the neurotransmitter serotonin governs emotions. “We have shown for the first time that the serotonin 1A receptor in the brain plays a varied role in the early postnatal stages,” said Banerjee, a professor of chemistry, biochemistry and neuroscience at the College of Staten Island.

“In the hippocampus, which controls memory, it helps cell division just before neuronal connections are made. Then it changes its mode of action to help build neuronal connections. We are working out the signal transduction cascade, which is the sequence of events inside the neuron that regulates its electrical activity, cell division and maturation,” he said. “The proteins created or activated can be ‘our therapeu-
tic targets in treating depression and anxiety.’”

The amount of serotonin in the cerebral spinal fluid affects emotions. At normal levels, serotonin is a calming agent, but having too lit-
tle can trigger aggression and emo-
tional problems including depres-
sion and suicidal tendencies.

Banerjee’s team determined that a common drug for schizophrenia, discipine, works through the serotonin 1A receptor, leading him to speculate that “many emo-
tional disorders which surface in puerility are related to serotonin disorders.”

He also studies brain tumors, taking divergent approaches. Normally, the body’s defenses recognize and destroy cells with unusual surfaces. But cancer cells can hide by chang-
ing their surfaces. “By doing genetic targeting, we would be able to activate molecules, which work properly in cells only in specific three-
dimensional shapes.”

...we would alter the surface of the cancer cells in such a prominent manner that the scavenger cells would eat them up.” — Probal Banerjee, professor of chemistry, biochemistry and neuroscience at the College of Staten Island

signals at the single photon level.

And his team is working on photonic-integrated circuits (similar to electronic chips) for ultrastark signal processing, that could lead to optical computers whose speed would surpass current silicon-based circuitry. This and the flexible emitter work are funded by the Air Force Research Office.

Turning to fundamental research, Menon explores three-
dimensional photonic crystals, which can efficiently trap photons. He collaborates with City College chemical engineering assistant professor Ilona Kretzschmar, whose group constructs these crystals using directed self-assembly. Menon evaluates their potential to replace silicon, and “The CUNY collaborative program funds this research.”

He also seeks to understand how light acts in a structure where light emitters are stacked periodically (imagine a dis-
play of oranges). This work is in collaboration with Queens College theorists Leo Deysh and Alexander Lisyanskij; it is funded by the Air Force Office of Scientific Research.

COULD LIGHT PROVIDE more detailed mammograms than X-rays, making surgical biopsies obsolete for diagnosing breast cancer?

Swapan Gayen hopes so. A professor in the Department of Physics and the Institute for Ultradian Spectroscopy and Lasers at The City College of New York, he is the principal investigator of a four-year, $1.36-million grant to evaluate whether near-infrared light (just beyond the visible spec-
trum) can not only detect and diagnose breast cancer but also assay how rapidly tumors are growing.

His team includes CUNY professors Robert Alfano and Feng-Bao Lin, and Memorial Sloan-Kettering Cancer Center Dr. Jason Koutcher. The U.S. Army Medical Research and Material Command Breast Cancer Research Program funds their work.

Current screening methods like X-ray mammography and ultrasound excel at detecting abnormali-
ties, but they cannot diagnose whether they are malignant or benign. For that, physicians need to perform biopsies, anxiety-producing surgical procedures that in 80 percent of U.S. cases do not find cancer.

But using light for mammography is easier said than done.

“The main problem is that light does not go through human tissue as it goes through a glass of water,” Gayen explained. “It’s absorbed and scattered many times, so it’s hard to get a direct image.” However, since normal tissue has different optical and molecular properties than cancer-
ous tissue, and since “we can model how light transts through breast tissues and can measure the different angular orientations and transit times of the light that comes out,” the other end, we should be able to get an interior map of the breast.”

To learn how to do that, Gayen’s team constructs model breasts using samples of tumors and healthy breast tissue. They compare their images made with light to the results of X-rays and MRIs.

Beyond detecting tumors, this research offers hope of diag-
nosing breast tumors without surgery. The researchers will try to measure the rate of tumor growth by monitoring the progress of cancer in animals before tumors form.

They compare their images made with light to the results of X-rays and MRIs.

STRUCTURAL BIOLOGY

The study of the properties and applications of light, or energy whose basic unit is the photon.

PHOTONICS

MAKING PHOTONIC DEVICES flexible and miniatur-
ized opens many possibilities for research and practical applications, said Queens College assistant professor Vincen Menon, one of CUNY’s “cluster hires” in photonics.

“Take flexible display screens, which this one could rival the rigid flat screens that are the high-definition tele-
s. These knot—quadruplexes, they’re called—have the potential to form in telomeric DNA located at the ends of chromosomes.

These knots—quadruplexes, they’re called—have the potential to form in telomeric DNA located at the ends of chromosomes.

WHAT IF YOU COULD HALT CANCER in its tracks by stopping a key enzyme from working when it’s not supposed to? Lesley Davenport, a chemistry professor at Brooklyn College, thinks the solution may lie in the protec-
tive enzyme, 5-tetra
defying unlimited limits that may be found at the ends of chromosomes.

These knots—quadruplexes, they’re called—have the potential to form in telomeric DNA located at the ends of chromosomes.

And quadruplexes, in the laboratory at least, inhibit the action of telomerase. In most cells, the enzyme shortens telomeres with each replication cycle as part of the normal process of cell aging and death. (The exception is in

CUNY MATTERS — Spring 2009 19
reproductive cells, which telomerase protects by lengthening telomeres.) But when this process goes awry, telomerase can trigger uncontrolled replication and cell immortality—cancer, in other words.

Davenport hopes that her basic research can lead to drugs that would lock the telomeres of cancer patients, shutting down the progress of the disease. "We ask simple questions: What drives quadruplex folding, and what are the dynamics of its formation?"

Among researchers who study telomeres and telomerase, she stands out for her expertise in fluorescent spectroscopy. She maps model DNA quadruplexes with the help of specially synthesized, fluorescent probes made of guanine-like residues. (The Nucleotide guanine is a building block of DNA and a main component of telomeres.) Because this guanine is fluorescent, it’s easy to find with optical spectroscopy, even at low concentrations.

"We’ve been asking, Are all guanine positions in the DNA quadruplex identical? We’ve found that they’re not," Davenport said.

She and her research team designed sequences with fluorescent guanines at various points in the quadruplexes and observed how minor changes affect their ability to form knots. In certain positions, the altered guanine makes the quadruplexes fall apart, indicating locations that are vital for quadruplex stabilization.

That’s significant because before researchers can develop drugs to lock quadruplexes, they have to know where to attach the lock.

That brings Davenport to another question: the dynamics and thermodynamics of how it folds. "If we understand how the quadruplexes fold up on itself, then maybe drugs can be designed to make it lock the closed quadruplex conformation and thereby prevent telomerase from binding."

Davenport hopes to develop, test and screen for potential drugs that could keep telomeres tied in their elegant knots in collaboration with Mary Hawkins of the National Cancer Institute, who prepared some of the early fluorescent DNA sequences that she used.

WORKING FROM THE PREMISE that molecular architecture can shed light on function, Roth Stark parses tiny structures that operate within cells, like the pigment melanin that can develop in certain fungi.

Melanin protects fungi, just as it colors and protects human skin. It also can make them virulent, a worry for AIDS patients with fungal infections, said Stark, a distinguished professor of structural biology in the City College Chemistry Department.

Her current projects include studying how fungi create melanin from amino acid derivatives and how melanin attaches itself to fungal cell walls. "In contrast to other ubiquitous pigments like chlorophyll and hemoglobin, little is known about the molecular basis for melanin’s many biological functions," Stark said. "Melanins resist traditional structural analysis because they don’t dissolve in water or crystallize."

Her tool of choice is nuclear magnetic resonance (NMR), which examines nuclei nondestructively, as solids or in solution. By aligning them with a magnetic field, then perturbing the alignment with radio waves, the high-resolution results show the response for each atom of a pigment or protein target, revealing molecular structures and flexibility, two keys to physical function.

Stark, a physical chemist, also explores what happens to dietary fat within animal cells. "As fats are digested, one of the things that they’re broken down into is fatty acids, which typically are shuttled to the cell membrane and the nucleus by protein chaperones. Some of these proteins are found in adipose (fatty) tissue, where they may facilitate signaling related to insulin tolerance," she said.

"We look at these proteins and the small molecules they grab or release, and how the three-dimensional shapes of the proteins are changed either to accommodate a foreign fatty acid that gets in or to push it out. Or one protein may collide with another to effect the fatty acid transfer. Ultimately, we want to understand the basic processes of a human cell in healthy and disease states."

Stark works with NMR equipment at CCNY and at the New York Structural Biology Center, where she is a principal investigator. She also directs CUNY’s Institute for Macromolecular Assemblies. "We now have a virtual institute for structural biology and engineered assemblies with more than 30 faculty teams on seven campuses," she said. The goal is to become a cutting-edge crossroads for scientists making medically important discoveries.

WHAT’S AHEAD: A Science Think Tank

Construction began last fall at the intersection of CUNY’s Decade of Science, a glass-sheathed, $300-million laboratory overlooking Harlem on the south campus of The City College of New York.

When the Advanced Science Research Center opens in 2012, it will be the think tank for the University’s five flagship science programs. It will also offer $50 million worth of esoteric equipment to researchers from across CUNY, ranging from a tabletop atomic-force microscope to instruments to map brain activity. It would have been prohibitively expensive to buy and maintain such devices on more than one campus.

"We designed this research center to promote and encourage University-wide scientific collaboration," said Chancellor Matthew Goldstein. "Gone is the calendar of our professors and doctoral students, we expect that the ASRC will be a crucible for breakthroughs."

The building devotes one floor to each flagship area: environmental sensing, nanotechnology, neuroscience, photonics and structural biology. A faculty task force recommended that the University leverage these areas of existing faculty strength to achieve national preeminence.

"The goal was to identify areas where an investment now would still be of national and international importance 10 or 15 years from now," said Vice Chancellor for Research Gilman Small.

ASRC will house approximately 50 professional staff, including about 30 faculty affiliated with a CUNY campus; their grants will flow through the ASRC, helping to fund its operations. As executive director will run the building and be its chief fund-raiser. A nationally known scientist will direct each lab. PhD-level staff scientists will assist visiting CUNY faculty members in using the instruments. And staff technicians will maintain the devices.

Architects Robert Peck Fox Associates of New York City designed the sleek, five-story, 200,000-square-foot building. Its glass walls will rise above a gray brick footing that echoes the Manhattan schist façades of CCNY’s neo-Gothic north campus. Flat and Associates of Wisconsin, a science facility specialist, is the architect of record and designed the labs.

Three firms also designed an adjacent two-story, 700,000-square-foot science research and instructional building for City College. It will supplement CCNY’s Robert E. Marshak Hall, a 1960s structure that is being renovated.

Anticipating future needs, the University also commissioned preliminary work on ASRC Phase II, which may be built during the next decade. "If all of the five areas in the ASRC really takes off and needs support, we could dedicate space in the Phase II building, or by then new areas of research may emerge where we can make significant contributions," Small said.

Excavation of the bedrock beneath the three buildings will occur simultaneously, but the Phase II site will then be filled in to await construction. That will minimize future interference with sensitive instruments at the ASRC and the City College building, as well as the nearby New York Structural Biology Center. That center is a renowned consortium of premier research institutions, including CCNY.
Building the City’s Future

The UNIVERSITY is building a new East Harlem home for the forthcoming Graduate School of Public Health and Hunter College’s venerable School of Social Work. Also, the city and state have cleared the way to demolish and rebuild Borough of Manhattan Community College’s Fiterman Hall, which was irreparably damaged in the 9/11 attacks. The School of Public Health, slated to open with master’s and doctoral programs in 2010-2011, will be the nation’s only such program focusing on urban issues. “I can think of no better way to communicate the seriousness of our commitment to solving the local community than locating the school in the Harlem community,” said the founding dean, Dr. Kenneth Olden.

“I want our faculty to be engaged in solving real-world problems that are important to the people of this city.” The school has University status with Hunter College. Olden, a cancer researcher, favored community health initiatives when he headed the National Institute of Environmental Sciences and the National Toxicology Program from 1993 to 2005. He was the first African-American to direct one of the 13 institutes then at the National Institutes of Health and previously taught at Harvard. As he begins recruiting faculty, Olden is weighing three global trends: the worldwide migration to cities; the aging of populations throughout the developed world; and the transformation of once-lethal diseases into chronic ones ranging from diabetes to cancers.

“Our vision is to bring together a school in this international city to address these problems. Whatever we learn here and whatever technologies we develop to address the challenges posed by these three interactive forces can be applied around the world,” said Olden.

Hunter’s School of Social Work will occupy most of the new eight-story building on Third Avenue between 118th and 119th Streets, which will have almost 30 percent more space than its 42-year-old home. The existing space at 129 E. 79th St. is leased from Louisa V. and James Eastham of New York and the nonprofit New York Community Trust. They sold the property for $55 million to a developer, the Brooklyn Organization, for $40 million of the proceeds — CUNY’s largest gift to date — will help pay for the new building. The state appropriated $95 million for the rest. The remaining $25 million from the sale will create a perpetual fund for social work grants. In appreciation, Hunter is renaming its School of Social Work after the

Silberman. Occupancy for both schools is slated for 2011.

Meanwhile, Fiterman Hall — structurally damaged when the adjacent World Trade Center collapsed after terrorist attacks on Sept. 11, 2001 — will be replaced by the spring of 2012. The project is troubled by issues from insurance to winning government approval, but in November $225 million in funding, including $159 million from the city, was announced by Chancellor Matthew Goldstein, Mayor Michael Bloomberg, Assembly Speaker Sheldon Silver, Manhattan Borough President Scott Stringer and Paul T. Williams Jr., executive director of the Dormitory Authority of the State of New York, representing Gov. David A. Paterson.

“This site is an essential part of the revitalization of Lower Manhattan and of our vision of making Manhattan a vibrant 24/7 community,” Bloomberg said.

The 14-story tower — bounded by Greenwich Street, Barclay Street and Park Place — will have slightly more floor space than the 15-story building it replaces. The agreement comes as enrollment at the University’s six community colleges is at record levels, enrollment at BMCC alone recently exceeded 20,000. To meet the demand, the University is examining the idea of creating a seventh community college. A special task force formed in 2008 and charged by the chancellor to “imagine community-college education from the ground up” has released a concept paper that draws upon the existing schools’ most innovative practices while suggesting policy changes to free educators to do their best work. The panel’s complete report is available at www.cuny.edu/news.

Early Detection and Treatment of Diabetes

Professor of Chemistry Shuin Zhou of the College of Staten Island received a three-year $178,645 grant from the U.S. National Academies to support biomedical research aimed at the early detection and treatment of diabetes. The project, which is being led by Muhammad Siddiq of Pakistan’s Quaid-i-Azam University as part of the Pakistan-U.S. Science and Technology Cooperative Program. Smart polymer microgels, the focus of the project, are useful in biomedical applications; they can be responsive to environmental stimuli, such as changes in temperature, pH and glucose concentration, notes Zhou. It is this last change, in glucose level, that allows these polymers to be potentially useful in the early detection of diabetes and the treatment of the disease through the self-regulation of insulin delivery.

Developing New Methods to Detect Prostate Cancer

Wubao Wang, a senior scientist at City College’s Institute for Ultrasonic Spectroscopy and Lasers, received a three-year $542,941 grant from the U.S. Army Medical Research and Materiel Command for a project to develop novel methods to detect prostate cancer. Wang and collaborators from the University and Dr. James Eastham of Memorial Sloan-Kettering Cancer Center are developing a rectal near-infrared light-based scanning polarization imaging unit and independent component analysis algorithm to improve current diagnostic accuracy.

In Brief

John Jay College of Criminal Justice

More than $1.5 million in federal funds for research initiatives concerning emergency response to large-scale disasters, gang violence and crime prevention, sex-offender management, domestic violence and public safety leadership.

The College of Staten Island

The College of Staten Island $1 million from the U.S. Department of Education for a comprehensive program to improve teacher quality, $20,000 from ConEd to enlist CSI students and faculty to help children and teachers run a greenhouse at PS 35 on Staten Island’s North Shore.

Hunter College

$359,534 from the New York State Education Department to establish a Manhattan/Staten Island Bilingual Education Teacher Assistance Center, $154,495 from University of California-Los Angeles/Autism Speaks for research promoting communication skills in toddlers at risk for autism.

Kingsborough Community College

$304,632 from the Centers for Disease Control and Prevention for minority HIV/AIDS research, $124,247 from the New York State Education Department for a project promoting health careers.

Queens College

$372,189 from the National Institutes of Health for research on predictors of Attention Deficit Hyperactivity Disorder in preschool children, $236,958 from the National Science Foundation for a project to understand the tectonic and stratigraphic history of offshore New Harbor in Antarctica’s Ross Sea.

City College

Two grants totaling $430,488 from the National Institutes of Health for a biomedical cancer research partnership with Memorial Sloan-Kettering Cancer Center, $485,683 from the NIH to create a national urban model for minority undergraduate biomedical education.

The Graduate School and University Center

$528,970 from the National Heart, Lung and Blood Institute for a project on imaging in biological 3D electron microscopy.

LaGuardia Community College

$574,930 from the U.S. Department of Education for a project to reinvigorate second-year education, $504,353 from the New York State Education Department for a family literacy program.

Lehman College

$163,000 from the National Institutes of Health for a project to improve care for terminally ill children and their families.

Medgar Evers College

$231,000 from the New York City Department of Youth and Community Development for a program for out-of-school youth.
For college students, the uncertainty of the economy has aggrandized an age-old dilemma: How do I merge my need for a decent-paying job with a desire to do good in the world?

For many, the answer has the resonance of a healthy heartbeat. "You see, nurses are in demand," notes Edilberto Calamanan, a 55-year-old immigrant from the Philippines who earned his associate's degree in nursing from LaGuardia Community College in December 2007. Calamanan, an even-tempered man who loves helping people, began working at Elmhurst Hospital while a student at nearby LaGuardia in Queens. Since then, he has climbed the ladder, earning significant pay raises along the way. A former high school teacher in his native Philippines, Calamanan is proud of LaGuardia, which last year had a pass rate of 84.7 percent for its 70 nursing students who took the licensing exam.

"The shortage is pretty much based on a lack of faculty," said Dr. Keville Frederickson, director of the Doctor of Nursing Science Program at the Graduate Center. "The beauty of our program is its creation of a new doctoral program in nursing, the only such public program in the region. According to federal estimates, New York City alone; RNs (Registered Nurses) make up the largest single category within the industry, comprising 15 percent of those jobs. But with that strength comes a concern. According to federal estimates, New York City will have a shortfall of almost 37,000 nurses by 2015 — and nationally a shortage of a million nurses is anticipated by 2020. New York State legislators are calling for action to boost enrollment at college nursing programs, which the University sees as a challenge and an opportunity."

According to Dr. William Ebenstein, University Dean for Health and Human Services, the University in the last five years has graduated more than 3,500 nursing students who went on to pass the NCLEX. And the number of nursing graduates (from LPN, or Licensed Practical Nurse programs, as well as associate, bachelor’s and master’s programs) almost doubled from 844 in 2003-04 to 1,610 in 2007-08.

Today 13 colleges offer nursing programs, with three — College of Staten Island, Hunter and Lehman — offering master’s degrees in various specialties. Lehman College in the Bronx has had nursing students since its opening in 1968 and is proud of its efforts to turn out nurses who can work easily in the city’s diverse communities. Lehman has a program that trains immigrants who have received a nursing education overseas,-schooling them in English and other necessary skills. Thanks to a Robin Hood Foundation grant, Lehman has been working with about 20 such immigrants a year. Graduates are passing the licensing exams at a rate of about 80 percent, according to Michael Paull, Dean of Adult and Continuing Education.

The college also has an "MD to RN" program aimed at "doctors who had been trained abroad and who were working out of title in this country, doing anything from medical technology to more menial tasks," Paull said. Lehman turns those doctors into nurses with American bachelor’s degrees. The problem of finding good nursing professors is compounded by the fact that the recommended student-faculty ratio is a low, 10 to one. This means that the average associate-level nursing course will cost $6,800 per student, as opposed to $2,400 per student for a non-nursing class. Another costly feature of nursing education is the laboratory. The simulation labs at Queensborough Community College, Borough of Manhattan Community College and New York City College of Technology are especially outstanding. According to City Tech’s website, its laboratory "contains hospital and home health equipment, training mannequins, and basic medical supplies that simulate the clinical/home setting and help students learn a variety of skills."

Nursing education has gone through enormous changes since the mid-20th century when some of the oldest current practitioners were trained. Back then, the teaching and certification came through hospitals and other so-called diploma institutes. But by the 1960s, a realization developed that nurses — like professionals in other fields — needed a broader intellectual grounding. So colleges took up the call to provide skills that went considerably beyond on-the-job, the-nurse-goes-here lessons. Hospitals and other healthcare institutions now determine placement and promotion, in large part, on the degree level of candidates.

Calamanan, the associate’s degree holder from LaGuardia, says he very likely will pursue a master’s degree while he works in a medical-surgical unit at Elmhurst Hospital. Having recently passed his registered nurse exam, Calamanan moved from a yearly LPN pay base of about $35,000, to an RN base, where the average annual salary can exceed $70,000 in the city. The average annual income of 1997-2007 CUNY graduates currently working as licensed RNs is $73,747.

As a male, Calamanan is among a distinct minority in the nursing field. Of the three dozen or so students enrolled or accepted into the University’s doctorial program, only two are men, program director Frederickson said: "Men are afraid to go into nursing because it’s seen as a very caring, nurturing profession, and those are seen as feminine traits," he said.

But one would think today, with lines blurring between science and art, that men as well as women would see the beauty of a profession that a famous practitioner, Florence Nightingale, described this way: "Nursing is an art; and if it is to be made good, it requires an exclusive devotion, as hard a preparation, as any painter’s or sculptor’s work…It is one of the Fine Arts, I had almost said the finest of Fine Arts."

### University innovations to meet expected future needs include retraining medical specialists and creating new faculty researchers.

### Reviving the Heart of Nursing

### Nursing students at Borough of Manhattan Community College (above) and LaGuardia Community College (below) are preparing for careers at New York City medical centers, where the need for highly skilled nurses is great. LaGuardia's graduates scored highest statewide on the 2007 licensing exam.

### "Today 13 colleges offer nursing programs, with three — College of Staten Island, Hunter, and Lehman — offering master's degrees in various specialties."

### "For college students, the uncertainty of the economy has aggrandized an age-old dilemma: How do I merge my need for a decent-paying job with a desire to do good in the world?"

### "You see, nurses are in demand," notes Edilberto Calamanan, a 55-year-old immigrant from the Philippines who earned his associate's degree in nursing from LaGuardia Community College in December 2007. Calamanan, an even-tempered man who loves helping people, began working at Elmhurst Hospital while a student at nearby LaGuardia in Queens. Since then, he has climbed the ladder, earning significant pay raises along the way. A former high school teacher in his native Philippines, Calamanan is proud of LaGuardia, which last year had a pass rate of 97.4 percent for its 70 nursing students who took the licensing exam."

### Today 13 colleges offer nursing programs, with three — College of Staten Island, Hunter, and Lehman — offering master’s degrees in various specialties.
Putting Student Award Winners on the Fast Track

CUNY MATTERS — Spring 2009

Coming of age in the streets and shadows of the city, what Andrew Santiago has lived with — drugs, violence, death — is no unusual; that’s thanks to his own drive and the support of the Kaplan Educational Foundation, the 21-year-old recently found an oasis, a single, rental room in Harlem — “I study, sleep and pursue his goal of becoming a writer.”

“It’s a quiet, it’s mine, and I love it,” says the soon-to-be graduate of Borough of Manhattan Community College, finally uncovering a few of the things most college students take for granted: a bed of his own, safety, and a good night’s sleep.

Santiago and students like him are the diamonds in the rough. Bright, hard-working and likely the first in their family to go to college, they often have little support at home and only a vague understanding of what it takes to launch their academic careers. CUNY officials knew that beyond the University’s honors programs — and the other high achievers, attending senior and community college, who qualify to compete for prestigious scholarships. Now the University is moving forward with new efforts to find students like Santiago and prepare them to compete for national awards.

In November, 70 CUNY administrators from programs for high-achieving students convened at a meeting to exchange ideas on how to find the brightest among CUNY’s many thousands across the University, match them with appropriate awards and mentor them through the rigorous application process.

“There is a range of very talented students at CUNY,” said James Airozo, University director of admission and Financial Aid. “There are my chances, really? I remember when I came home with good grades, and nobody cared.” Santiago said, “I was going to go to school and do it for myself, out of the love I had for my aunt.” At BMCC, “I did the reading, I did the work and I got good grades. It was awesome,” he said. When a professor praised his first paper as “a great piece of writing” and “told me I could do this,” the encouragement was a spark.

Santiago has embraced a variety of genres and has even had a short play produced off-Broadway — an achievement that developed from a contact he made at the Kaplan Educational Foundation. Benn describes the program, which supports students for three years, as “removing barriers ... whether they're academic or personal,” enabling the students to develop academic and leadership skills in preparation for transfer to a bachelor's degree program. The scholars are encouraged to learn various of genres and has even had a short play produced off-Broadway — an achievement that developed from a contact he made at the Kaplan Educational Foundation. Benn describes the program, which supports students for three years, as “removing barriers ... whether they're academic or personal,” enabling the students to develop academic and leadership skills in preparation for transfer to a bachelor's degree program. The scholars are encouraged to learn various of genres and has even had a short play produced off-Broadway — an achievement that developed from a contact he made at the Kaplan Educational Foundation. Benn describes the program, which supports students for three years, as “removing barriers ... whether they're academic or personal,” enabling the students to develop academic and leadership skills in preparation for transfer to a bachelor's degree program. The scholars are encouraged to learn various of genres and has even had a short play produced off-Broadway — an achievement that developed from a contact he made at the Kaplan Educational Foundation. Benn describes the program, which supports students for three years, as “removing barriers ... whether they're academic or personal,” enabling the students to develop academic and leadership skills in preparation for transfer to a bachelor's degree program. The scholars are encouraged to learn various of genres and has even had a short play produced off-Broadway — an achievement that developed from a contact he made at the Kaplan Educational Foundation.

Andrew Santiago, an aspiring writer and winner of a scholarship from the Kaplan Educational Foundation, has found direction in his life thanks to support and guidance from his BMCC advisers.
An Impossibly ‘Funny’ Book on Physics
By Gary Schmidgall

FELL INTO the novelty of Michio Kaku’s latest, I found myself asking a question that any good science writer would ask: How could this book possibly be funny?

The answer is: It’s not funny.

It’s impossibly funny. If you read it, you’ll laugh. You’ll be amused. You’ll be surprised. You might even be delighted. But you won’t laugh at the book itself. You’ll laugh at the ideas in the book.

And that’s the point. The book is not a comedy. It’s a science fiction book. It’s a book about the possibilities and impossibilities of the universe.

Kaku’s books are always fascinating, but this one is different. It’s not just about the science. It’s about the possibilities of science.

Kaku divides his impossibilities into three classes: Class I, Class II, and Class III. Each class is further divided into subcategories.

Class I impossibilities are those that are theoretically impossible. They are impossible because they are contrary to the laws of physics. Kaku cites examples such as perpetual motion machines, time travel, and teleportation.

Class II impossibilities are those that are not yet impossible, but are unlikely to be realized. They are impossible because they are extremely unlikely to occur. Kaku cites examples such as wormholes, black holes, and Planck energy.

Class III impossibilities are those that are actually impossible. They are impossible because they are inconsistent with the laws of physics. Kaku cites examples such as perpetual motion machines, time travel, and teleportation.

Kaku’s book is a fascinating exploration of the possibilities and impossibilities of the universe. It’s a book that will make you think about the nature of reality and the limits of science.

But it’s not a book that will make you laugh. It’s a book that will make you think. And that’s what makes it so interesting.
A Fresh Idea Sprouts in the Bronx

By Richard Yeh

The idea to organize a food cooperative came to Zena Nelson one day after a class at Baruch College’s Zicklin School of Business. “I was really hungry — and broke — and coming out of school,” said the 29-year-old master’s degree candidate. “The local supermarket in my neighborhood had not the best food. I couldn’t afford to shop downtown in Manhattan. ‘I’m also a member of the Green Party — all of us in the Bronx — and [previously] we had a conversation about how to do more of a public promotion effort. Somebody mentioned, ‘You should do something like a food co-op.’

Researc...
Congratulations to
DAVID L.V. BAUER
CUNY’S NEWEST RHODES SCHOLAR
• 2008 RHODES SCHOLAR • 2008 HARRY S. TRUMAN SCHOLARSHIP FOR PUBLIC SERVICE • 2007 BARRY M. GOLDWATER SCHOLARSHIP • 2005 INTEL SCIENCE TALENT SEARCH
Macaulay Honors College at City College 2009, Hunter College High School 2005

Visit www.cuny.edu or call 1-800-CUNY-YES and watch CUNY-TV Channel 75.