From the Vice Chancellor

As we start this new academic year we are entering an especially exciting phase in the University’s long-term plan to sustain and advance research activity. A major component of the current Decade of Science initiative is dedicated to building new science facilities, to upgrading laboratories, and to refurbishing existing science buildings across the campuses. This year we are seeing significant new achievements on this front.

The first new science building to be completed during the Decade of Science is opening this fall at Lehman College. New science buildings are also under construction at CCNY and in the planning stages at Hunter and Brooklyn Colleges. Establishing new research space was an integral part of the completed building project at John Jay College. Future building projects include upgrades and improvements to science laboratories at Baruch College, Brooklyn College, NYC College of Technology, and York College. A new biology lab was completed recently at LaGuardia Community College, and a life sciences lab and physical sciences lab are being designed for the New Community College. The capstone of these efforts, the CUNY Advanced Science Research Center (ASRC) is also well underway with an opening planned for fall 2014. Efforts are ramping up to identify and procure necessary core facilities equipment for the Center.

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Lehman College Opens New Science Center

With the official dedication ceremony set for October 12, 2012, Lehman College is the first CUNY institution to complete construction on a science and research building as part of the CUNY Decade of Science initiative. The facility integrates teaching, research, and administrative space and includes laboratories, science learning centers, seminar rooms and a constructed wetland in the central courtyard. It is the first ever CUNY project to be designed and submitted for LEED® (Leadership in Energy and Environmental Design) certification. The project incorporates a number of environmentally sustainable strategies that make it a state-of-the-art addition to CUNY’s science infrastructure.

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A New Way to Manipulate Light

Vinod Menon, Associate Professor of Physics at Queens College, is co-author (with researchers at Queens College, City College, The University of Alberta, Canada, and Purdue University) on the paper “Topological Transitions in Metamaterials”, published in *Science* this April. The paper, which details the discovery of a new method of manipulating light, has broad implications and could result in more efficient solar cells, super bright LEDs, ultra-high sensitive sensors, and single photon sources. One of the co-authors on the paper is Ilona Kretzschmar, Associate Professor of Chemical Engineering at City College. Funding from a CUNY Collaborative Grant started these two CUNY professors on the road to an extremely productive research partnership.

Helping Plants Withstand Global Warming

Eleanore Wurtzel of Lehman College was recently featured in the *New York Daily News* alongside members of her lab. While working with the plant Protein CRuP to aid in the production of Beta Carotene in plants, Dr. Wurtzel’s team accidentally discovered that the protein enables plants to withstand cold temperatures and oxygen deficiency. Dr. Louis Bradbury, a postdoctoral associate in the Wurtzel lab, sees the discovery as an aid in protecting plants from the effects of global warming, particularly flooding, which deprives plants of oxygen. Their study, “Lycopene cyclase paralog CRuP protects against reactive oxygen species in oxygenic photosynthetic organisms,” has been published in the *Proceedings of the National Academy of Sciences*.

Looking for Black Holes

Desmond McKernan and Saavik Ford who are professors at Borough of Manhattan Community College and the Graduate Center, as well as members of the American Museum of Natural History Department of Astrophysics, have published a paper in the *Monthly Notices of the Royal Astronomical Society*. They co-wrote the paper with scientists from the Jet Propulsion Laboratory of the California Institute of Technology and the Harvard-Smithsonian Center for Astrophysics. While researchers know a lot about small and supermassive black holes, intermediate-size black holes are much harder to find. The paper posits that they may have been looking in the wrong place. Using a model that is a scaled-up version of the one that depicts the formation of gas-giant planets (such as Jupiter and Saturn), the paper proposes that intermediate-size black holes form in the gas surrounding supermassive black holes.

Research Advances in Stem Cell Bioengineering

Lane Gilchrist (PI) from the Chemical Engineering Department at CCNY, Steve Nicholl, and Sihong Wang from the Biomedical Engineering program at CCNY in collaboration with Raymond Tu also from the Chemical Engineering program at CCNY, have been awarded a $440,000 grant from the NSF Division of Materials Research for a project entitled Biomimetic Ligand Display in Proteolipobead Hybrid Matrices to Direct Stem Cell Chondrogenesis. Their research has developed a method for integrating microsphere (proteolipobead) assemblies into 3D scaffolds in order to better present the ligands (binding molecules) that are involved in cellular communication, which may lead to a better understanding of stem cell viability and differentiation. If successful, this research could help overcome major technological barriers in stem cell bioengineering.
A Creative Approach to Teaching

Sally G. Hoskins, a developmental biologist at City College, has created a teaching method that uses journal articles instead of textbooks. C.R.E.A.T.E. (Consider, Read, Elucidate the hypotheses, Analyze and interpret the data, and Think of the next Experiment) encourages students to think critically and helps them understand the thought processes behind the science they are studying.

Hoskins was recently featured on the American Association for the Advancement of Science STEM.edu blog, where she said, “The C.R.E.A.T.E. classroom really resembles a lab meeting, with open-ended analysis and discussion of the experiments or field study represented in the paper’s figures replacing passive acceptance of data. Brief lectures (10-15 minutes) by the instructor may be used to fill in particular knowledge gaps but the majority of class time is spent in discussion.” Later in the semester, students generate questions which are sent to paper authors, whose responses also become part of the learning experience (“who does science and why”). Hoskins has been sharing her pedagogy at C.R.E.A.T.E. workshops. Find out more at www.teachcreate.org

NSF Funds Center for Sustainably Integrated Buildings and Sites at CCNY

The City College of New York has been selected by the National Science Foundation (NSF) to participate in the establishment of a Center for Sustainably Integrated Buildings and Sites (SIBS). This Center will be created under the aegis of the NSF Industry/University Cooperative Research (I/UCRC) Program and will develop R&D partnerships with industries, governmental agencies, and nongovernmental organizations that have an interest in creating a more sustainable built environment.

CCNY and Carnegie Mellon University are collaborating with the University of North Carolina at Charlotte, which serves as the lead institution. The SIBS project at CCNY is under the direction of Dr. Robert E. Paaswell, Distinguished Professor of Civil Engineering. The co-directors of the project are Dr. Michael Bobker, Senior Fellow at the CUNY Institute for Urban Systems and Director of the Building Performance Lab, and Dr. Nicholas Madamopoulos, Associate Professor in the Department of Electrical Engineering at CCNY.

Research at the SIBS Center will focus both on industry’s need to respond to regulatory and public demands for minimizing virgin material use, water use, non-renewable energy use, and waste generation, and on society’s need to protect the environment and the natural systems that support human life. The SIBS Center will be multidisciplinary and independent of any one department, school, or college. It will seek to leverage opportunities and funding from technology commercialization offices and business incubators in North Carolina, New York, and Pennsylvania.

CUNY JUNIOR FACULTY RESEARCH AWARDS

In Science And Engineering

Join us in celebrating our junior research faculty in STEM as we embark on our second year of this new awards program.

The reception will be held:

When: Wednesday, October 17th, 4:30-6:30 PM
Where: Kibbee Lounge, CUNY, 535 East 80th St.

Proposal deadline for the 2013 award: November 29

For more information visit: http://cuny.edu/research/faculty-resources/internal-funding-programs/CUNYJFRASE.html
In April, CUNY hosted a three-day workshop, *Institutionalizing Undergraduate Research for State Systems and Consortia*, organized by the Council on Undergraduate Research (CUR) and funded by a grant from the National Science Foundation (NSF). It was attended by small teams of faculty and administrators from each of CUNY’s eleven senior colleges, as well as representatives from the Office of the Vice Chancellor for Research. Designed to improve the quality of STEM education at the undergraduate level, the workshop enabled teams to articulate their goals and construct action plans aimed at institutionalizing undergraduate research at their colleges.

The workshop included four plenaries that covered topics related to increasing participation in undergraduate research. The plenaries were conducted by Mitch Malachowski of the University of San Diego and Jeff Osborn of the College of New Jersey, both of whom formerly served as Presidents of CUR. They discussed the importance of creating a culture of research at undergraduate institutions, the development of an infrastructure to support undergraduate research, as well as the challenges of incorporating mentoring into faculty workload and of integrating research into the curriculum. The workshop also included five breakout sessions, which allowed CUNY teams to work directly with trained CUR facilitators to develop action plans specific to each college, and two concurrent sessions, in which teams members attended small group discussions regarding external funding, curriculum development, and faculty workload.

The weekend provided a valuable opportunity for attendees to network with faculty and administrators from other CUNY colleges. The workshop culminated in presentations by each team describing their newly developed mission statements and short-, medium- and long-term goals for instilling a culture of research on their campuses.

The Office of the Vice Chancellor also developed its own mission statement and set of objectives designed to support the efforts of the individual colleges. These include a website devoted to undergraduate research at CUNY to provide both faculty and students with valuable resources to facilitate research initiatives. The office has also organized a CUNY Undergraduate Research Council consisting of the Directors of Undergraduate Research for each school.

Next fall the teams will come together again for a follow-up workshop during which the representatives will share their experiences, revamp their action plans, and discuss the strategies that have worked as well as the challenges they continue to face.
NSF Internship for CCNY Undergrad

Cherie Fletcher, who is now a junior at the City College of New York, presented at the 2012 Annual Technical Conference (ANTEC), the world’s largest plastics technical conference. Cherie took third prize for her poster, *Surface Energy Effects of PC/SAN/MWCNT’s with the Addition of Reactive Component.*

As a participant in the Bronx Community College Computer Science, Engineering and Mathematics Scholarship Program, Cherie carried out her research under Dr. Vicki Flaris, Associate Professor of Chemistry and Chemical Technology.

As a result of a chance meeting at the ANTEC conference, Cherie applied for and is now a recipient of an NSF Research Experiences for Undergraduates (REU) Summer Internship. She is working in Dr. Bridgette Budhlall’s lab in the Plastics and Engineering Department at the University of Massachusetts Lowell, studying polymer films and polymer colloids for targeted delivery. You can learn more about the NSF REU Program here: http://www.nsf.gov/home/crssprgm/reu/

CUNY Nanotechnology Workshop 2012

When: Monday, November 12, 2012, 9:00am - 5:00pm
Where: CUNY Graduate Center

Register here: http://www.surveymonkey.com/s/CUNYnanotech

Speakers include Paul Weiss, Director, California Nanosystems Institute, and Zeev Rosenzweig, Program Director, Division of Chemistry, NSF

From the Vice Chancellor (continued from page 1)

The CUNY Advanced Science Seminar Series (CASS) resumes in October (see p. 5), and will feature Dr. Michael F. Summers, a structural biologist from the University of Maryland Baltimore County. We will also be holding the CUNY Nanotechnology Workshop in November—the fourth in our series of University-wide workshops that bring together CUNY faculty who work in the ASRC flagship disciplines.

We also continue to build and support entrepreneurship at the University. The new CUNY Master Plan (2012-2016) that was released this summer stresses that in order for CUNY to continue to expand its economic role and to remain responsive to the needs of the city, we must support the entrepreneurial initiatives of our faculty and students. Our office has been actively promoting collaboration with industry and entrepreneurship in recent years. The Technology Commercialization Office (TCO) is currently undergoing a restructuring and hiring new staff; you will find a profile of our newly appointed Acting Director, Doug Adams, of the TCO on p. 9. The TCO has been increasing its efforts to license faculty inventions and intellectual property to industry partners, and to support the formation of start-up companies.

To further encourage the development and commercialization of novel and cutting-edge research being carried out by CUNY faculty, we are establishing a CUNY Hub for Innovation and Entrepreneurship. The University has received $2 million in capital funds from the New York City Council to outfit this facility that will function as a business incubator for CUNY faculty by offering them a physical home base and a variety of supportive and administrative services.

As we move forward with all of these initiatives, we will be sure to keep you updated and engaged.
In 2010, Dr. Heng Ji was awarded a $527,134 NSF Faculty Early Career Development (CAREER) Award to support her innovative interdisciplinary research on Natural Language Processing (NLP) and Information Extraction (IE). Dr. Ji is an Assistant Professor of Computer Science at Queens College and a member of the doctoral faculty of both Computer Science and Linguistics at the CUNY Graduate Center.

As an undergraduate at Tsinghua University in Beijing, Dr. Ji applied to the math, chemistry, and physics departments, but was instead assigned to the linguistics program. “I was not very happy about this,” she says. “It was just not what I had in mind.” However, during her first few months of classes, a linguistics professor recognized her broad ranging potential and recommended her to a computer scientist, who went on to become her first mentor.

At 17-years-old, Dr. Ji was given a set of lab keys so she could carry out research in both the linguistics and computer science departments at her university. Dr. Ji earned her Bachelor's and Master's degrees in Computational Linguistics at Tsinghua before moving to New York City to pursue a doctoral degree in Computer Science at New York University.

Dr. Ji began teaching at Queens College in 2008, a year after receiving her PhD from NYU. However, she didn’t always envision herself as a professor; as an undergraduate she assumed she would find a job in a company and work her way up the corporate ladder. But, halfway through her doctoral study, she decided to switch gears and focus on entering academia, which would allow her to, in a sense, work for herself.

At Queens College, Dr. Ji currently serves as Director of the BLENDER Lab, described as a “cross-lingual, cross-documents, cross-media information extraction and fusion lab,” where she focuses on the development of new technologies that allow computers to understand information from text, video and audio in all languages. NLP researchers are trying to teach computers to process language like humans, thus vastly increasing our ability to mine information from the web.

Dr. Ji’s lab works on several projects aimed at advancing NLP. One area in particular is in information extraction. Often times the computer must first accurately translate the information from one language to another, even when working with a variety of language styles. Current translation programs fall short of the ideal. Dr. Ji explains that when the current programs are applied to text from more casual sources like Twitter or Facebook, the programs fail to properly understand the meaning. Her lab is now focusing on teaching computers a variety of language styles, from the straightforward news article or technical science paper to the informal YouTube comment.

She is also conducting research to enhance computers’ reasoning skills. Humans intuitively understand that when seeking information on a person, information about that person’s spouse is useful. However, computers must be programmed to enable them to draw the logical conclusions we take for granted. Internet search requests would be enhanced by this type of computer reasoning, computers could delve deeper into online information than is possible using simple key word searches.

“I love this research area,” Dr. Ji says. “I think it gives me a really nice balance between the arts and sciences. It not only needs you to know the computing skills. It also requires that you understand the language. If you just know how to do the programming, but do not know

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Research Compliance Update

Training in Responsible Conduct of Research

The Office of the Vice Chancellor for Research has issued a new policy regarding responsible conduct of research training requirements for CUNY faculty, staff and students. The new policy went into effect August 1, 2012.

All CUNY faculty, staff and students involved in research should review the new policy and ensure that they are in compliance. CUNY’s Policy on Training in Responsible Conduct of Research is available on our web site at http://www.cuny.edu/research/compliance/Responsible-Conduct-of-Research.html.

Export Control

The University has issued new guidance, policies and procedures for compliance with export control regulations. These materials address how export control regulations affect research activities, international collaborations, and export-related transactions at CUNY. Individuals who plan to export controlled items or data, including 1) physical shipment of controlled items; 2) electronic or digital transmission of controlled items or data; or 3) release or disclosure of controlled items, technology or technological data to foreign persons (including non-US citizens or non-permanent residents in the United States), should review these materials carefully and contact the Office of the Vice Chancellor for Research for guidance.

Export control guidance, policies and procedures are available on our web site at http://www.cuny.edu/research/compliance/Export-Control.html.

Complying with Export Control Laws When Conducting Research: A Case Study

When: Tuesday October 16, 2012, 1-3pm
Where: John Jay College, 534 West 59th Street, Room L-61

To register visit: http://www.surveymonkey.com/s/YN8DQ65

President Obama Reappoints Professor Vörösmarty of CCNY to the Arctic Research Commission

Charles J. Vörösmarty, Professor of Civil Engineering at City College, has been reappointed to the Arctic Research Commission by President Obama. Professor Vörösmarty was first appointed to the Commission in 2006, and reappointed in 2008. Speaking of the appointment of Prof. Vörösmarty and another member of the commission President Obama said, “I am grateful that these impressive individuals have chosen to dedicate their talents to serving the American people at this important time for our country. I look forward to working with them in the months and years ahead.”

A select group of individuals are appointed to the U.S. Arctic Research Commission by the President. The distinguished members represent academic and research institutions, private industry, and the region’s indigenous residents. The Commission sets national research policies, priorities and goals for Arctic research. Twenty-five percent of the world’s undiscovered gas and oil is located in the Arctic and the commission reviews and recommends research on mineral resources, drilling, global warming, and environmental and ecosystem changes in the region.
Construction the CUNY Advanced Science Research Center (ASRC) is now well under way. The ASRC will house researchers and facilities in five key and emerging research areas: photonics, nanotechnology, structural biology, environmental science, and neuroscience.

In preparation for the August 2014 opening, CUNY has initiated the equipment purchasing process. Madeleine d’Ambrosio, who recently joined the Office of the Vice Chancellor for Research as the Acting Chief Operating Officer and Director of Development for the ASRC will coordinate these efforts.

While construction of the physical plant continues the Office of the Vice Chancellor for Research has been hosting seminars with prominent faculty in each of these emerging research areas. In the Spring of this year, we hosted leaders in the environmental science, structural biology and nanophotonics fields. Dr. Gennady Shvets, Associate Professor of Physics at the University of Texas, Austin, spoke on Optical Metamaterials and Their Applications from Biosensing to Renewable Energy. Also in the nanophotonics field, Dr. Stefan Maier, of Imperial College, London, spoke about Nonopaquerics and Metamaterials. Dr. Maier described new designer materials, based on metallic nanostructures, that allow the marriage of photonics with nanotechnology. These materials hold tremendous potential for communication, sensing, imaging and a myriad other applications.

Dr. Jerry Melillo, Distinguished Scientist and Director Emeritus at The Ecosystems Center of the Marine Biological Laboratory in Woods Hole, Massachusetts, and a Professor of Biology at Brown University, discussed his research exploring the impact of human activities on the biogeochemistry of ecological systems from local to global scales.

As Chair of Structural Biology at the University of Birmingham, UK, Dr. Michael Overduin established the Henry Wellcome Building for Biomolecular Nuclear Magnetic Resonance Spectroscopy, a facility which houses the UK’s most advanced magnets and probes for protein and metabolomics research. In his CASS talk, he addressed questions including how proteins are recruited to reshape subcellular organelles, and how molecular machines and cytoskeletal frameworks are assembled to mediate membrane protein folding, signal transduction, and cell adhesion. The proteins Dr. Overduin studies have been linked to cancer and genetic diseases, and his work offers new opportunities for diagnostic and therapeutic invention.

**CASS this Fall**

When: Thursday, October 18, 3:30-4:30pm  
Where: The Segal Center Theater at the CUNY Graduate Center

Our first speaker in the new CASS session will be Dr. Michael F. Summers. A structural biologist at the University of Maryland Baltimore County, Dr. Summers will speak on ‘Insights into the Mechanism of HIV-1 Genome Packaging and Assembly’.

For more information visit:  
http://cuny.edu/research/news-events/CUNYCASS.html
CUNY was well represented at this year’s World Science Festival with Professors, students and Alumni from John Jay and Queens Colleges participating. As in previous years, Hunter College’s Kaye Playhouse hosted a diverse range of events throughout the 5-day festival.

The John Jay College Department of Sciences of made a return visit to the World Science Festival (WSF) Ultimate Science Street Fair, a free event which capped off the week long World Science Festival. Led by Professor Linda Chiu Rourke, a team of 30 John Jay College faculty, students, alumni and friends demonstrated forensic science concepts to the public.

The World Science Festival estimates that 175,000 people visited last year’s street fair. John Jay College's CSI Experience was such a success that WSF organizers placed Beyond CSI, (covering field science at the crime scene and in the laboratory) at the entrance to the street festival.

This is the fifth year that John Jay College has participated in the World Science Festival's Street Fair and the fourth year in a row that they have occupied one of the largest exhibit areas covering four tented interactive areas. The interactive exhibits drew crowds all day long to find out more about all aspects of crime scene investigation: crime scene analysis, forensic anthropology, DNA extraction, microscopy, and fingerprinting.

Larry Kobilinsky, Chairperson of the John Jay Department of Sciences, overheard a parent and child talking with one of the volunteers. The child was excited enough to exclaim, “I want to go to John Jay College.”

More of the pictures from the event are online here: http://www1.cuny.edu/mu/research/?p=787
Center for Urban Science & Progress Launched in Downtown Brooklyn

On April 23, 2012, Mayor Michael Bloomberg announced the launch of the Center for Urban Science and Progress (CUSP) to be established in downtown Brooklyn. This applied science research institute was proposed by New York University and Polytechnic Institute of NYU (NYU-Poly), and developed in collaboration with corporate partners and world-class universities, including CUNY.

This new Center will confront the array of challenges facing cities including: infrastructure, energy efficiency, green house gas emissions, transportation congestion, public safety, public health, natural resource management, communications, security, housing, and education. The CUSP will present many opportunities for CUNY faculty and students to become involved in collaborative research projects and educational initiatives. New York City will function as a “living laboratory” for CUSP researchers.

In December 2010, Mayor Bloomberg’s administration launched Applied Sciences NYC, and issued a challenge to top institutions from around the world to propose new or expanded applied science and engineering campuses in New York City. In response to this call, CUNY joined with NYU to found the CUSP. The international CUSP consortium also includes Carnegie Mellon University, University of Toronto, University of Warwick, and the Indian Institute of Technology Bombay. The lead corporate partners are IBM and Cisco. The consortium also includes corporate partners such as Siemens and Xerox, engineering and design partners Arup, IDEO, and AECOM, and major infrastructure partners ConEd and National Grid.

Mayor Bloomberg said, “With the addition of this new campus, Brooklyn will be one of the most dynamic environments for entrepreneurs anywhere in the country.”

New Acting Director of CUNY’s Technology Commercialization Office

Doug Adams was recently appointed Acting Director for CUNY’s Technology Commercialization Office (TCO). Adams joined the TCO as a Senior Business Development Officer. In his new role, he will manage and protect commercialization of intellectual property created in CUNY’s labs and research programs.

Mr. Adams graduated from Drexel University with a Master’s of Science in Information Science and subsequently worked in Drexel’s TCO, rising to the position of Director. Throughout his career he has developed considerable expertise in technology commercialization working alongside inventors and researchers in both university and industry settings. He also has extensive experience working alongside industrial representatives and investors responsible for acquiring new technologies.

The TCO, which engages with industry to ensure the commercialization application of CUNY inventions that best benefits the University and its faculty, has recently undergone some restructuring. As part of this process a Licensing Associate will be joining the team in the near future.

Architectural rendering of the proposed Center for Urban Science & Progress Site on the corner of Willoughby Avenue and Jay Street in Brooklyn
Daniel McCloskey, an Assistant Professor of Psychology at the College of Staten Island (CSI) has won the prestigious Faculty Early Career Development (CAREER) award from the National Science Foundation. He will also be receiving 10% in matching funds from the Office of the Vice Chancellor for Research as part of our CAREER Award Incentive.

McCloskey grew up on Long Island and is a product of the State University of New York (SUNY) system. He spent his freshman year at SUNY Stony Brook, but decided to transfer to SUNY Oswego in his sophomore year, where he declared his major almost by chance when he received a memorial scholarship from a family friend, which required that the recipient be a psychology major.

In Paul Stewart’s lab at SUNY Oswego, McCloskey found both the research experience he was looking for and excellent mentorship. He became much more interested in the biological aspects of psychology and in the relatively new study of neuroplasticity—how the brain is capable of changing in response to new experiences and environmental stimuli.

After he graduation, Dr. McCloskey returned to SUNY Stony Brook for his doctoral work and joined Brenda Anderson’s lab. McCloskey’s doctoral thesis explored how exercise can protect the brain, particularly in the case of epilepsy. He sought to understand how the property of brain plasticity could be channeled to achieve positive outcomes. His dissertation found that when rats with epilepsy exercise prior to seizure their brains are protected.

McCloskey stresses the importance of good mentoring. He believes that both Paul Stewart and Brenda Anderson saw potential in him that he was not even aware of himself at the time. McCloskey brings a similar optimism and enthusiasm to his teaching and mentoring at CSI. It is very rewarding for him to take students, who may not be performing at the highest level when they enter his lab, and see something instilled in them that sets them on fire and then they finish their degrees with amazing success.” McCloskey was attracted to CUNY by this commitment to mentoring and student success.

McCloskey joined the faculty of the Department of Psychology at CSI in September 2007 and has forged a solid foundation there. He shares resources and collaborates with his colleagues, and has mentored numerous doctoral candidates, Master’s students, and undergraduates in his lab.

One of his first priorities as a new faculty member was to invest in state-of-the-art equipment, which was made possible using his start-up package and Decade of Science funding. McCloskey believes that investment in equipment is important because it attracts both students and collaborators. McCloskey’s lab operates the only patch clamp recording equipment on Staten Island. Faculty and students from CUNY and from neighboring institutions use the equipment. McCloskey is building research networks; he collaborates and publishes with these outside researchers. Grant reviewers are impressed with the facilities at CSI and state as much in their reviews.

McCloskey is one of only a handful of neuroscientists who work with mole rats. In April 2007, when he was in the process of applying to CSI, he says, “I came across a fact about naked mole rats that changed my life forever.” He read in a fact-a-day calendar that his sister-in-law had given him that in addition to being neither moles nor rats, naked mole rats are coldblooded. That they cannot control their body temperature is very intriguing for neuroscientists. Seizures and temperature are highly related, and for McCloskey, who was studying epilepsy and seizures, the opportunity to learn how the brain responds to temperature in an animal population was invaluable. McCloskey has found a very high incidence of epilepsy in mole rats, which suggests another route for further investigation.

Naked mole rats are very long lived, don’t feel certain
Daniel McClosky (continued)

types of pain, don’t get cancer, and thrive under very low oxygen conditions in crowded, cramped tunnels. They are also the only animals, other than insects, to have evolved to live in cooperative groups with a queen and one breeding male. McCloskey states that the social organization of mole rats provides a perfect test case for furthering the study of social neuroscience. “Looking at what part of the brain is coordinating social interaction is still so untapped—as a psychologist and someone who is interested in the brain that is like the holy grail.” Dr. McCloskey’s CAREER project will investigate how the brain orchestrates social behavior among members of a group. His team will use social network analysis to identify mole rats with particularly high or low levels of social behavior and will then measure whether brain expression of the hormone, oxytocin, corresponds to these individual differences.

McCloskey developed a novel approach to tracking the movement and behavior of his colony of mole rats. Each mole rat has a chip embedded under its skin, and ring readers that use toll collection technology are positioned all over the cage.

Because of the high volume of data produced (over 3 million events [i.e. animal movements] a week) Dr. McCloskey worked with Dr. Michael Kress, the Vice President for Technology Systems at CSI to develop a state matrix to help manage and interpret the data. This state matrix records the location of each animal and continuously updates the record. This form of collection and analysis is extremely data intensive and would not be possible without the computational resources made available by the High Performance Computing Center.

Because McCloskey was the first researcher to track the rats round-the-clock, he was the first to show that the rats have a 24-hour day/night or activity/rest schedule. McCloskey is interested in memory and the ways that individual rats in these large family groups recognize each other. He is also interested in trying to figure out if individual rats form bonds, and his research is starting to show that the movement and interaction of colony members is not random. However, many questions remain. What makes one animal more social than another? What are their methods of social learning? Why do certain rats tend to pair off or congregate with other rats?

McCloskey plans to design better methods for observing the whole animal so he can conduct more longitudinal studies. McCloskey says that the CAREER award matching funds from the Office of the Vice Chancellor for Research will enable him to develop these studies and gain deeper insights into brain activity and social interaction.

Did You Know?

The Office of the Vice Chancellor for Research recently became an Institutional Member of the New York Biotechnology Association (NYBA), a not-for-profit dedicated to the development and growth of New York State-based biotechnology-related industries and institutions, and to strengthening the competitiveness of New York as a premier global location for biotechnology/biomedical research, education, and industry.

Career Awardee Heng Ji

(continued from page 6)

how to capture the language, you can’t do the work.”

In addition to the CAREER award, Dr. Ji’s current funding includes a U.S. Military Defense Advanced Research Project Agency Award, a U.S. Army Award and a NSF EAGER award. The work is providing valuable experiences for her lab team and she has high praise for them. “I’m very lucky,” she says. “They work very hard.”

Dr. Ji has been awarded all but one grant for which she has applied. “It’s like a snowball. Once you get some funding then you get students working, then you’re more productive and you publish more papers,” she says. “The snowball is becoming larger and larger.”

To take advantage of CUNY’s Institutional Membership, visit www.nyba.org and click Industry Directory on the left navigational panel. Click the Members Area Login Registration option, select City University of New York (CUNY) from the drop-down menu and then complete your personal contact information.
While many college undergraduates see summer as an opportunity to take a well-deserved break from their studies, the participants of the 2012 CUNY Summer Undergraduate Research Program had something else in mind. These 18 talented juniors and seniors spent 10 weeks of their summer vacations working closely with CUNY faculty mentors and immersing themselves in exciting, hands-on scientific research. The program, which just completed its third year, was made up primarily of CUNY undergraduates, but also included students from Adelphi University, Fordham University, Bard College, and SUNY Genesco. Participants and mentors came from a wide range of scientific disciplines, including neurobiology, chemical engineering and photonics. Each C-SURP participant received a $3,500 stipend for his or her commitment to the program and half of the students took advantage of free university housing in Midtown East. To supplement the time spent in the labs, the students attended weekly seminars and activities. Seminar topics ranged from biodiversity patterns in Brazil’s coastal rainforests to NASA research, and were designed to expose the students to the wide range of research careers available to them, both within and outside of academia. The young scientists toured the biology and paleontology labs of the American Museum of Art History and the art restoration labs of the Metropolitan Museum of Art. They also participated in an Improvisation for Scientists workshop, run by Stony Brook University’s Center for Communicating Science, which engaged them in improvisational theater games and exercises designed to teach them how to speak more effectively and directly about their research.

The program culminated in a poster session at the Macaulay Honors College, at which point the students put their new communication skills to use and presented the results of their research to University administrators, faculty and peers. The success of the CUNY Summer Undergraduate Research Program is due in large part to funding from the Alfred P. Sloan Foundation, and the Office of the Vice Chancellor for Research looks forward to continuing and enhancing the program in the future. More information about C-SURP and the application process for the 2013 program can be found at cuny.edu/research/sr/csurp.html
Amana Hosten is an Environmental Earth System Science major entering her junior year at City College. During the 10-week C-SURP she worked in Professor Charles Vörösmarty’s lab. Dr. Vörösmarty works with the NOAA-Cooperative Remote Sensing Science and Technology Center and is Director of the CUNY Environmental Crossroads Initiative at City College.

Amana built on a previous study conducted by graduate student, Lilybeth Colón, who is researching hydrologic extremes in the Caribbean region. Amana’s project sought to evaluate various socio-economic factors that can contribute to an island’s vulnerability to extreme rainfall events. She compiled several socio-economic and biophysical indicators across eight islands in the Caribbean, and then plotted this data against Colón’s values of monthly average risk. Amana’s project found that population density may be a significant factor influencing the vulnerability of islands in the Caribbean.

John Ruano-Salguero worked with Lane Gilchrist in the Department of Chemical Engineering at CCNY. John transferred to CCNY from La Guardia Community College in Fall 2011 and will be a second semester junior this year. Before joining the Chemical Engineering department at City College he worked in the electrophysiology facility at LaGCC with Dr. Ivan Rivera-Torres. Because of his outstanding performance in chemistry, Dr. Rivera-Torres asked John to become his research assistant and he quickly learned the techniques involved in electrophysiology. John attests that his decision to pursue chemical engineering was a direct result of the research he did with Dr. Rivera-Torres. John said that he spent the first couple weeks of the C-SURP program shadowing a graduate student in order to learn how to use the confocal microscope equipment. After this training period, Dr. Gilchrist came into the lab one day and asked John if he wanted to develop his own project, and John said he already knew exactly what he wanted to do.

John’s research in Dr. Gilchrist’s lab focused on developing a novel method to replicate the asymmetry of lipids found in cell membranes using biochemical methods. Cell membranes are comprised of different types of lipids and these are often assembled in an asymmetric fashion in a lipid bilayer. John developed scaffolds using silica microspheres (lipobeads) as a platform for constructing this asymmetric bilayer. John plans to continue working with Dr. Gilchrist during the upcoming academic year and expand his research with lipobeads. John found the C-SURP experience to be very rewarding and plans to pursue a doctorate in chemical engineering.
Growing up in Malaysia, May Poh Lai did not engage in science education as a child. It was not until she moved to the U.S. at the age of 14 and took a high school biology course that she developed a fascination for the sciences. A rising senior at Lehman College and a student of the Macaulay Honors College, May Poh is working towards earning a B.A. in Biology and a B.S. in Biochemistry.

As a C-SURP participant, May Poh joined the Loayza Lab at Hunter College, where principal investigator Diego Loayza examines the functions of telomeres in human cells. Telomeres, located at the end of chromosomes, are essential for maintaining genome stability, regulating cell replication and preventing chromosomes from fusing together or degrading. May Poh’s project examined the role of certain proteins in the telomeres and how this role differs between normal human cells and tumor cells.

Although she was previously involved in biological research projects at Lehman, C-SURP provided May Poh with her first experience in molecular biology research. She enjoyed learning new experimental methods and gaining an understanding of the reasoning behind them. As a result of her exciting summer research experience, May Poh is now interested in pursuing a graduate degree in molecular biology within the CUNY system. She is specifically interested in cancer research, and will be working in two cancer labs at Lehman during the fall semester.

Igor Naydichev, now just a year away from obtaining his B.S. in Psychology from Brooklyn College, did not always know that he was destined for a career in scientific research. In fact, Igor worked for five years in the Information Technology industry before deciding to change career paths. His interest in the human mind was first sparked as a result of his experiences with family members suffering from neurological and psychological problems, and in 2011 he decided to return to school to pursue this interest.

Igor spent his summer working in the Memory and Metacognition Lab at Brooklyn College under Dr. Elizabeth Chua, where learned how to administer Transcranial Direct Current Stimulation (tDCS) to test subjects. tDCS is a method of stimulating the brain with a constant, low electrical current delivered via small electrodes. In Igor’s research, this stimulation was administered to the parietal cortex to determine how the presence of the current affects a test subject’s word recognition. Test subjects who saw words while stimulated by the current later had greater rates of false recognition, or were more likely to “remember” a word that they had not actually seen. These results indicate that the parietal cortex plays a role in false recognition. Igor found that the most rewarding part of his C-SURP experience was working directly with his mentor and the other members of the research team. He enjoyed taking on a wide range of responsibilities within the lab, and appreciated having the opportunity to meet many interesting people through his research. After he graduates next May, Igor intends to pursue a Ph.D. in clinical neuropsychology.
### 2012 Collaborative Incentive Research Grant (CIRG) Winners

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<th>Faculty</th>
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<td>Lia Krusin, (CCNY)</td>
<td>Building Nanoscale Epitaxial Heterostructures of Topological Superconductors</td>
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<td>Maria Tamargo, (CCNY)</td>
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<td>Aidong Shen, (CCNY)</td>
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<td>Jessica Rothman, (Hunter)</td>
<td>Deciphering the Nutritional Goals of Baboons across Africa: Unraveling the Roles of Phylogeny and Ecology</td>
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<td>Larissa Swedell (Queens)</td>
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<td>Hamidreza Norouzi (NYCCT)</td>
<td>A Multi-Sensor / Multi-Frequency Remote Sensing Observations Data Fusion fo Monitoring Deforestation in the Amazon</td>
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<td>Kyle McDonald, (CCNY)</td>
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<td>Diana Romero, (Hunter)</td>
<td>Deciphering the 'Contradition' Between Availability of Reproductive Health Services and Unintended Adolescent Pregnancy: Role of Life Experiences and Goals</td>
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<td>Carol E. Roye, (Hunter)</td>
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<td>Kristin Sommer (Baruch)</td>
<td>Social Rejection as a Precursor to Unethical Decision-Making</td>
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<td>Mary Kern (Baruch)</td>
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<td>Hernan A. Makse (CCNY)</td>
<td>Time-Resolved Complex Network Analysis of EEG Signals During Sleep and Video Watching</td>
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<td>Lucas Parra (CCNY)</td>
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<td>Anjana Saxena (Brooklyn)</td>
<td>Role of Nucleolin in Regulating mRNA Stability During DNA Damage Response</td>
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<td>Frida Kleiman (Hunter)</td>
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<td>Cheryl Harding (Hunter)</td>
<td>Mechanisms of Mold-Induced Brain Inflammation and Cognitive Deficits</td>
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<td>Carolyn Pytte (Queens)</td>
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<td>Noel Goddard (Hunter)</td>
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<td>Elaine Gale (Hunter)</td>
<td>Quantifying Best Practice Patterns of Deaf and Hard of Hearing Educators Relative to Audiological Perspectives via Videotape Analysis</td>
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<td>Donald Vogel (Hunter)</td>
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<td>Nelly Fazio (CCNY)</td>
<td>Group-Theoretic Learning with Errors Problems</td>
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<td>Vladimir Shpilrain (CCNY)</td>
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<td>William E. Skeith (CCNY)</td>
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<tr>
<td>David Allen (CSI)</td>
<td>An Interdisciplinary Study of Collaboration and Creativity: What Artists Offer Secondary and Post-Secondary Instruction</td>
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<td>Jason Wirtz (Hunter)</td>
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### 2012 Community College Collaborative Incentive Research Grant (C3IRG) Winners

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<td>Katherine M. Conway (BMCC)</td>
<td>An Investigation of Prior Experience and Course Type as Factors Affecting Online Stem Student Retention and Success</td>
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<td>Claire W. Wladis (BMCC)</td>
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<td>Alyse C. Hachey (BMCC)</td>
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<td>Sharon S. Ellerton (Queensborough CC)</td>
<td>A Cross CUNY Collaboration to Assess the Impact of Service-Learning on Community College Students</td>
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<td>Sandy Figueroa (Hostos CC)</td>
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<td>Caitlin Cahill (Kingsborough CC)</td>
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<td>Debra Abston (BMCC)</td>
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<tr>
<td>Urszula Patrycya Golebiawska (Queensborough CC)</td>
<td>A Multi-Sensor / Multi-Frequency Remote Sensing Observations Data Fusion fo Monitoring Deforestation in the Amazon</td>
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<tr>
<td>Chiaki Yanagisawa (BMCC)</td>
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<td>Zhe Wang (Bronx CC)</td>
<td>Quasiconformal Motions and Some Generalized Teichmüller Spaces</td>
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<td>Sudeb Mitra (Queens)</td>
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