In this, my last Research Newsletter at CUNY, I reflect on what a privilege it has been to oversee the research enterprise at the University over the past decade. I believe we have made great strides towards creating a more supportive environment for both faculty and student research across our colleges. Through internal seed programs, such as the interdisciplinary research grants (formally the collaborative grants), the community college research grants, and the CUNY-ASRC seed grants, we have supported faculty in the early stages of research projects, many of which went on to compete successfully for external funding. Our office also launched an undergraduate research initiative that created a number of opportunities for students, including the Alfred P. Sloan Foundation-supported CUNY Summer Undergraduate Research Program, and the CUNY Research Scholars Program for Associate degree students, which is funded by the NYC Mayor’s office.

We have also provided both practical and financial support to help jump-start the careers of our junior faculty with grant-writing workshops, matching support for early investigator awards, and through a Sloan-funded Junior Faculty Research Award for a few promising new researchers in STEM fields. We also established a postdoctoral development program that provides support in the form of travel funds, career guidance, and networking opportunities.

Over the last few years we have created an entrepreneurship and innovation network to not only protect our researchers’ intellectual property but also to help them translate their innovations to the marketplace. In addition, we are increasingly helping faculty create start-up companies and secure initial funding through federal small business innovation grants. In 2014 we opened the CUNY Hub for Innovation and Entrepreneurship to provide an incubator space and a collaborative and supportive environment for these university spin-offs.

Many of our research facilities were renovated and some new ones were built including the CUNY Advanced Science Research Center, which was created to provide state-of-the-art labs and core facilities to support the work of researchers across CUNY. We have also hired wonderful new faculty for the ASRC and at all the colleges—who not only perform first-class research, but also train the next generation of investigators by engaging our undergraduate and graduate students.

But most of all, I reflect on the fact that I have encountered some of the most resourceful, passionate, smart, and diverse people I could ever hope to meet among our administrators, faculty and students. So while I will remain in contact with many of you, I would like to take this opportunity to thank the entire CUNY family for your collegiality and friendship during my tenure at the University. I wish you all great successes in the years to come.

Gillian Small, Vice Chancellor or Research
CSI Neuroscientist Wins Nation’s Highest Honor for Early Career Researchers

Daniel McCloskey, an Associate Professor of Psychology at the College of Staten Island (CSI), was named a recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE) by President Barack Obama on February 16, 2016—thus granting him the U.S. government’s highest award given to scientists in the early stages of their independent research careers.

Twenty-one of the PECASE awardees were nominated by the National Science Foundation (NSF). All of the NSF nominees, including Dr. McCloskey, are recipients of the Faculty Early Career Development (CAREER) award. NSF rigorously vetted its nominees and selected Dr. McCloskey for his “research combining modeling, neurophysiology and systems biology/network science that will transform the field of social neuroscience by providing a comprehensive approach towards understanding the role of neuropeptides in complex behavioral systems.”

Dr. McCloskey’s research is focused on understanding the brain systems involved in everyday social behavior. This is accomplished by studying colonies of African naked mole-rats—a unique and highly social fossorial rodent. McCloskey believes the social organization of mole-rats provides a perfect test case for furthering the study of social neuroscience. 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 using toll collection technology collect data round-the-clock. 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 based at CSI. Study of this highly organized social community of mammals will help researchers understand how individual differences in social behavior are influenced by physiological and environmental factors.

Gary Reichard, Provost and Senior Vice President for Academic Affairs at CSI called Dan McCloskey “a faculty super-star. He not only conducts highly significant, cutting-edge research with real-world implications, but also serves as a mentor and role model for undergraduates and graduate students alike.”

Dr. McCloskey spent two days in Washington, D.C. in early May to meet with Administration leaders and President Obama. The PECASE ceremonies took place at the NSF and the White House.

CUNY Faculty Fulbright Scholars

Dr. Yoel Rodríguez, an Associate Professor in the Physical Sciences at Hoston Community College was awarded a Fulbright Award for 2016-17 that will allow him to expand his research in the Slovak Republic.

Seven CUNY faculty members including Rodríguez have won the prestigious Fulbright Award in 2016, including Teresa J. Bandosz (Chemistry, CCNY), who was profiled in the Winter 2016 Research Office Newsletter, Marco Castaldi, (Chemical Engineering, CCNY), Aloke Ghosh (Accountancy, Baruch), Donna Gittler, (Law, Baruch), Victoria Sanford (Anthropology, Lehman), and Gail Levin (Art History, Baruch).

Significantly, Professor Rodríguez is one of the few community college professors to have been selected for this honor. During his sabbatical leave, he will conduct research related to the treatment of cardiovascular and heart disease in the Slovak Republic at the Institute of Experimental Pharmacology and Toxicology in the Department of Biochemical Pharmacology.
Faculty Profile: Javad Shabani

Javad Shabani, a new Assistant Professor of physics at CCNY, has received Young Investigator Research awards from both the Air Force Office of Scientific Research and the Army Research Office for a combined grant of $800,000 over three years. Dr. Shabani's impressive research accomplishments span the study of novel states in fractional quantum Hall physics in two-dimensional electron systems, to the manipulation of quantum states in a quantum bits (qubits). These two new awards will allow him to pursue his current research investigating epitaxial superconductor-semiconductor materials systems as a platform for quantum computation.

Dr. Shabani has a multidisciplinary background in the sciences; in 2004 he received Bachelor’s degrees in both electrical engineering and physics from the Sharif University of Technology located in Tehran, Iran. Dr. Shabani joined the Quantum Electronics Group at the University of California Santa Cruz in 2004, and earned his M.S. in Electrical Engineering.

In 2005, when his wife Maryam Abazari—also a graduate of Sharif University and now a Materials Scientist at GE Global Research—decided to pursue her doctorate at Rutgers University, Dr. Shabani moved to Princeton University and joined the Low-Dimensional Systems Lab where he worked with Mansour Shayegan. It was in Shayegan’s lab that Dr. Shabani began to work with molecular beam epitaxy (MBE) equipment, which is ultra-high vacuum instrumentation that makes possible the thin film deposition of single crystals. With MBE, Dr. Shabani is able to trap electrons in a sheet of 10 nanometer thick material, which he says provides a “playground for just pure electrons.”

After earning his MA and PhD in Electrical Engineering from Princeton, Dr. Shabani decided that he wanted to pursue more applied research in his field. In 2011 he relocated to Harvard to join the lab of Charles Marcus as a Post-Doctoral Fellow. Marcus is known for his research in quantum electronics and information systems. It is at this point that Dr. Shabani became engaged in topological quantum computation research.

Unfortunately, not long after Dr. Shabani arrived at Harvard, Marcus left to head the Center for Quantum Devices at the Niels Bohr Institute in Copenhagen. As a result, in 2012, Dr. Shabani moved to the California NanoSystems Institute at the University of California Santa Barbara to work as a Post-Doctoral Fellow and later as a Project Scientist. During his time at UC Santa Barbara he continued to collaborate with Charles Marcus and he began his association with Station Q, the Microsoft Research lab also located on the campus of UC Santa Barbara. Just this past April Dr. Shabani co-authored an article published in Physical Review B entitled “Two-dimensional epitaxial superconductor-semiconductor heterostructures: A platform for topological superconducting networks,” with many of these colleagues.

According to Dr. Shabani, “When working with a single electron spin as a qubit, many very minor things ("noise") can affect the state of the spin, making it difficult to control them in a coherent manner. Quantum physics in novel materials can help us protect our qubits better. One could in fact encode information in (quasi)particles with richer intrinsic properties that makes them immune to noise of the environment due to topology of their setup and operation. the physics is very rich in the study of these topological quantum states. The problem that Dr. Shabani and his collaborators faced was that they didn’t have a particle that had the ability to perform this type of operation, so they decided to engineer such particle. Dr. Shabani asserts that the development of these new elemental particles or fermions opens up a whole new horizon in solid state physics.

Dr. Shabani plans to continue working on engineering this particle at CCNY. He established his lab in July 2015 in the newly opened CCNY Center for Discovery and Innovation (CDI), and is working closely with the Nanofabrication Facility located in the Advanced Science Research Center. His CDI lab contains a cryo-free dilution refrigerator with 14T magnet, and a high-mobility MBE system donated to him by Princeton University. He is on schedule to have a fully functioning and self-sufficient growth, fabrication, and measurement laboratory capable of fabricating semiconductor heterostructures and is looking forward to working with CUNY undergraduates, graduate students, and colleagues as he continues this exciting research.
Mapping the NYC Bed Bug Genome

Mercer Brügler, an Assistant Professor of Organismal Biology at the New York City College of Technology (City Tech) was a co-author on a paper published in Nature Communications that has received a great deal of popular attention—probably due to its unsettling subject matter. The study in which the authors map the genome of the New York City bed bug has been picked up by more than 60 print and online news outlets. Prior to joining the faculty of City Tech in 2014, Dr. Brugler was a Gerstner Scholar and Postdoctoral Fellow at the American Museum of Natural History (AMNH) Sackler Institute for Comparative Genomics. He has maintained an affiliation with the museum, and it was as part of a team of AMNH researchers that he worked on the project entitled “Genome assembly and geospatial phylogenomics of the bed bug Cimex lectularius.”

In the study the authors sequenced the common bedbug genome and profiled gene expression across all of its life stages in order to show changes in gene expression after feeding on human blood. To learn how the bedbug has evolved and spread, the team took DNA samples from 1,400 city locations including subway cars and parks. Dr. Brügler extracted DNA from the standard laboratory Har-73 insecticide-susceptible strain of Cimex lectularius (the common bedbug), and extracted RNA from across all seven developmental stages of the bed bug life cycle. In collaboration with Dr. Mark Siddall (Curator of the Annelida & Mollusca Collections and Professor in the Graduate School at the AMNH), Dr. Brügler investigated and reported on the anticoagulation repertoire (and related proteins) of the bed bug.

Dr. Brügler received a Bachelor’s degree in Marine Biology from the University of Miami, a Master’s in Marine Biology from the College of Charleston’s Grice Marine Laboratory, and a Ph.D. in Environmental & Evolutionary Biology from the University of Louisiana at Lafayette. Since being appointed to the faculty at City Tech he has been a very active mentor and colleague. He mentors several City Tech students in his labs at both City Tech and AMNH. He is also collaborating on a research project with two of his colleagues, Drs. Tatiana Voza and Ralph Alcendor. They are sequencing the DNA of several new species of deep-sea corals that were recently collected near New Zealand.

David Jeruzalmi, Professor of Chemistry and Biochemistry at City College has been awarded a National Science Foundation (NSF) award to establish a Research Experience for Undergraduates (REU) site at CCNY. This innovative new program is called Research and Training in Biochemistry, Biophysics and Biodesign for Undergraduates (B3-REU) and engages faculty from the chemistry, biology, physics, biomedical engineering, and chemical engineering departments at CCNY. The B3-REU will recruit and train both CCNY undergraduates and CUNY community college students. As the biological sciences increasingly adopts more quantitative approaches, Dr. Jeruzalmi believes that initiatives such as this summer REU are essential to maintaining a pipeline of undergraduates who are cross-trained in chemistry, biology, physics, mathematics, and engineering. This REU contributes to the growth in interdisciplinary science at CUNY as evidenced by the new Master’s Program in Translational Medicine and the activities of the Advanced Science Research Center.
Study of Hormones in Fruit Flies Builds Research Capacity at Baruch

Rebecca Spokony, an Assistant Professor of Natural Sciences at Baruch College was awarded a Research in Undergraduate Institutions (RUI) grant from the National Science Foundation (NSF). The RUI program seeks to strengthen the research capacity at primarily undergraduate institutions, and also to support the integration of research and undergraduate education.

Dr. Spokony's lab at Baruch focuses on the ways hormones regulate development. Her interest in this area was ignited while working on her doctorate at the University of Arizona, where she researched central nervous system reorganization during the metamorphosis of the common fruit fly (Drosophila melanogaster). While a postdoctoral researcher at the University of Chicago she further examined the genome-wide targets of the two main hormones involved in metamorphosis—ecdysone and juvenile hormone. In her NSF research project, Genetic Architecture of Juvenile Hormone Sensitivity, she is studying the genetic basis for how particular hormones cause fruit flies to grow new body parts (polyphenism) in response to extreme environmental conditions such as a lack of food or increased population density.

A central aspect of this research project is the implementation of a course-based undergraduate research experience (CURE) for third year students at Baruch. Dr. Spokony aims to expand undergraduate participation in research, and introduce students—who may otherwise not have had the opportunity or resources—to the benefits and rewards of engaging in authentic research.

Did you know… The RUI program can help you obtain NSF funding

The National Science Foundation (NSF) Research in Undergraduate Institutions (RUI) program is designed to assist investigators from primarily undergraduate institutions (PUI).

A college qualifies as a primarily undergraduate institution if it has graduated fewer than twenty PhD students in the past 2 years. With the exception of CCNY that awards PhDs in engineering, all CUNY undergraduate colleges, including the seven community colleges, are eligible to apply for NSF grants as a PUI.

As a CUNY investigator, it benefits you to submit your proposal under the RUI program whose explicit purpose is to help faculty build research capacity at their home institutions and to support the integration of research and undergraduate education. The main difference between an RUI submission and a standard NSF disciplinary submission is that all RUI proposals must include a RUI Impact Statement. This supplementary document allows the PI to explain the impact that the funding would have on his or her career, on the research environment of the school, and on the preparation of students for advanced degrees. The impact statements are discussed in the study panel and have a bearing on funding decisions.

While CUNY as a whole has significant NSF funding, only seven RUI grants have been awarded to our faculty since 2013. For more information look up NSF solicitation number 14-579.
2016 Research In the Classroom Workshop

Integrating authentic research into the undergraduate classroom is a way to broaden participation in research beyond the traditional apprenticeship model. The University is committed to engaging undergraduates in research and, to promote this aim, faculty representing all of the CUNY colleges recently attended the second Research in the Classroom (RIC) Workshop at John Jay College on March 11. The workshop focused on providing faculty with knowledge and skills to assist them in developing their own course-based research projects. Faculty-led breakout sessions offered a variety of discipline-specific approaches.

The keynote lecture was given by David Lopatto, Director of the Center for Teaching, Learning and Assessment at Grinnell College, who is a nationally recognized expert in assessing and measuring outcomes related to engaging undergraduates in research. More than 40 CUNY faculty participated in the program by giving short talks and poster presentations.

The second round of the Research in the Classroom Idea Grant program was announced at the workshop (submission deadline: September 9). Details of the grant program can be found at www.cuny.edu/research.

Carmen Kynard (John Jay) discussing her project on rhetorical analyses of social justice groups’ use of multimedia communications.
Major Funding for Research on the Urban Environment

Dr. Hamid Norouzi, a professor of Construction Management and Civil Engineering Technology at the New York City College of Technology received three federal research grants in 2015. The U.S. Department of Defense and the Army Research Office awarded Dr. Norouzi a combined $250K to use satellite-based remote sensing observations and ground data to explore environmental, climate and water resources challenges.

Professor Norouzi also received the prestigious Defense University Research Instrumentation Program (DURIP) award in 2015, which provided funding for a full set of flux towers to be deployed in the New York City urban region. Extreme weather events such as urban heat islands are among the many environmental threats that effect nearly 80% of urban residents in the United States. Dr. Norouzi’s research will provide a better understanding of the thermodynamics of cities using next generation remote sensing measurements coupled with cutting edge modeling and observational platforms.

In another project funded by the Army Research Office, Dr. Norouzi’s team of postdocs, graduate students, and undergraduates explore “The Potential of Using Microwave Emission in Detecting Freeze and Thaw States.” The freeze/thaw state of the earth’s surface significantly affects the surface energy budget, hydrological events, vegetation phenology, the land-atmosphere trace gas exchange, and the carbon cycle. Dr. Norouzi uses multi-frequency satellite microwave radiometry observations to monitor the portion of the earth’s surface that undergoes freezing and thaw cycles. His current global microwave emissivity data is officially published at the NASA National Snow and Ice Data Center (NSIDC) Distributed Active Archive Center (DAAC).

American Chemical Society Journals
Feature City College Research

Mahesh K. Lakshman, a Professor of Chemistry at CCNY, and his research team have developed a new method for cleaving the generally inert carbon-hydrogen bonds found in saturated organic compounds. The subsequent formation of carbon-nitrogen bonds yields new molecules in an efficient manner. Many of the new molecules are structurally similar to deoxynucleosides, compounds that are used as antiviral drugs, thus could be of importance in the development of novel pharmaceuticals.

This study, “Ruthenium-Catalyzed C–H Bond Activation Approach to Azolyl Aminals and Hemiaminal Ethers, Mechanistic Evaluations, and Isomer Interconversion,” was published in ACS Catalysis. Professor Lakshman was invited to feature this work on the cover of issue 3 of the journal, published on March 4.

Barbara Zajc, a Professor of Chemistry at CCNY, and her team that includes CCNY and external collaborators, have synthesized and studied the shapes of polycyclic aromatic hydrocarbons with specifically placed fluorine atoms. Fluorine features prominently in a large number of commercially marketed pharmaceuticals. In the described work, the fluorine atom is involved in the modulation of the shapes of compounds, a feature that has wide ranging implications, from novel materials to biological processes.

This study, “Regiospecifically Fluorinated Polycyclic Aromatic Hydrocarbons via Julia–Kocienski Olefination and Oxidative Photocyclization. Effect of Fluorine Atom Substitution on Molecular Shape,” was published as editor-selected “Featured Article” on March 22 in The Journal of Organic Chemistry. Professor Zajc was invited to feature the work on the cover of issue 10 of the journal appearing on May 20.
National Science Foundation proposals all have a similar structure: they are 15 pages in length and contain two sections called Intellectual Merit and Broader Impacts. The intellectual merit component summarizes the original scholarship that the Principal Investigator (PI) aims to conduct, and usually contains sections on research objectives, methodologies, and predicted outcomes. The broader impacts, however, are often more difficult to identify and describe, especially for basic scientists. Most scientists use the broader impacts section to write about the ways in which they plan to incorporate undergraduate students into their research. This is obviously a good practice that benefits both investigators and students—but for a broader impacts section to stand out during panel review, it needs to be more creative and comprehensive. PIs can include sections on how their research will be incorporated into the undergraduate curriculum, or be disseminated to the broader community, for example. Outreach to local high schools is also viewed positively by reviewers.

The explicit aim of the MOU is “to provide the framework for pursuing topical collaborative research and educational opportunities,” and to capitalize on “the potential for a long-term strategic relationship.” The memorandum identifies the primary areas for initial exploration and collaboration, including: nano-science & bio-nanotechnology, photonics, structural biology, sustainable cities, and entrepreneurship & enterprise. The MOU also “acknowledges that the collaboration needs to deliver tangible and substantive benefits, defined by ambitious outcomes.” With that goal in mind, the two universities have agreed to explore the development of parallel collaboration with other entities including other universities and research centers, as well as with potential partners in industry, the public sector, and other global cities. In addition, CUNY and Strathclyde have agreed to explore the possibilities for providing mutual support in the pursuit of financial resources, collaborating on the training of doctoral students from both institutions, organizing joint workshops to advance collaborative research endeavors, and developing a model for Associate Laboratories.

Both Universities hope the MOU will further mutually beneficial research collaborations, new opportunities for joint educational work, and the lay the groundwork for student and faculty exchanges, including Research Fellowships. Indeed, several CUNY faculty members visited Strathclyde in April, and the CUNY Advanced Science Research Center is hosting a group of Strathclyde researchers this summer.

The NSF Broader Impacts: Guide for the Perplexed

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Part of the reason why broader impacts are more difficult for researchers to articulate, in contrast to intellectual merit, is that the NSF Grant Proposal Guide (GPG) is vague about what constitutes broader impacts. For example, the GPG includes general statements about involving underrepresented groups, improving STEM education, and increasing economic competitiveness, but the does not fully explain how these goals should be incorporated into a research proposal.

A new organization, called the National Alliance for Broader Impacts, has recently produced a booklet to elucidate more fully how to define and develop the broader impacts section in a proposal. This new publication, called the Broader Impacts Guiding Principles and Questions attempts to do just that: to provide PIs with a resource for writing a strong broader impacts section of a proposal. You can download the new guide at http://www.nsf.gov/pubs/policydocs/pappguide/nsf16001/gpg_print.pdf.
Derecktor Shipyards, a leader in aluminum boat production, will construct a new research vessel designed specifically for the Science and Resilience Institute at Jamaica Bay (SRIJB). The vessel will be the second version of Derecktor’s 65-ft hybrid electric drive scientific catamaran, which includes a BAE-supplied HybriDrive system to allow for silent operation and keel coolers to minimize waste-water discharge.

The Science and Resilience Institute at Jamaica Bay was awarded $7.7 million by the NYS CUNY 2020 program to fund both the vessel and a top-tier research and engagement facility located at Floyd Bennett Field. The SRIJB focuses on environmental resilience, climate change, and urban sustainability through the revitalization of Jamaica Bay.

The project is a joint effort between Brooklyn College and Kingsborough Community College. The boat build will take approximately 16 months with delivery to the KBCC marina anticipated in June 2017.

CUNY Energy Institute Participates in 2016 Advanced Energy Conference

The Energy Institute was invited to exhibit at the 2016 Advanced Energy Conference. Faculty and students set up a booth that displayed eight posters describing ongoing research projects and also exhibited some battery cells. A total of 30 graduate students and staff from CCNY and Urban Electric Power explained current R&D work to numerous visitors over the two day period. Dr. Ellen Williams, the Director of ARPA-E, showed a slide of CUNY battery research in her keynote address. She mentioned that this ARPA-E funded project led to the formation of Urban Electric Power.

Did You Know?

The Office of Research Compliance would be happy to present any of the workshops listed below at your campus.

Each workshop requires a minimum of 10 attendees. Depending on the length of the selected workshop, 1-3 credit points towards CITI certification may be awarded for attending. To schedule a workshop, please contact Heather Ferreri, Assistant Director for Research Compliance, at heather.ferreri@cuny.edu.

- Human Research Protection Program 101: Overview of the CUNY IRB Process & Open Q&A with an IRB member. Information regarding what constitutes human subjects research and what types of research is considered exempt vs. expedited.
- Student Research & Faculty Advisors: Roles and Responsibilities
- Project Management: Tools & skills needed to proactively manage research projects effectively
- Prisoner Studies: Considerations for working with and collecting data from incarcerated individuals
- Collaborative Research: Best practices and tools for collaborative research including data sharing.
- Conflict of Interest: Managing competing commitments
The CUNY ASRC Seed Program is a funding opportunity that encourages faculty members in relevant disciplines from across the colleges to take full advantage of the resources and instrumentation based at the Advanced Science Research Center. In this round of funding for this new grant program, sixteen faculty members from Queens, Hunter, CCNY, Medgar Evers, Brooklyn, CSI, and Lehman were awarded $10,000 each to engage in interdisciplinary research projects with faculty in one of the five core initiatives: nanoscience, photonics, structural biology, neuroscience, and environmental sciences.

Lead PI: Sihong Wang
College: City College
Title of Proposal: Experimental Study of H and O Isotope Fractionation During the Formation of Evaporites: Implication to the Regional Climate Change During the Uplift of Qinghai-Tibetan Plateau
ASRC Investigator: Peter Groffman

Lead PI: Carlos Meriles
College: City College of New York
Title of Proposal: Scanning Thermometry With Nanoscale Resolution
ASRC Investigator: Elisa Riedo

Lead PI: Michele Vittadello
College: Medgar Evers College
Title of Proposal: Mitochondrial/Photosynthetic/Oxidative Field Effect Transistors via Nanoscale Patterning
ASRC Investigator: Elisa Riedo

Lead PI: Peter N. Lipke
College: Brooklyn College
Title of Proposal: Proteomic Analysis of Amyloids in Fungal Biofilms
ASRC Investigator: Rinat Abzalimov

Lead PI: Mahdieh Allahviranloo
College: City College of New York
Title of Proposal: Generating Multidimensional Disruption Index for Mobility During Extreme Climate Events
ASRC Investigator: Charles Vorosmarty

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Title of Proposal: Experimental Study of H and O Isotope Fractionation During the Formation of Evaporites: Implication to the Regional Climate Change During the Uplift of Qinghai-Tibetan Plateau
ASRC Investigator: Peter Groffman

Lead PI: Azriel Z. Genack
College: Queens College
Title of Proposal: Fabrication of Micro-layer Assembly
ASRC Investigator: Jacob Trevino

Lead PI: Carmen Melen dez-Vasquez
College: Hunter College
Title of Proposal: Evaluation of Tunable Stiffness Biogels As A Platform for Enhanced Myelin Formation
ASRC Investigator: Rein Ulijn

Lead PI: Sang-Woo Seo
College: City College of New York
Title of Proposal: Three-dimensional Arrayed Surface Plasmonic Sensors for Bio/Chemical Sensing Applications
ASRC Investigator: Jacob Trevino

Lead PI: Peter N. Lipke
College: Brooklyn College
Title of Proposal: Proteomic Analysis of Amyloids in Fungal Biofilms
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Lead PI: Sihong Wang
College: City College
Title of Proposal: Experimental Study of H and O Isotope Fractionation During the Formation of Evaporites: Implication to the Regional Climate Change During the Uplift of Qinghai-Tibetan Plateau
ASRC Investigator: Peter Groffman
Lead PI: Jean-Philippe Berteau
College: College of Staten Island
Title of Proposal: Contribution of Nanostructure Mineralization in Macrostructure Stiffness of Cortical Bone Tissue During Growth
ASRC Investigator: Tong Wang

Lead PI: Cesar Arenas-Mena
College: College of Staten Island
Title of Proposal: Identification of Protein-DNA Interactions At the Development Cis-regulatory Modules In Vivo
ASRC Investigator: Rinat Abzalimov

Lead PI: Mariana Torrente
College: Brooklyn College
Title of Proposal: Epigenetics In Neurodegenerative Disease: Comprehensively Characterizing Histone Modifications in Parkinson’s Disease
ASRC Investigator: Rinat Abzalimov

Lead PI: Dixie J. Goss
College: Hunter College
Title of Proposal: Structural Studies of the Barley Yellow Dwarf Virus RNA Translational Element and 40S Ribosomal Subunits
ASRC Investigator: Amedee des George

Lead PI: Maribel Vazquez
College: City College of New York
Title of Proposal: A Nano-Osteo Fluidic System to Examine Signaling Between Apoptotic and Bystander Osteocyte Cells
ASRC Investigator: Jacob Trevino

Lead PI: Donna McGregor
College: Lehman College
Title of Proposal: Self-assembly of Short Aromatic Peptides to Design A Proton Wire
ASRC Investigator: Rein Ulijn

Lead PI: John Waldman
College: Queens College
Title of Proposal: A New Paradigm for Restoring Large Atlantic Rivers: Assessing the Shared River Concept
ASRC Investigator: Charles Vorosmarty

Lead PI: Aneta Czajkowska
College: Brooklyn College
Title of Proposal: Development of A Nanoparticle System Based On Tripeptide Oil In Water Emulsions to Deliver Au Nanocrystal-Pt Hybrids for Anti Cancer Therapy
ASRC Investigator: Rein Ulijn
The NanoFabrication Facility (NanoFab) located at the CUNY Advanced Science Research Center first opened its doors to users in September 2015. The NanoFab is a shared research space that serves students, faculty, and research staff from CUNY and outside research institutions, government, and industrial partners. The ASRC NanoFab consists of 5,000 square feet of ISO 6 (Class 1,000), ISO 5 (Class 100) and ISO 7 (Class 10,000) cleanroom space, housing 40 pieces of high-end fabrication equipment. Major instrumentation includes a 100 kV high-resolution e-beam lithography system, a field emission SEM, chlorine and fluorine based inductively coupled plasma etchers, several metal and dielectric deposition systems, advanced metrology equipment, and a 3D nanolithography system.

Dr. Jacob Trevino serves as the NanoFab Facility Director, managing a team of 4 engineers that maintain the facility and administer training. Within the first 4 months of operation, the facility has registered over 200 new users from academic institutions and start-up companies from the greater NYC area (see the chart illustrating the user base to the right). The facility is quickly becoming a regional hub for top-down nanofabrication, facilitating research projects in nano-electronics, silicon photonics/nanophotonics, condensed matter physics and materials science, micro-electromechanical systems (MEMS) and nano-electromechanical systems (NEMS), and mono and bilayer semiconductor devices. The facility looks to expand its user base in the region, attracting additional users from the local biomedical research community, additional start-up companies and engaging research programs at other CUNY institutions, including community colleges. Additional information can be found at http://nanofab.asrc.cuny.edu/ or by contacting Dr. Trevino at Jacob.Trevino@asrc.cuny.edu.

### CUNY ASRC Cooperative Postdoc Research Grant Winners

The CUNY-ASRC Cooperative Postdoc Research Grant was established for CUNY faculty, who are not based at the ASRC, to provide support for a postdoctoral scientist who will collaborate on a research project with a permanent member of the ASRC faculty or an ASRC core facility director.

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<thead>
<tr>
<th>Lead PI</th>
<th>College</th>
<th>Discipline</th>
<th>ASRC Co-PI</th>
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<tbody>
<tr>
<td>Dr. Zhongqi Cheng</td>
<td>Brooklyn College</td>
<td>Environmental Science</td>
<td>Peter Groffman</td>
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<tr>
<td>Dr. Hyungsik Lim</td>
<td>Hunter College</td>
<td>Physics</td>
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### Institutional News

**Institutional News**

**ASRC NanoFabrication Facility Expands Its User Base**

**CUNY ASRC Cooperative Postdoc Research Grant Winners**

The CUNY-ASRC Cooperative Postdoc Research Grant was established for CUNY faculty, who are not based at the ASRC, to provide support for a postdoctoral scientist who will collaborate on a research project with a permanent member of the ASRC faculty or an ASRC core facility director.

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<th>Lead PI</th>
<th>College</th>
<th>Discipline</th>
<th>ASRC Co-PI</th>
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<tr>
<td>Dr. Zhongqi Cheng</td>
<td>Brooklyn College</td>
<td>Environmental Science</td>
<td>Peter Groffman</td>
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<td>Dr. Hyungsik Lim</td>
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**CUNY Research**
2015 ABRCMS Award Winners from Hostos Community College

Hostos students Wendy Fernandez and Erik Carlson were awarded travel grants to attend and present their research at the Annual Biomedical Research Conference for Minority Students. Ms. Fernandez has also been selected to participate in the 2016 MIT Summer REU in Biology and Neuroscience.

Did You Know?

Join the CUNY Biotech Club

This past April, the leadership of the Hunter Biology Club founded the CUNY Biotech Club—a cross-campus alliance of CUNY graduate students who are interested in the application of life science research for the development of innovative health solutions. The Club will host events to provide members with opportunities to learn about drug development, healthcare, business, and life science entrepreneurship.

Members of the CUNY biotech club will be a part of GRO-Biotech, an organization connecting the wider NYC community of students and professionals at our peer institutions who share similar interests.

Postdoc Travel Award Winners Round 11A - 2016

Postdoctoral Fellow: Dr. Igor Dikiy
College: CUNY ASRC
Title of Proposal: “Mechanism of activation of monomeric histidine kinases” at the 2016 Gordon Research Conference on Photosensory Receptors & Signal Transduction in Galveston, TX, January 24-29, 2016

Postdoctoral Fellow: Dr. Sebastien Alphonse
College: The City College of New York
Title of Proposal: “Methyl Groups as Probes of Dynamics and Interactions in a 75 kDa Viral RNA-directed RNA Polymerase” at the 57th Experimental Nuclear Magnetic Resonance Conference in Pittsburgh, PA, April 10-15, 2016

Postdoctoral Fellow: Dr. Heike Rebholz
College: CUNY School of Medicine
Title of Proposal: “The Role of CK2 in L-DOPA induced dyskinesia in Parkinson’s Disease” at the 10th Annual FENS Forum of Neuroscience Conference in Copenhagen, Denmark from July 2-6, 2016
Dorthe Eisele was trained in physics and received her PhD in 2009 from Humboldt University in Berlin. After postdoctoral work at MIT she joined the CCNY Department of Chemistry and Biochemistry in 2014. Professor Eisele effortlessly crosses the boundaries of traditional scientific disciplines. Since coming to CUNY she has collaborated with many faculty in other fields including with the ASRC Nanoscience Initiative. Her interdisciplinary and collaborative efforts led to a successful NSF instrumentation grant to purchase a $376K Near-Field Scanning Optical Microscope (NSOM).

Instead of improving the efficiency of current light-harvesting (LH) devices, Professor Eisele’s research aims to learn from nature’s design principles in order to inspire creation of entirely new LH architectures that can be both efficient and robust. She’s passionate about searching for new materials for bio-inspired light-energy transporters and, in particular, about the fundamental science of artificial nanostructures.

Her research is focused on the complex interplay between the structural and optical properties of materials. Her work involves different experimental and theoretical approaches including synthesis, electrochemistry, and optical spectroscopy combined with a variety of microscopy/nanoscopy techniques.

Matthew P. Johnson joined the faculty of Lehman College in the fall of 2013. He has BA and BS degrees in philosophy, mathematics, and computer science. He obtained his PhD in computer science from the CUNY Graduate Center in 2010 and subsequently performed postdoctoral studies at UCLA, University of Southern California, Penn State, and the Weizmann Institute.

His research spans a large number of areas within the field of algorithms, including online and approximation algorithms, mechanism design, and computational geometry. In addition to theoretical contributions, Professor Johnson has maintained an interest in practical problems of interest to industry. This includes work on algorithmic problems in resource allocation in sensor networks and in demand smoothing for sustainable energy distribution.

Since joining Lehman, he has launched an active research program, producing several new publications, which have appeared in top journals and conferences. He has recruited PhD students to the Graduate Center, and makes a point of involving Lehman College undergraduates in his research. He teaches advanced graduate courses at the CUNY Graduate Center, where he serves as the Lehman College representative to the Computer Science Executive Committee.

What is J-FRASE?

The CUNY Junior Faculty Research Award in Science and Engineering is an Alfred P. Sloan Foundation-funded program that aims to support and advance early career STEM faculty at CUNY. In the current round, 33 applications were received from faculty in 14 colleges and in 13 different disciplines.
Luat Voung was appointed to the Physics Department at Queens College in 2010 and since then she has played a key role in both departmental and community initiatives working closely with both students and colleagues.

Dr. Vuong is a graduate of the University of California Berkeley, has a Ph.D. in Applied Physics from Cornell University, conducted postdoctoral work at the ICFO Institute of Photonic Sciences in Spain, and was a Visiting Researcher at Delft University of Technology in The Netherlands. Dr. Vuong is an affiliate faculty member at the CUNY Advanced Science Research Center and Vice-Chair of a new Gordon Research Conference on Plasmonically Powered Processes, a position accorded to highly established, internationally renowned leaders in their field.

Professor Vuong is a very innovative research scientist whose work has had a marked impact on the field of plasmonics. Her lab studies the phenomenon of optical rectification in plasmonic nanocomposites and is working towards developing a solution-processed solar battery. Her lab is also engaged in a study of the optically-induced mechanics of soft matter and liquids. The Junior Faculty Research Award will allow Dr. Vuong’s lab to further address urban environmental issues, particularly electronics recycling. She is also building a prototype that will allow her group to safely dissolve metals from electronics with commercial electrolytes.

Brian Zeglis joined the Hunter College Chemistry Department as an Assistant Professor in January 2015. He has already established himself as an expert working at the intersection of biorthogonal chemistry and radiochemistry. His research has made an impact on the early phases of clinical translation for the first-in-human trials at Memorial Sloan Kettering Cancer Center.

Professor Ziglis’s work focuses on the synthesis, development, and preclinical validation of novel molecular pharmaceuticals for the imaging and therapy of disease, particularly cancer. His wide-ranging expertise has led to a variety of productive collaborations; at CUNY he is working with Dr. Lynn Francesconi (Hunter), and Dr. Rein Ulijn (CUNY ASRC). The Junior Faculty Research award will allow his lab to begin a project to develop a strategy for the pretargeted radioimmunotherapy of pediatric neuroblastoma.

Dr. Zeglis received his B.S. in Chemistry from Yale University in 2004 and his Ph.D. in Inorganic Chemistry from the California Institute of Technology in 2010. He then shifted scientific gears towards translational research, joining the laboratory of Professor Jason S. Lewis in the Department of Radiology at Sloan Kettering as a postdoctoral fellow. He chose to come to Hunter College in part because he believes in CUNY’s mission of providing a first-class education, both in the lab and in the classroom, to students from ethnically diverse and financially disadvantaged backgrounds.

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2016 Junior Faculty Research Award Winners

Brian Zeglis
Luat Voung

CUNY Research Scholars Program
Student Travel Awards

The CUNY Research Scholars Program (CRSP) is the largest mentored research program for students in Associate degree programs in the country. Each year, CRSP provides 180 students from the community colleges and comprehensive schools with year-long, laboratory research experiences. Starting this year, the program added travel awards to enable two to three students from each participating college to collect data or present at a professional conference.

One student at LaGuardia, for example, traveled with a mentor to collect stellar spectra using a 2.4-m Hilter telescope at the Kitt Peak Observatory in Arizona for a project entitled, “The Origin of Diffuse Stellar Clouds in the Milky Way.” Two students from Bronx Community College presented at the American Chemical Society’s Two-Year College Chemistry Consortium (2YC3) held at San Diego City College in March. Three students from Guttman presented at the National Conference on Undergraduate Research (NCUR) in Asheville, North Carolina. At Queensborough, two students have been selected to present their work at the Annual Biomedical Conference for Minority Students (ABRCMS) being held in Tampa in November.
Alumina Energy and CUNY have finalized an agreement that names Alumina Energy as the exclusive commercialization company for the groundbreaking packed bed thermal energy storage (PB-TES) technology. The PB-TES is a cost effective, efficient and industry compatible energy storage solution that can positively impact existing thermal based industrial and commercial business processes and enable the transition from fossil fuels to renewable resources like concentrated solar power.

The packed bed thermal energy storage technology was originally developed at CUNY under a $1.9M Department of Energy Sunshot grant. The lead inventor Dr. Reuel Shinnar (1923 - 2011), was a distinguished Professor (Emeritus) of Chemical Engineering at CCNY and authored or co-authored over 30 patents, several of which are in large scale use. His co-inventors are Jeffrey Morris, Director of the Levich Institute at CCNY, and three former Grove School of Engineering research associates Hitesh Bindra (Kansas State University), Pablo Bueno (Southwest Research Institute), and Ryan Anderson (Montana State University).

Alumina Energy is a renewable technology development and commercialization company located in Santa Monica, California. Alumina's goal is to accelerate the commercialization of transformational early stage technologies developed at universities and research organizations across the U.S.

Most entrepreneurship and incubator programs require applicants to have businesses that have advanced beyond the initial conception stage. In addition, many of these programs primarily target student entrepreneurs enrolled at four-year educational institutions. As a result, community college students often face greater challenges in developing and sustaining their own businesses than students at four-year schools.

To address this need, the Tools for Innovation & Entrepreneurial Success (TIES) in the Community College initiative was created six years ago by a team at Queensborough Community College to provide entrepreneurs with a mentored pathway to success. TIES creates ideation and hands-on critical skill development to assist students in becoming lifelong entrepreneurs. This program is specifically designed to provide community college students—who can face major obstacles in acquiring financial resources and professional mentorship—with access to a unique training opportunity.

TIES is supported by an extensive network of professional mentors and experienced entrepreneurs. The program operates independently of traditional curricula and co-curricular methods. Most recently, the New York City Regional Innovation Node (NYCRIN), partnered with QCC Associate Professor of Business and lead of the TIES program, Christine Mooney, to implement elements of the Lean Launch Pad methodology. Teams were challenged to focus on various aspects of the Business Model Canvas and were pushed to “get out of the building” and perform insightful customer discovery interviews. A highlight of the TIES program this year was a Fireside Chat with Queens native Steve Blank, the creator of Lean Launch Pad, which was moderated by Harry Smith from NBC News.