As we approach the end of another calendar year we should take the opportunity to celebrate our collective achievements of 2013 and look towards future opportunities in the New Year. 2014 promises to be an exciting year for research at the University with the upcoming opening of the CUNY Advanced Science Research Center (ASRC). Much work is currently underway in preparation for the opening, including completing the outfitting of the building, purchasing instruments for the various core facilities and hiring both faculty and staff who will reside at the center. We are delighted to have recently recruited Dr. Kevin Gardner to the position of ASRC Director for Structural Biology. He also has a faculty position in the chemistry department at City College. Kevin joins CUNY from the University of Texas Southwestern Medical Center, where he was the Virginia Lazenby O’Hara Chair in Biochemistry. He has a Ph.D. in molecular biophysics and biochemistry and is internationally known as an expert in the use of NMR spectroscopy to study how cells sense and adapt to their environment. I encourage you to find out more about Kevin and his vision for structural biology at the ASRC on our website: [http://www.asrc.cuny.edu](http://www.asrc.cuny.edu)

The ASRC houses a state-of-the-art cleanroom for nanofabrication and, as the final stages are being completed, we have hired Dr. Jacob Trevino to the position of Scientific Cleanroom Director. Jacob joins us from Boston University and will be spending much of his time in the upcoming year travelling to CUNY campuses to meet with research faculty and students to discuss the many new research opportunities available as a result of having this facility at CUNY. He will be happy to help potential users think through the best strategy for enhancing their research by making use of the facility. More information about the ASRC cleanroom and Dr. Trevino’s background can be found on page 13 of this Newsletter.

The ASRC will house many additional core facilities with instrumentation including functional magnetic resonance imaging (fMRI), nuclear magnetic resonance spectroscopy (NMR), electron microscopes, and electrophysiology rigs to name a few. Further information about the ASRC and how faculty and students will be able to participate will be distributed in the months leading up to the opening – I hope to see you there next September!

Best wishes for the holidays and the New Year,

Gillian Small, Vice Chancellor for Research
Faculty Spotlight: Dr. Elizabeth Sklar

Come up with a byeline on Elizabeth Sklar’s research at Brooklyn College.

Dr. Elizabeth Sklar, professor of Computer and Information Science and director of the Multimedia Computing Program at Brooklyn College, brings a small group of aspiring undergraduate researchers into her Agents Lab each year to participate in the MetroBotics program. MetroBotics is a Research Experience for Undergraduates (REU) project funded by the National Science Foundation. This program is unique because it is the only year-round REU in the field of Computer and Information Science and Engineering (CISE).

The REU, currently in its fourth year, is composed of five students from three CUNY senior colleges. These undergraduate MetroBotics fellows delve deeply into an independent research project under the mentorship of Dr. Sklar and her co-director, Dr. Simon Parsons. Their research focuses on agent-based and multiagent systems research. Drs. Sklar and Parsons examine how teams of robots interact with one another and with human operators and work on the development of search and rescue robots. Most search and rescue teams currently utilize a single high-end robot. The goal of Dr. Sklar’s research is to design a fleet of inexpensive robots that can perform just as well. Multiple robots could be significantly more cost-effective in emergency situations when robots are damaged.

The research involves algorithmic development to improve communication between robots and between the robot team and its human operators. Robot teams must be capable of reconfiguring in the event that one robot drops out. In order to manage data flow in emergency situations individual robots must also be able to preprocess data and identify significant information before relaying it to human operators.

Other Research Experience for Undergraduates at CUNY
Research Experiences for Undergraduates in Satellite and Ground-Based Remote Sensing to NOAA-CREST
PIs: Dr. Reginald Blake & Dr. Pamela Brown, New York City College of Technology

An Invitation to Basic and Applied Science of Psychology: Research Experiences for Undergraduates at Baruch College
Pl: Dr. Jaihyun Park, Baruch College

Intensive Mentored Research Experience for Undergraduates in Clinical, Cognitive, and Behavioral Neuroscience at an Urban Public College
Pl: Dr. Laura A. Rabin, Brooklyn College

REU Site: Research Opportunities in Biology.
PIs: Christine Li & Jonathan Levitt, CCNY

Earth and Planetary Science and Astrophysics REU at the American Museum of Natural History in Collaboration With the City University of New York
PIs: Charles Liu, College of Staten Island

To learn more about the NSF REU program, visit: www.nsf.gov/home/crssprgm/reu
How do we ensure that all undergraduate students at CUNY get a taste of research excellence? Because participation in research by undergraduates has been demonstrated to be a high-impact educational practice, creative ways are needed to integrate this experience into the curriculum in order to broaden participation. This summer, two National Science Foundation grants were awarded to CUNY faculty and administrators to do just that. These grants, from the Division of Undergraduate Education, aim to integrate research experiences into science courses across the University at both 4-year and community colleges.

Both of the awarded grants were part of the Transforming Undergraduate Education in Science program, and were 2 of only 30 Type 2 grants given nationally in the last round. Professor Sally Hoskins (CCNY) was awarded a grant to expand the C.R.E.A.T.E. (Consider, Read, Elucidate hypotheses, Analyze and interpret data, Think of the next Experiment), which she developed. Professor Theodore Muth (Brooklyn College) and University Associate Dean Avrom Caplan (CUNY Central) were awarded a grant to introduce authentic genomics research into the undergraduate curriculum across the University. The genomics project aims to map microbial populations across New York City using students to both gather and analyze the data.

More information on the grants can be found by visiting www.cuny.edu/research.html. Faculty should Drs. Hoskins, Muth or Caplan for more information about how to use these novel teaching tools in their courses.

Transforming Undergraduate Education

The undergraduate MetroBotics fellows are introduced to the Agents Lab through informal seminars given by Sklar, Parsons and PhD students. They are then given the opportunity to choose a research question. Students work in the lab for twelve hours a week during the academic year and present their findings at the Brooklyn College Science Day, held annually in May.

Dr. Sklar benefitted from a mentored research experience as an undergraduate at Barnard College, and began working as a mentor while employed at Massachusetts Institute of Technology’s Lincoln Laboratories. However, it was during her time as a junior faculty member at Columbia University that she gained extensive experience working closely with undergraduate students in a lab setting; this experience taught her how to be an enthusiastic and effective mentor in the lab. Since the inception of the MetroBotics program in 2009, Dr. Sklar has mentored 32 students from seven CUNY campuses.

Dr. Sklar recently received a Fulbright Scholar Award and is on leave for the 2013-2014 academic year. She will spend four months at Kings College, London, and work as a research fellow at the University of Liverpool. Three of Sklar’s colleagues from the environmental science and computer science departments at Brooklyn College will manage the MetroBotics program in her absence.

By providing undergraduate students with an intensive, hands-on mentored research experience, the MetroBotics program gives its participants the opportunity to apply what is learned in the classroom to meaningful research experiences and to develop skills that will aid them in their academic and professional careers. Elizabeth Sklar’s REU program contributes to CUNY’s goal of institutionalizing undergraduate research.

The CUNY Summer Undergraduate Research Program (CSURP), is now accepting applications. The deadline for application is February 14, 2014. Visit http://www.cuny.edu/research/sr/csurp.html to learn more and apply. #CSURP or follow us on Facebook

Visit http://www.cuny.edu/research/sr/csurp.html to learn more and apply.
Technology Commercialization

TCO Licenses vein illumination patent

CUNY’s Technology Commercialization Office Licenses vein illumination patent

Correctly inserting a needle in a vein appears straightforward. However, it can be time consuming (taking up to three tries to correctly insert a needle into a child’s vein), and causes patients and their doctors distress, or worse. It is of vital importance in radiology and oncology, where there is always the fear of Infiltration and Extravasation. Leakage of the radiology dye or chemotherapy medicine from the vein into the soft tissue surrounding the needle is a serious complication. It is particularly difficult to locate veins in the obese, the very young and aged, and in patients with very dark skin.

The CUNY Technology Commercialization Office recently licensed a US patent that addresses this difficulty. US patent 5, 929,443, “Imaging of objects based upon the polarization or depolarization of light” has been licensed to Near Infrared Imaging, a medical device company based in Boston. Dr. Robert Alfano, of City College, and his Ph.D. student, Stavros Demos, invented the vein illumination technique in 1996. This invention allows doctors to image objects located in, at the surface of, or behind turbid media.

Near Infrared’s vein illumination product will be called AVV-1. It illuminates a patient’s veins so that a needle stick is safe and painless. The images are so clear and detailed that a missed needle stick is very unlikely.

The cost of the AVV-1 will be 50% less than the competitors, offering a greater chance for worldwide adoption and acceptance. The CUNY technology allows for the use of polarization and de-polarization of the optics, avoiding the use of less effective and more expensive projection technology. The AVV-1 allows for total hands-free operation and illuminates the entire path of veins, providing a runway for IV placement. This technology uses LEDs, not lasers, as lasers can be dangerous if the light makes direct contact with the human eye. The camera is able to illuminate veins through hair and dark skin and in patients where the competitors have failed.

The device was recently showcased to phlebotomists, nurses and physicians at Massachusetts General Hospital, Waltham, MA - the #1 rated hospital in the USA. The hospital medical practitioners were impressed with the images and encouraged rapid implantation into the market.

The TCO recently added a new member, Neeti Mitra to the team. Neeti has several core responsibilities including identifying, evaluating and prioritizing invention disclosures, consulting with patent attorneys, drafting non-confidential marketing abstracts, serving as an initial point of contact for potential licensees, managing non-disclosure agreements and inter-institutional agreements, and monitoring our current licensees for compliance purposes. Please contact Neeti if you have any questions about how to proceed with disclosing a new invention or about the status of your patent application.

We look forward to continuing our work with CUNY inventors and to assisting them with the commercialization of their technologies and to meeting new inventors, so please contact us if you have any questions about a possible discovery generated by your lab.
In the world of university entrepreneurship, it can be tough to transition from “good idea” to successfully forming a company or licensing a technology. This is especially true in the hard sciences such as physics, engineering, chemistry, biology, and geology—areas in which the researchers who understand the technology have no real concept of who or what their “target market” is. The National Science Foundation (NSF) has not only identified this “ditch of death,” but it has also implemented a national effort move previously funded basic research into the marketplace to pressure-test the viability of these projects. The NSF created the Innovation Corps (I-Corps) in 2011 in an effort to assess the commercial readiness of federally funded technology concepts, and to create useful new products, processes, and services.

There are three levels of I-Corps: Nodes, Sites, and Teams. The New York City Regional Innovation Node (NYCRIN) is one of only 5 national nodes. The NYCRIN is a collaboration between CUNY, NYU, and Columbia that connects, engages, and educates 25 leading universities within the New York, New Jersey, Pennsylvania, and Connecticut region. The NYCRIN has three strategic aims: to teach the NSF national I-Corps course to university teams from across the nation, to create a regional infrastructure leveraging the NYC entrepreneurial ecosystem, and to collect, analyze, and utilize the data gathered from I-Corps teams. NYCRIN hosted its first I-Corps team cohort only a month after the Node was established, and it received high remarks from the NSF after this Level 1 initiative was completed. The first Level 2 activity was a Networking Event that took place on July 24, 2013.

The NYC Regional Innovation Node’s inaugural Networking Event hosted over 130 representatives from 18 of the 25 universities from each of the four states. This event was designed to connect the counterparts from the regional universities, to develop new collaborations and increase innovation in the Node region. The founding I-Corps Program Director, Errol Arkilic, gave an in-depth talk on “The Genesis and Vision of I-Corps” in which he described how and why the program started, and how the NSF envisions that the I-Corps will impact the US economy in a drastic way.

The event closed with a panel discussion with successful I-Corps teams, which was found to be very useful by many of the attendees. One network school participant stated that the panel “was insightful regarding what the teams went through and what they learned. It provided good insights about how they moved from early fundamental research to understanding where market opportunities were for their technologies.” An overwhelming majority of post-event survey respondents stated the information provided at the event made them more likely to organize or facilitate organization of I-Corps teams.

Overall the NYC Regional Innovation Node’s first regional event was a great success for not only the leadership team, but more importantly, for those who attended from our network universities. NYCRIN will continue to expand its regional events and is excited to work cooperatively to build, utilize, and sustain a national and regional innovation ecosystem that further enhances the development of technologies, products, and processes that benefit society.
Natural Resources Imagery Grant Program

Dr. Sunil Bhaskaran, a Professor in Geospatial Applications for Earth and Environmental Sciences, based in the Department of Chemistry and Chemical Technology at Bronx Community College (BCC), has received the Natural Resources Imagery Grant Program award. This award is funded by industry leaders, the Environmental Systems Research Institute (ESRI) and PCI Dynamics, and seeks to fund research that demonstrates the value of GIS and image processing for natural resource management. The grant—valued at $100,000—takes the form of geospatial software, a time series of current multi-sensor optical radar satellite data for New York City, and a virtual training package. Dr. Bhaskaran’s team will investigate new data fusion techniques and develop an innovative land cover use model for New York City. The anticipated outcome of their research will be to develop a classification model that will be useful for numerous applications including urban planning, land cover mapping, and natural resource management. Their new data fusion technique may be used in fusing multispectral optical and microwave radar data.

Radarsat 2: the BCC group will use land-use data gathered by this satellite

Virginia Valian, Distinguished Professor of Psychology at Hunter College and Gillian Small, Vice Chancellor for Research were awarded $124,923 from the Alfred P. Sloan Foundation for a one-year pilot project entitled the CUNY Faculty Awards Expansion Project. The project aims to increase the number of awards, named fellowships, keynote and plenary talks, and other signs of professional recognition for CUNY faculty in the sciences. The project aims to make the successful nomination of colleagues for awards and prizes a normative feature of CUNY science departments. The project is currently underway; all the Chairs from the participating departments have been contacted and the process of identifying nominees for awards has begun.

The Rockefeller Foundation

The City University of New York was awarded $444,997 by the Rockefeller Foundation on November 19, 2013 in support of the Science and Resilience Institute at Jamaica Bay (SRIJB). The project led by SRIJB interim director, Dr. William Solecki (Hunter) includes conducting a needs assessment and building organizational capacity in order to apply resilience methodologies in the revitalization of the Jamaica Bay recreational area.

The City University of New York is leading a consortium of academic and non-profit organizations (Columbia University, Cornell University/New York Sea Grant, NASA Goddard Institute for Space Studies, Rutgers University, Stevens Institute, Stony Brook University, and the Wildlife Conservation Society) that have been tasked with establishing a Science and Resilience Institute at Jamaica Bay. In August 2013, The City of New York and the National Park Service selected CUNY to lead this exciting new initiative that will be both an important contributor of scientific knowledge and a major creator of opportunities for resilience practice in the socio-ecological systems in and around Jamaica Bay.
**Holford wins Camile-Dreyfus Teacher-Scholar Award**

Mandë Holford, Assistant Professor of Chemical Biology at Hunter College, has won a prestigious Camile Dreyfus Teacher-Scholar Award for 2013.

The Awards are granted by the Camile and Henry Dreyfus foundation “supports the research and teaching careers of talented young faculty in the chemical sciences” and provides an unrestricted research grant of $75,000. Recipients of the award have established an independent body of scholarship within the first five years of their appointment as independent researchers, and demonstrated a commitment to education, signaling the promise of continuing outstanding contributions to both research and teaching.

The board acknowledged that competition for the 2013 awards was strong.

**Research Compliance**

**Plagiarism in Research: Common Pitfalls & Unforeseen Consequences**

Date: Thursday, February 6, 2014
Time: 9:00AM – 1:00PM

Venue: The Graduate Center Proshansky Auditorium 365 Fifth Avenue
New York NY 10016

To apply, please visit [www.cuny.edu/research.html](http://www.cuny.edu/research.html).

**Compliance Welcomes Sonya Hadrigan**

Sonya Hadrigan is the new University Assistant Director for Research Compliance. Ms. Hadrigan will be working with the Director of Research Compliance on policy development and implementation, as well as education and quality improvement, concerning all areas of research compliance.

She has extensive experience in research compliance having held the position of Research Ethics Compliance Officer with the Army Human Research Protections Office within the Department of Defense. Prior to that, she was the Senior IRB Regulatory Analyst at the University of Miami.

Ms. Hadrigan has a BS in Biology from The State University of New York, Stony Brook, a BSN in Nursing from the University of Miami, and a MSN as a Family Nurse Practitioner from the University of Miami. She is also a Certified Institutional Review Board Professional.
When Stacy Chan began studying chemistry and physics at Mission College and San Jose State University in California, she did not have a very clear vision of how she wanted to her career to progress. Her subsequent move to New York City and decision to attend Kingsborough Community College helped her define her objectives; she describes herself as a born-again science major. Her own life experiences motivated her to seek an understanding of the mechanics behind psychological disorders.

The C-SURP placed Stacy in the lab of Dr. Jeffrey Halperin, a Distinguished Professor of Psychology at Queens College, where she worked on a project designed to assess whether parenting style and attention deficit hyperactivity disorder (ADHD) symptoms in preschool children can act as predictors of callous-unemotional traits and antisocial behavior among children when they reach school age. Stacy's primary research tasks involved data analysis of tests taken by the children, and of recorded interactions between children and their parents. These methods were designed to measure the impact of parental attitudes and behaviors on childhood development and learning.

Stacy will be transferring to Brooklyn College for the fall 2013 semester, however she will continue to work with her KCC mentor, Homar Barcena, on his green organic chemistry research. Though Stacy's major is chemistry, Dr. Halperin was impressed by Stacy's ability to assimilate unfamiliar psychology concepts and materials, and then apply them. Stacy found that her experience in Dr. Halperin's lab helped her to understand the bigger picture when it comes to scientific research, and she also benefited from working in a different type of lab environment.

Joseph Szydlo is a rising senior psychology major at Queens College. In the summer of 2012 Joseph worked in the Rutgers University Biomedical Engineering laboratory. That experience provided him with his first entry into the world of laboratory-based experimentation, and whetted his appetite for another hands-on intensive research experience at CUNY. Joseph worked in Dr. Joshua Brumberg’s Laboratory of Cortical Circuitry at Queens College this summer.

Joseph’s study aimed to investigate how sensory deprivation achieved by trimming the whiskers of mice, would affect the shape, size and overall cell density of microglia within the sensory cortex of mouse brains. Microglia are the resident macrophages—cells that ingest foreign particles, bacteria, or cell debris—of the central nervous system and serve as the primary immune defense in the brain.

Interestingly, Joseph worked in the lab with Racheli Wercberger, a 2012 C-SURP participant, who also continued to work with Dr. Brumberg, and used this research experience to write her senior thesis. Racheli is now pursuing her doctorate in neuroscience at the University of California San Francisco. Dr. Brumberg plans to co-author a paper with his two C-SURP students based on the findings from this project.
Baruch Tabanpour is a rising senior in the Electrical Engineering program in the Macaulay Honors College at the City College of New York. Prior to joining the C-SURP program he had already participated in two research experiences. He conducted paleoclimatology research in 2010 during an internship with the NASA Goddard Institute of Space Studies. In the summer of 2012 he had an internship with the National Institute of Standards and Technology (NIST) and researched spintronics devices and films.

The C-SURP placed Baruch in the lab of Dr. Vinod M. Menon in the physics department at Queens College, where he worked on a project entitled, Strong Coupling Between Surface Plasmon Polaritons on Ag and Excitons in Rhodamine. For this research, Baruch used an optical setup to study the relationship between light and electron waves on the surfaces of metals for applications in light harvesting devices.

Baruch Tabanpour in front of his project’s poster, Strong Coupling Between Surface Plasmon Polaritons on Ag and Excitons in Rhodamine.

Baruch will graduate this fall from City College with a major in Electrical Engineering and a minor in Physics. He is currently applying to applied physics graduate programs to study photovoltaics and computational physics research. After graduate school he hopes to work in research and development in a technical field such as renewables, spintronics, or photonics.

Anastasiia Sergiienko knew from a young age that she wanted to study physics, but at the technical university she attended in the Ukraine, Kharkiv Polytechnic Institute, this option was not available to her. Instead, she studied power engineering with a specialization in alternative energies. Since the fall of 2012, she has been pursuing a second Bachelor’s degree in physics at Hunter College.

While at Hunter, Anastasiia has actively sought opportunities to conduct hands-on research and found out about the C-SURP program in one of her classes. During her research experience, Anastasiia worked in Dr. Steve Greenbaum’s lab at Hunter College on a project that is a collaboration with the Department of Mechanical Engineering at University of Pennsylvania. She studied the effect of thermal annealing on the structure of diamond-like carbon (DLC). Diamond-like carbon is a material that has numerous potential applications as a durable and low-friction coating. Some of these applications require that the DLC function at very high temperatures, and indeed, these materials were tested on one of the last Space Shuttle flights. Therefore, it is extremely important to study whether the heating process results in structural changes at the atomic level. Anastasiia used electron paramagnetic resonance methods to detect structural defects in the DLC as a function of annealing temperature.

Steve Greenbaum was so pleased with Anastasiia’s work during the C-SURP program that he invited her to spend her senior year as a member of his research group. Anastasiia plans to graduate in May 2014 and to continue her research on alternative sources of energy in graduate school and in her career.
The City University of New York has begun, with the assistance of the Alfred P. Sloan Foundation, an initiative to provide more opportunities for students interested in Science, Technology, Engineering and Math (STEM) to land well paying jobs in industry, government and non-profit organizations. CUNY’s Professional Science Master’s (PSM) degree is a two-year graduate degree that combines elements of Master’s level study in a science or engineering field with “plus” courses in a variety of applied areas, such as project management, technical writing, organizational behavior, regulatory affairs, and entrepreneurship, to name a few. Students in the program will also benefit from internship opportunities that will make them more competitive in their career search. Our industry and government partners include IBM, U.S. Environmental Protection Agency, Northrop Grumman, Quest Diagnostics, U.S. Navy, and Lockheed Martin, among others.

CUNY currently has two nationally-recognized PSM programs, an MS in Geographic Information Science at Lehman College and an MS in Photonics at Queens College. Other programs are in development, including an MS in Earth Systems and Environmental Science & Technology at CCNY, an MS in Biotechnology at Hunter College, and an MS in Biomedical Laboratory Management.

According to Vice Chancellor Gillian Small, “Through collaborating with area employers, PSM degree programs at CUNY can play a very important role in preparing skilled professionals to excel in those economic sectors that are vital to our city, and our region.”

For more information on the Professional Science Masters program at CUNY or if you are interested in creating one, please contact Eric Vieira, Director of Special Research Programs (eric.vieira@cuny.edu; 646.664.8903).
Back in July, CUNY students gathered at UNICEF’s New York headquarters to pitch their ideas to a panel of experts at the culminating event in the inaugural CUNY Designs for UNICEF Challenge. This program was conceived of and developed by Vice Chancellor for Research Gillian Small and the UNICEF Innovation Unit co-lead Christopher Fabian. The program was designed to tap into the vast talent of CUNY’s diverse student population to propose and scale innovations with the potential to reduce the approximately 7 million preventable child deaths that occur every year across the globe. As Vice Chancellor Small has asserted, “many of our students come from these countries; who better to understand the problems and to come up with inventive, low tech solutions for them?” In essence, it is a crowd-sourcing experiment with a social-innovation bent: how could compelling student ideas grow into viable, scalable solutions when paired with the institutional expertise and resources of UNICEF?

Students at CUNY self-organized into teams, and were asked to tackle the five main killers of children worldwide – pneumonia, malaria, diarrhea, pre-term birth complications, and complications during birth. During the four-month design process, these teams were connected to UNICEF’s global network of experts and resources for guidance and support.

Forty-five (45) teams representing 15 CUNY schools participated in the 6-month application process with 7 teams making it to the final round of the competition. The winning teams demonstrated a creative problem solving approach and design process that has the potential to evolve and positively impact UNICEF programming in the field. They will receive support from CUNY to travel to a UNICEF Country Office to prototype their solution with end-users.

The 3 winning teams are:

A Bridge to Pure Water, from College of Staten Island, developed a photo-catalytic film that increases the efficiency of water purification. The film can be inserted into a plastic bottle, where it reacts with sunlight to inactivate bacteria. Team Members: BiBi Ghafari, Hosea Mak, Yaminah Kezadri, Yang Liu, Yuan Yuan Zha. To watch their video, click here.

Creative Solutions, from Macaulay Honors College and Baruch College, proposed to strategically introduce oral iron supplements in the form of a hard candy through community-based organizations and partnerships with local universities. Team members: Rajshekhar Basak, Kristy Timms, Patryk Perkowski, Shehab Chowdhury, Slava Brodetskiy. To watch their video, click here.

In Her Hands, from Macaulay Honors College, proposed a platform for maternal health education that integrates social and economic opportunity through a mentor-mother model. Team members: Agnieszka Gugala, Bianca Malhotra, Kate McQuater, Swathi Mummini, Jasmine Varughese. To watch their video, click here.

An honorable mention went to QC Engineering Brigade of Queens College for their invention of PedalPure, an open-source, modular water-purification system that uses bicycle power. Team members: Arunprakash Kumarakrishnan, Aditya Kumarakrishnan, Thomas Esch, Ze’ev Landau.

To learn more about winning teams and this year’s upcoming competition, please visit www.fulfillingthepromise.org.
In 2012, the National Science Foundation recognized Shamik Sangupta’s research with a prestigious Faculty Early Career Development (CAREER) award, given “in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education and the integration of education and research within the context of the mission of their organizations.” Dr. Sengupta also received a 10% matching grant from the Office of the Vice Chancellor for Research as part of our CAREER Award Incentive for his project, *Survivability and Self-coexistence in the Battle of Cognitive Radio Network Societies*.

Dr. Sengupta joined the faculty of John Jay College in 2009 as an Assistant Professor in the Department of Mathematics and Computer Science, where he established the Security in Wireless & Ad hoc Networks (SWAN) Lab. Dr. Sengupta graduated with honors from Jadavpur University in India and received his Ph.D. degree from the University of Central Florida.

Public safety first-responders—firefighters, police officers, and emergency medical operatives—all communicate using licensed radio bands. Because these bands are static and hardware enabled, groups of public safety responders are not able to communicate with each other across their assigned bands. Communication failures lead to critical inefficiencies and confusion in emergency situations. To address this, government agencies decided that a new paradigm was needed that allowed radios to function in a flexible manner across frequencies.

To achieve this goal, the concept of dynamic spectrum access was developed, allowing unlicensed radio networks to access licensed bands when they are not in use and open up the spectrum to allow radios to operate in different frequencies as needed.

The main obstacle to implementing this new paradigm is that the hardware currently used by all public safety and military radios is programmed to transmit and receive on only one frequency, and all emergency communication devices are hardware enabled and use statically assigned bands. In order to communicate securely, emergency responders need designated licensed bands that safeguard unblocked frequencies for emergency communications. Sengupta is working on the first generation of smart radios, developing software that will enable radios to learn from their environment. These next generation radios can be programmed to detect all the frequency bands within their range and are no longer subject to hardware limitations or statically assigned bands. All next generation radios will be software driven and will have cognition capability.

There are, of course, drawbacks and vulnerabilities to this process. Sengupta acknowledges that the opportunity for attack and disruption is greatly increased: “Given these new cognition capabilities how can emergency responders operate and survive in a world with greater chances of being attacked? We have to be able to predict the ways in which the radios will be attacked, and we need to have contingency plans for how to respond.”

Sengupta’s CAREER project tries to solve these issues. With researchers at the Stevens Institute of Technology (where he completed postdoctoral research) and funding from the National Institutes of Justice, Sengupta has developed a cognitive radio prototype, which has been able to sense harmful interference and secure two-way communications in a new band.

Once Sengupta and his collaborators are done with the prototyping he will deploy the cognitive radios with the NYC fire department. His major aim is to get the technology into the hands of public safety workers.

Dr. Sengupta is applying inter-disciplinary research methodologies based on game theory and stochastic learning to investigate the survivability of these radio networks. Several graduate students work in his lab as well as undergraduates and a high school summer intern. Perhaps most excitingly, in terms of future development in this new field, the educational model he developed for his CAREER project introduces wireless security into the curriculum. Dr. Sengupta is forging a whole new area of study.
ASRC Update: The ASRC Cleanroom Facility

The ASRC cleanroom is a state-of-the-art facility for interdisciplinary research in nanoscience and applied nanotechnology. The cleanroom offers a comprehensive set of tools to help researchers develop new micro- and nanoscale devices, such as integrated circuits, advanced sensors, microelectromechanical systems (MEMS), and microfluidic systems. The cleanroom is also equipped to support nanotechnology research that spans several science and engineering fields, allowing advances in areas as diverse as nanophotonics, condensed matter physics, and biomedical device engineering.

The cleanroom will be a 4,271 sq. ft. cleanroom with additional lab space for back-end processing and support. The ASRC is set to open in fall 2014 and the cleanroom will offer one of the most advanced of its kind in the greater New York City area. The cleanroom and its equipment will be open to all qualified users, welcoming researchers from industry and other academic institutions.

Dr. Jacob Trevino, the new Scientific cleanroom Director, joined the ASRC team in September 2013. Prior to his arrival at CUNY, Dr. Trevino worked as a Senior Process Engineer in the Micro-Electro-Mechanical Systems (MEMS) industry. In his most recent position at Analog Devices Inc., he utilized cutting edge micro- and nano-fabrication techniques to bring new inertial MEMS products into high-volume manufacturing. He has also worked in the area of MEMS foundry process development, collaborating with several universities and companies to bring their designs to realization.

Dr. Trevino’s academic research focuses on nanophotonics. His doctoral research involved the design of complex nanostructures for enhanced light-matter interactions in planar optical devices. Specifically, his work targeted the enhancement of light emitting diodes (LEDs), thin-film solar cells, bio-sensors, and optical beams carrying orbital angular momentum (OAM).

Dr. Trevino earned a B.S. in Physics and B.A. in Mathematics from Susquehanna University, a M.S. in Electrical Engineering from Case Western Reserve University and a Ph.D. in Materials Science and Engineering from Boston University.
Dr. Simon Kelly joined the neural engineering group in the department of Biomedical Engineering at CCNY in 2010. He was awarded his B.E. in electronic engineering and Ph.D. in biomedical engineering from University College Dublin. He then held two highly productive postdoctoral positions at the Nathan Kline Institute and Columbia University working in human and non-human primate neurophysiology. His diverse research background spans a multitude of domains relevant to basic and translational neuroscience.

Since coming to CUNY, Dr. Kelly has designed a new Neural Systems laboratory, which has become a focal point for neural engineering at CCNY, and he has assembled a strong research team that includes a postdoc, two Ph.D. students, two Master’s students, and eight undergraduates. Simon has an impressive 44 peer-reviewed publications in the fields of neural engineering and basic and clinical neuroscience. He has also been successful in obtaining external research funding; last year he was awarded a Support of Competitive Research (SCORE) grant from the National Institutes of Health.

Professor Stacey Brenner-Moyer is an Assistant Professor of Chemistry at Brooklyn College. Since joining the faculty in 2006, she has maintained a high level of research productivity, has been very effective at obtaining funding to support her research, and has demonstrated exemplary service to her students, her department, her University, her profession, and the community.

Dr. Brenner-Moyer has begun to establish an internationally recognized research program in the field of organocatalysis. Her research involves the development of new organic reactions using environmentally friendly catalysts and the use of these reactions in the synthesis of bioactive compounds. Dr. Brenner-Moyer’s research appears in the top peer-reviewed journals in her field. Two of her latest manuscripts were highlighted in Synfacts, a journal that features the most significant recent developments in synthetic chemistry.

In addition to her research contributions, Dr. Brenner-Moyer has been very successful in garnering external funding. Early in her career, she wrote a successful grant to the National Institutes of Health to support her work through the Support of Competitive Research (SCORE) funding mechanism. Most recently, she received a prestigious Early Career Development (CAREER) award from the National Science Foundation.

Dr. Brenner-Moyer has also excelled as a mentor and teacher. She restructured the organic chemistry curriculum in her department and has been instrumental in growing the Chemistry Ph.D. program at Brooklyn College. At present, she has a core research group of three Doctoral students and one Master’s student in her lab. She has also mentored a large cadre of undergraduate students, several of whom have gone on to graduate programs at top-tier research universities. Dr. Brenner-Moyer has taken a particular interest in mentoring women in science. She founded the Women in Science and Engineering (WISE) club for undergraduate students at Brooklyn College.

Dr. Kelly’s research program centers on the fundamental mechanisms of decision-making and attention in humans and incorporates many translational projects. The primary objective of his current research is to determine the neural mechanisms that underlie behavior, and his lab pursues this goal by extracting brain signals noninvasively from humans—mainly electroencephalographic (EEG) scalp signals. He is now working on several collaborative projects that investigate epilepsy, Parkinson’s disease and childhood anxiety disorders. Recently Simon published an important paper on the neural correlates of decision formation in humans in the top-tier journal Nature Neuroscience. This paper marks a groundbreaking advance in the study of basic sensory-motor transformations in humans and has significant clinical implications.
Alexey Ovchinnikov, Queens College

Alexey Ovchinnikov is widely recognized as a leader in the field of differential and difference algebra. He has served on the faculty of the Queens College Mathematics department since 2009, and joined the doctoral faculty at the Graduate Center last year. Since earning his undergraduate degree from Moscow State University in 2004, he has received two doctoral degrees, one from North Carolina State University and one from Moscow State University. He has 30 publications, and has received two NSF awards including the prestigious CAREER award for his project on computational differential algebra.

Dr. Ovchinnikov's work has helped to revitalize the field of differential algebra, but he also has extraordinary mathematical breadth. He works in diverse fields of mathematics such as algebraic geometry, representation theory, and model theory. His research has numerous existing and potential applications across a wide variety of fields such as cellular biology, chemistry, mathematical physics, and mechanics and dynamical systems. Dr. Ovchinnikov's great strength has been his ability to both attract researchers from diverse fields as collaborators on differential algebra projects, as well as explore the impact that differential algebra can have on other areas of mathematics.

Dr. Ovchinnikov’s is an active member of the larger CUNY mathematics community and has engaged in research collaborations with several other CUNY faculty members. Dr. Ovchinnikov is the main organizer of the Kolchin Seminar on Differential Algebra and has been instrumental in bringing top-tier mathematicians from all over the world to speak at the Graduate Center for the series. Dr. Ovchinnikov is also committed to training young mathematicians; he has mentored undergraduates, graduate students and high school students and has supported students both at Queens College and the Graduate Center with his NSF grants.

Brian Tiburzi, City College of New York and The Graduate Center

Dr. Brian Tiburzi has been an Assistant Professor in the Physics department at City College and the Graduate Center since 2011. He completed his Ph.D. at the University of Washington and held a position as a Research Scientist at the Laboratory for Nuclear Science at MIT prior to coming to CUNY.

Dr. Tiburzi works in the area of modern nuclear theory, which is based on the Standard Model of fundamental particle interactions. His appointment at City College was as part of the RIKEN Fellowship Program. The RIKEN Center for Nuclear Physics at the Brookhaven National Laboratory has a program of selecting, cooperatively with a university, outstanding researchers who will have joint appointments for the first five years.

In his first year at CUNY, Dr. Tiburzi was awarded a National Science Foundation grant to study the nature of the strong nuclear interaction at the shortest distance scales entitled, Electromagnetic Properties and Hadronic Parity Violation in Lattice quantum chromodynamics (QCD). His comprehensive research program is poised to make fundamental contributions to modern nuclear physics by combining advances in theoretical physics and high-performance computing.

In addition, Dr. Tiburzi has been awarded, on a competitive basis, several hundred hours of CPU time from the USQCD supercomputer facilities. The USQCD is a collaboration of U.S. scientists developing and using large-scale computers for calculations in lattice quantum chromodynamics. He has also been selected to serve as a Kavli Institute for Theoretical Physics Scholar, which is based at the University of California at Santa Barbara and is the NSF's national center for fundamental physics.

Brian is a prolific, highly productive physicist; he has over fifty publications in refereed journals, and has given over fifty research talks. He has made significant contributions in several areas of particle and nuclear physics and is well versed in an even broader set of topics. He is also a dedicated teacher, and is actively guiding students in both the physics department and in the Science Division at City College.
Community College Collaborative Incentive Research Grant Winners, Round 10

<table>
<thead>
<tr>
<th>Faculty Awarded</th>
<th>Title of Proposal</th>
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<tbody>
<tr>
<td>Benjamin D. Powell, (BMCC)</td>
<td>Assessing the Impact of Digital Storytelling in the Public Speaking Classroom</td>
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<tr>
<td>Brianne Waychoff, (BMCC)</td>
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<tr>
<td>Elizabeth Whitney, (BMCC)</td>
<td></td>
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<tr>
<td>Anupam Bhatnagar, (BMCC)</td>
<td>Cohomology and Moduli in Algebraic Dynamics</td>
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<tr>
<td>Mahdi Majidi-Zolbanin, (LGCC)</td>
<td></td>
</tr>
<tr>
<td>Tomonori Nagano, (LGCC)</td>
<td>The knowledge of collocations among learners of English as a second language (ESL) and its relation to progress in remedial English writing</td>
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<tr>
<td>Martin Chodorow, (Hunter)</td>
<td></td>
</tr>
<tr>
<td>Nicholas DiZinno, (QCC)</td>
<td>Active and Passive Deformation in the Motion of a Compliant Fiber</td>
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<tr>
<td>Jeffrey L. Schwartz, (QCC)</td>
<td></td>
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<tr>
<td>Azita Mayeli, (QCC)</td>
<td></td>
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<tr>
<td>Daniel Garbin, (QCC)</td>
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<tr>
<td>Shalva Tsiklauri, (BMCC)</td>
<td>A study of deeply bound K−pp and K−NNN kaonic nuclei using hyperspherical harmonics</td>
</tr>
<tr>
<td>Roman Kezerashvili, (NYCCT)</td>
<td></td>
</tr>
<tr>
<td>Julia Rothenberg, (QCC)</td>
<td>The View From Above: Inclusion, Exclusion and Aesthetic Experience in the Luxury City</td>
</tr>
<tr>
<td>Steve Lang, (LGCC)</td>
<td></td>
</tr>
<tr>
<td>James Feustel, (KCC)</td>
<td>Discipline-specific Quantitative Reasoning Contextualization in Learning Communities</td>
</tr>
<tr>
<td>Homar Barcena, (KCC)</td>
<td></td>
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</tbody>
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The Community College Collaborative Incentive Research Grants (C³IRG) Program, Round 11, is now accepting applications. The deadline for application is April 4, 2014. Visit [www.cuny.edu/research.html](http://www.cuny.edu/research.html) to learn more and apply.

The CUNY Junior Faculty Research Award in Science and Engineering (JFRASE) Program aims to cultivate the excellence and ensure the promise of research-intensive, early career, science and engineering faculty at CUNY. The nomination deadline for this year’s JFRASE competition is Monday, January 6, 2014 at 5pm. Please visit [www.cuny.edu/research.html](http://www.cuny.edu/research.html).
# 2013 Collaborative Incentive Research Grant (CIRG) Winners, Round 20

<table>
<thead>
<tr>
<th>Faculty Awarded</th>
<th>Title of Proposal</th>
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<tbody>
<tr>
<td>Steve Greenbaum (Hunter) Paul Sideris (Queens)</td>
<td>Investigation of Charge Transfer Mechanisms in Li/CFx-Ag2V4O11 Hybrid Cathode Materials Using Multinuclear Solid State NMR Spectroscopy</td>
</tr>
<tr>
<td>May May Leung (Hunter) David Forbes (Brooklyn)</td>
<td>Exploring the Impact of a Mindfulness-based Pilot Study to Reduce Childhood Obesity Risk in Underserved Urban School-age Youth</td>
</tr>
<tr>
<td>Elizabeth Jeglic (John Jay) Cynthia Calkins Mercado (John Jay) Partha Deb (Hunter)</td>
<td>The Economics of Sex Crime Policy and the Reduction of Sexual Recidivism</td>
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<tr>
<td>Claudia Brumbaugh (Queens) Cheryl Carmichael (Brooklyn)</td>
<td>Letting Go and Moving Forward: The Benefits of Establishing New Romantic Connections</td>
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<tr>
<td>Douglas Mennin (Hunter) Jin Fan (Queens)</td>
<td>Neurobehavioral basis of emotional and conflict-based decision-making in relation to the treatment of anxious depression</td>
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<tr>
<td>Yuping Jiang (Queens) Linda Keen (Lehman)</td>
<td>Combinatorial Characterizations of Holomorphic Maps</td>
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<tr>
<td>Joel David Hamkins (Staten Island)</td>
<td>Weak embedding phenomena in omega_1-like models of set theory</td>
</tr>
<tr>
<td>David Gruber (Baruch) Mandé Holford (Hunter)</td>
<td>Discovery of novel probes for investigating neuronal disorders</td>
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<tr>
<td>Harris Zeigler (Hunter) Paul Feinstein (Hunter)</td>
<td>Molecular Genetic Analysis of Active Sensing</td>
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<tr>
<td>Theodore Joyce (Baruch) David Jaeger (Graduate Center)</td>
<td>A Randomized Field Experiment of a Hybrid versus Traditional Economics Lecture</td>
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<tr>
<td>Kai Shum (Brooklyn) Yuhang Ren (Hunter)</td>
<td>Development of CsSnI3 thin film solar cells</td>
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<tr>
<td>Jean Grassman (Brooklyn) Glen Johnson (Lehman) Jack Caravansos (Hunter)</td>
<td>Geospatial, environmental, and social factors associated with urinary mercury excretion in an Artisanal Small Scale Gold Mining Site in Colombia, South America.</td>
</tr>
<tr>
<td>Luis Cardoso (NYCCT) Graffar Gailani (NYCCT) Stephen Cowin (City)</td>
<td>Nano Scale Permeability Measurement in Bone Tissue</td>
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<tr>
<td>Rohit Parikih (Brooklyn) Stephen Neale (Graduate Center)</td>
<td>Game Theory, Language and Communication</td>
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</table>

The Collaborative Incentive Research Grants (CIRG) Program, Round 21, is now accepting applications. The deadline for application is March 7, 2014. Visit [www.cuny.edu/research.html](http://www.cuny.edu/research.html) to learn more and apply.
On November 11, Vice Chancellor Gillian Small was honored by the Feminist Press at its annual Gala. She was one of four 2013 honorees who participated in a panel discussion moderated by Michelle Anderson, Dean of CUNY Law School. Musician Joan Jett presented the Inspiration, Empowerment and Leadership awards to writer and activist Michaela Angela Davis, Le Tigre frontwoman Kathleen Hanna, AT&T Chief Diversity Officer Debbie Storey, and Vice Chancellor Small. Each of the awardees spoke about the importance of feminism in their fields of endeavor. Vice Chancellor Small said, “there is a need for mentorship and support for women in science, which is why my office believes in supporting women in science symposiums and workshops.”