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A MESSAGE FROM THE DEAN TEAM

After a couple of years of big changes, including the move of thirty-some Science Division faculty to the new CDI building on the South Campus, we have now settled into a nice equilibrium in which our faculty can focus on what they do best: educate our students and perform cutting-edge research.

The Division of Science welcomed three new faculty members for the 2016-17 academic year. Michael Shub joined us as the first Martin & Michele Cohen Professor and as the new Chair of the Math Department. Professor Shub is a distinguished mathematician with a long career (including a previous stint at CUNY) and we are thrilled to have him at CCNY. He is profiled in detail in the section on new faculty. Also joining us as new faculty are two neuroscientists in the Biology Department: Andrey Rudenko joined us after a post-doctoral position at MIT, and Osceola Whitney came in January from a post-doctoral position at New Mexico State University. Both Rudenko and Whitney were appointed as Ruth Elkes Assistant Professors,
supported by a gift from the Ruth and Terry Elkes family. Professors Rudenko and Whitney have both set up shop in spanking new labs in the CDI building’s Neuroscience Cluster.

Every year it is a pleasure to list our student and faculty awards in these pages. Our students continue to be stars, and for the second out of the past three years we are proud to call the College Valedictorian one of our own. Elianna Schwab, who has been making us proud for many years, was not only Valedictorian, but also won an NSF Fellowship for Ph.D. study in astrophysics. Other Division of Science students winning awards as they graduated include the four Jonas Salk Award winners, Christopher Reid, Anika Nabila, Marisol Cortés, and the 2015 Valedictorian Violetta Contreras-Ramírez (students remain eligible for the Salk award after graduation). But the awards rained down all year round, not just at graduation. As usual, our undergrads, under the supervision of Ms. Nkem Stanley-Mbamelu of our Office of Student Success, cleaned up at the Annual Biomedical Research Conference for Minority Students in Tampa, where six of our students came home with awards. Meanwhile, Biology major Emmanuel Dwomoh arranged his own travel and registration at the Meharry Translational Research Center Health Disparities Conference in Nashville and came home with the first-place prize for his poster presentation.

Our faculty continue to win major grants and, while there is not space to list them all, I am happy to highlight here Hysell Oviedo, Assistant Professor of Biology who won a prestigious NSF CAREER award, and Professor of Chemistry, Maria Tamargo who heads up a new $5M NSF Center called “IDEALS”, devoted to increasing minority participation in materials science.

We are exceptionally proud of the work of our faculty and students, but for all of their talent and drive, their success would be hampered without our friends who support the Division of Science. This support is crucial to our work, not just for the financial help it provides, but also for the input and advice we get from those who are invested in our success. This year, as we always do, we profile some of our generous donors: Drs. Sidney and Becca Fleischer and Eva J. and Ira J. Pell. This past year we were extremely grateful to be remembered in the estate of Drs. Sidney and Becca Fleischer and Eva J. and Ira J. Pell. This past year we were extremely grateful to be remembered in the estate of Drs. Sidney and Becca Fleischer, who left the Division of Science a $2.2M endowment to create a Young Investigators Fund. The Drs. Fleischer met at CCNY and graduated in 1952 before moving to Indiana University where they both received Ph.D.’s in Biology before moving on to careers at Vanderbilt University. Each year, the Young Investigators Fund will be able to support both Ph.D. and undergraduate student research stipends and travel, a wonderful way to simultaneously support our joint missions of education and research.

You have no doubt read about the challenges facing City College these days. Indeed, in some respects it has been a difficult year. But we are here to tell you it has not slowed us down, nor distracted us from our core mission. The Division of Science is doing well! Read on.

Dr. Tony M. Liss
Martin & Michele Cohen Dean of Science
Professor of Physics

Dr. Laurent Mars
Associate Dean

Dr. Millicent Roth
Deputy Dean for Undergraduate Programs

Dr. Elizabeth Rudolph
Assistant Dean for Graduate Programs & Assessment
At A Glance
2016 - 17

292
BACHLOS
DEGREES AWARDED

1368
DECLARED
MAJORS

2435
UNDERGRADUATES

124
FULL-TIME FACULTY

16.5 million
GRANT FUNDING

50
GRADUATE
DEGREES AWARDED

04
BS-MS PROGRAMS
* Biochemistry
* Biology
* Biotechnology
* Chemistry

07
UNDERGRADUATE & GRADUATE
PROGRAMS
* Biochemistry
* Biology
* Biotechnology
* Chemistry
* Earth & Atmospheric Sciences
* Mathematics
* Physics

153
STUDENTS SUPPORTED BY
SCHOLARSHIPS AND
FELLOWSHIPS

81%
MEDICAL SCHOOL
ACCEPTANCE RATE

115
UNDERGRADUATES
CONDUCTING
RESEARCH

06
PH.D. PROGRAMS
* Biochemistry
* Biology
* Chemistry
* Earth and Environmental Sciences
* Mathematics
* Physics
Welcome New Faculty and Staff

ANDREY RUDENKO
ASSISTANT PROFESSOR, BIOLOGY

Andrey Rudenko is an Assistant Professor of Biology in the Division of Science whose work focuses primarily in neuroscience and the conceptual mechanisms of what memory is, where it is stored, and how we can manipulate it. “My background is actually pretty wide,” Rudenko explains. Of his undergraduate education in Ukraine, he says that “most broadly, my major was genetics, and my minor was organic chemistry, but I took over a hundred courses” with biology, genetics, and zoology faculty. Rudenko continued his genetics research during his Ph.D. at Oxford, where he became interested in neuroscience and its cognitive aspects, and areas of biology related to brain behavior. After his doctorate, Rudenko found a way to translate his experience working with the physiological aspects of enzymes into a more brain-based vein of research, and his interests took him to Harvard to learn more about mammalian models and neuroscience. Rudenko comes to CCNY from MIT, where he found himself after his time at Harvard and where the current focus of his research – a neuroscientific approach to memory mechanisms in the brain – was developed most intensely. Rudenko’s most widely-known paper, published on his work involving the genetic basis of Post-Traumatic Stress Disorder, was written at MIT, and has been covered by major mainstream news publications. “Those papers established very intriguing connections between the genomic plasticity of neurons and the plasticity of cognitive flexibility, and that was a really big deal – genomic plasticity versus thinking plasticity,” Rudenko explains. He does a lot of work with Alzheimer’s models as well – how we might be able to modify the memory mechanisms that regulate and normalize brain function. Since moving to CCNY, Rudenko has been listed as an author of a paper recently published in Cell, a biology journal, which demonstrated a physical but non-invasive method of high-precision deep-brain stimulation that can affect neuron activity. These are the sorts of projects he hopes to continue at his lab in the City College Center for Discovery and Innovation, which will be staffed in part by CCNY biology undergraduates and which will focus on engram, a physical organization of memory in the brain. Of these students, Rudenko says that though he hasn’t had too much experience with them, he’s already met some pretty great students here. He takes a lot of care with his teaching: “it’s up to you,” he says speaking of his role as someone in a position to mentor students, “to make them better.”

“Rudenko found a way to translate his experience working with the physiological aspects of enzymes into a more brain-based vein of research, and his interests took him to Harvard to learn more about mammalian models and neuroscience.”
Welcome New Faculty and Staff

Micheal Shub has held positions at prestigious institutions both inside and outside academia, including Brandeis University, the University of California at Santa Cruz, the University of Toronto, IBM Research, and the Argentinian National Scientific and Technical Research Council (CONICET). He joins the CUNY and City College community as a specialist in dynamics and dynamical systems, as well as the complexity of real number algorithms. In the fall 2017 session Shub will teach a special topics course in mathematics at the CUNY Grad Center as well as an honors linear algebra and vector calculus course at CCNY. He is involved in several research projects with CCNY colleagues as well as an international community of mathematics scholars and researchers.

This summer he attended several international conferences, giving talks at two of them: part of an effort to “raise the CCNY flag,” as Shub puts it. He is a Fellow of multiple associations and societies, and participated this summer at the triennial meeting on Foundations of Computational Mathematics – a society whose first meeting he organized, as founding Chair, in 1997. Of his colleagues within the Mathematics Department at CCNY, Shub says he finds them all “committed to mathematics, the department, and our students.” He looks forward to teaching those students, and to continuing progress on research projects fueled by collaborative efforts and the innovative thinking that has already helped Shub make so many advancements in his field.

“

He is a Fellow of multiple associations and societies, and participated this summer at the triennial meeting on Foundations of Computational Mathematics – a society whose first meeting he organized, as founding Chair, in 1997.
Dr. Whitney is invested in furthering his students’ horizons, and hopes to get them excited not just about his research, but also about research going on in different parts of the country, different labs, maybe even in different countries. “I’m really looking forward to bringing that experience to the students.”

OSCEOLA WHITNEY
ASSISTANT PROFESSOR, BIOLOGY

Dr. Osceola Whitney, Assistant Professor of Biology, comes to The City College of New York with a background in neuroscience. He uses animal models to understand how the brain works in controlling vocal learning. He’s been focused primarily on grant-writing since arriving at CCNY, looking forward to start a large research collaboration. Whitney uses songbirds – zebra finches in particular – to study neurobiological processes. “I’m particularly interested in molecular mechanisms in the brain,” Whitney offers, “that allow for this vocal learning behavior.” In the fall, he’ll be teaching a class on the biology of organisms, but he’s already been doing some advising with City College students in the biology department. “I’ve done a little bit of outreach to let students know that I’m looking for students interested in my work. I’ve also done some guest lectures and through that I’ve been able to meet students,” Whitney explains. He finds the students he’s met really great, and hopes they’ll come work with him in his lab as soon as things are up and running.

Dr. Whitney comes to us from the University of New Mexico, where he completed a post-doctorate working with parakeets. Before that he spent time at Florida State University (where he completed his Ph.D. and was introduced to songbird research) and then moved to Duke University for post-doctoral study. He is originally from New York and is happy to be back. “I always thought of myself,” he says, “as a New Yorker, and it was very difficult for me to leave. But I am glad I did; I had many great experiences. Now that I’ve come back to New York, I’m interested in connecting with some of the students who, like me, may have grown up here but haven’t been any place else.” Dr. Whitney is invested in furthering his students’ horizons, and hopes to get them excited not just about his research, but also about research going on in different parts of the country, different labs, maybe even in different countries. “I’m really looking forward to bringing that experience to the students.”
Welcome New Faculty and Staff

LAVADA YARDE
ADMINISTRATIVE ASSISTANT, CHEMISTRY AND BIOCHEMISTRY

Lavada Yarde came to the Chemistry and Biochemistry department at City College as an administrative assistant in January of 2017, and has already gained experience working with students, faculty, and staff in the Division of Science. “Departments take a lot to run,” Yarde explains. “I handle a wide variety of jobs – from procurement and purchasing to hiring and supervising work study students for the departmental office. She recognizes her important role of assisting her ‘clients’, the faculty and students of the Chemistry and Biochemistry Department. Yarde finds the faculty easy to work with, down-to-earth and helpful. She enjoys having the opportunity to interact with so many professors and instructors. She’s also currently a student at City College, in the sociology department. “I’d like to get my Master’s degree in Public Health,” Yarde says of her future plans. “I feel that would tie together my interests in sociology and in science.” In the meantime, Yarde feels that being a student makes her job easier – and makes her uniquely qualified, to help other students coming into the department with questions and concerns. She likes being able to point students in the right direction. “I can really relate.” Yarde says of the students coming into the office. Yarde looks forward to getting to know the Chemistry and Biochemistry department family even better as she continues in her position, and can’t wait to see how her role develops and evolves.

“Yarde feels that being a student makes her job easier – and makes her uniquely qualified, to help other students coming into the department with questions and concerns. She likes being able to point students in the right direction. “I can really relate.”
ELLIANNA SCHWAB

Ellianna Schwab, the 2017 City College valedictorian and an NSF Research Fellowship recipient, is headed to the University of California at Berkeley to pursue a Ph.D. in astrophysics. Schwab, who is the first of her siblings to graduate from college, plans to continue the research she started in the Division of Science, which involves the intersection of theoretical electromagnetism (this concerns electrical fields and charges), general relativity, and observational astronomy. “Celestial objects,” Schwab explains, “provide great test environments for extreme physics,” and as such this intersection of interests paves the way for a multitude of exciting investigative opportunities. Schwab has worked hard to get to where she is: “before attending CCNY,” she offers, “I thought of myself as an armchair astronomer.” Schwab read popular science books like those by theoretical physicist and string theorist Brian Greene and watched television shows like Neil DeGrasse Tyson’s Cosmos, and it occurred to her that she—like the authors of these texts—could also make a living studying the cosmos. This is what motivated her to apply to The City College of New York, and once she arrived she discovered that her love of the universe was coupled by a love of mathematics: the perfect combination for a career in astrophysics. “This newfound passion,” Schwab says of mathematics, “shaped my approach to astrophysics research during my undergraduate years.”

There are no astrophysicists on staff in CCNY’s physics department, but that didn’t stop the department’s faculty from being invaluable to Schwab’s research. Professors like James Hedberg, Michael Lubell, and Timothy Boyer, Schwab says, “were always willing to support and encourage my research and to explore the intersections between astronomy and their own work, which helped me strengthen the theoretical and instrumental basis of mine. I wouldn’t be where I am today,” Schwab continues, “without their tremendous support.” That support came from outside the physics department, too. Schwab credits mathematics professor Doris Pichardo with helping her love and understand mathematics, while Honors Center advisors Jennifer Lutton and Alida McKee (Schwab graduated from the CUNY Macaulay Honors College at CCNY and with research honors in physics and a 3.9 GPA) “always made the time to offer advice and encouragement” and helped show Schwab how to navigate the collegiate systems and institutions of academia.

Schwab has a lot of work ahead of her at the University of California at Berkeley, but she’s looking forward to it. She’ll have the opportunity to continue working on instrumentation (which is something she was introduced to when working on a radio telescope project with Professor Hedberg at CCNY), as well as investigations of low-mass star magnetism and exoplanet habitability and the search for low-frequency gravitational waves. City College has prepared her for this. “My professors always opened their doors to my endless questions during office hours and over email, helping me build my mathematical and theoretical toolbox from the ground up,” Schwab says. “I came to CCNY with the distant dream of being an astrophysicist, and these people helped make my dream a reality.”
Four out of this year’s eight recipients of the prestigious Salk awards are City College students from the Division of Science. The award, founded in 1955, honors Jonas E. Salk, a City College graduate (’34) who developed the first anti-polio vaccine, and recognizes its winners for their outstanding study, research, and scholarship in medical and biological fields. Students are selected for their high abilities and are judged likely to make significant contributions to medicine and research — they are chosen on the basis of original research papers completed with CUNY mentors. It is perhaps unsurprising that so many City College students are among this year’s Salk scholars; Nkem Stanley-Mbamelu says that professors in the Division of Science “really believe in our students,” and strive to “give them every opportunity.” Indeed, all four of the City College recipients will be going on to impressive academic careers at top-tier medical schools. Violetta Contreras-Ramirez, a first-generation college student who majored in both biology and psychology at CCNY, is attending Yale University’s School of Medicine. Biochemistry major Marisol Cortés, whose involvement in research on Parkinson’s Disease has led to funding from the Research Initiative for Scientific Enhancement as well as opportunities to present her work at conferences and competitions, will be attending Johns Hopkins University School of Medicine to earn her Ph.D. in biochemistry and cellular/molecular biology. Anika Nabila, a Macaulay Honors College student at City College students who minored in English and has a passion for writing as well as science, will work towards her Ph.D. in neuroscience at the Weill Cornell Graduate School of Medical Sciences. Biology major Christopher Reid, who has remained deeply involved in his community despite the time spent in a genetics lab which earned him a Maximizing Access to Research Careers (MARC) fellowship and trips to conferences like ABRCMS, will continue his studies in neuroscience at Harvard Medical School. Each Salk recipient is awarded an $8,000 stipend to be appropriated over three-to-four years of medical studies, as well as diagnostic kits that include otoscopes and opthalmoscopes and achievement citations.
Every year, the Division of Science sends many of its highest-achieving students to conferences, competitions, and summer programs across the country. One of the most frequently attended conferences is the Annual Biomedical Research Conference for Minority Students (ABRCMS for short) – an event at which City College students always excel. This year’s ABRCMS was held in Tampa, Florida and included 1,800 visual and oral presentations given by undergraduate and post-baccalaureate students from across the country and Puerto Rico. Of the City College students who compete and present at conferences like this one, Nkem Stanley-Mbamelu, who is the Associate Director of the City College Academy for Professional Preparation, says “they don’t shy away. They really own their projects.” Students like Markova, Forrester and Gonzalez are fiercely independent and devoted to their work. This attitude wins them accolades on high-profile and competitive stages. “The mentors prepare them very well,” Stanley says of the faculty who support and supervise research and labs. The 2017 ABRCMS will be held in Phoenix, Arizona on November 1-4, and we can’t wait to see what our science students do next. For more information on this year’s conference as well as this past year’s, visit http://www.abrcms.org.

Svetlana Markova and Candace Forrester both received awards for their presentations in the Engineering, Physics, and Math category of the conference, while Kevin Gonzalez won for his research in the Developmental Biology category.
This year was the 30th anniversary of the Collegiate Science and Technology Entry Program (CSTEP), and the 25th anniversary of the student conference it runs. CSTEP is a New York State grant-funded program that involves students from across the CUNY and SUNY schools, as well as students from private colleges and universities in New York. The initiative was designed, as its website puts it, to increase, support, and encourage historically underrepresented and economically disadvantaged students pursuing careers in STEM and health-related fields, and students in the CCAPP program, CCNY’s CSTEP program, are consistent winners at the program’s annual conference. The conference is comprised of oral and visual presentations of student research, and this year three CCNY students took home top prizes. Emmanuel Dwomoh, a biology major in the Division of Science, earned a Distinguished Award for first place in the Material/Computer Science category after presenting a research paper titled “Synthesis and characterization of Polycaprolactone (pcl) membranes as scaffolds for bone tissue regeneration,” while Rahma Awad won first prize for her presentation in the Biology category titled “Is JAK/STAT signaling pathway necessary and sufficient for CST axonal sprouting?” and Svetlana Markova won first prize in the Medicine category for her oral presentation titled “4DMRI and Respiratory Motion Assessment for Radiotherapy Planning” (also a winning paper at this year’s ABRCMS). Faculty members from the Division of Science mentor every student who competes in a conference like CSTEP, though the students really take ownership of their research. “Each one of them can, on their own, explain to you and tell you what is going on with these projects,” says Nkem Stanley-Mbamelu, who is heavily involved in sending City College students to such conferences, competitions, and programs. “It’s their work.” This work is impressive – City College also had three first-place winners at the 2016 conference, and five first-place winners in 2015. For more information about CSTEP, visit http://stepforleaders.org/cstep/aboutcstep.asp.

City College students are consistent winners at the program’s annual conference. The conference is comprised of oral and visual presentations of student research.
Scholarships

Bernard Levine Scholarships

During the 2013-2014 academic year, Dr. Bernard Levine ('50) made a generous donation which established the Bernard B. Levine Scholarships in Science and Mathematics. Dr. Levine, who pursued a career in Academic Medicine at NYU after receiving his MD from their medical school, was involved in Allergy and Immunology research as well as pharmaceutical drug development analysis. The fund he endowed provides scholarships to outstanding students majoring in one of the following scientific disciplines: Biology, Chemistry/Biochemistry, Earth and Atmospheric Sciences, Mathematics, and Physics. Students are selected based on both outstanding academic achievement and promise and potential for continued success, and this year’s recipients certainly fit that mold.

Adem Idrizzi is an undergraduate majoring in Biology, a first generation college student who aims to become a biomedical researcher. He works in the lab of Professor Itzhak Mano, whose research focuses on neurodegeneration resulting from stroke and neural necrosis. His research interests also include, more generally, developmental neurobiology, as well as pharmacogenomics (the effect of differentiating genetic makeups on drug responses). Idrizzi is also involved in volunteering work – his interest in developmental neurobiology was sparked when he began teaching children with mental disabilities how to swim. Idrizzi plans to continue on to graduate study after he earns his undergraduate degree.

Svetlana Markova won first-place awards at both this year’s Annual Biomedical Research Conference for Minority Students (ABRCMS) and Collegiate Science and Technology Entry Program (CSTEP) competitions for her research titled “4DMRI and Respiratory Motion Assessment for Radiotherapy Planning,” work that has come out of her time spent in the medical physics department at Memorial Sloan Kettering Cancer Center under mentor Dr. Guang Li. Markova is also active in the CCNY student community – she belongs to the CCNY Biology Club and works as a mentor for that organization.

Clyde Thomson is a senior in the Earth and Atmospheric Sciences department at CCNY who has been actively involved in both research and activism when it comes to both energy and climate. He has spoken at student-organized events as well as contributed to reports and presentations by several City College faculty members across a range of disciplines within the EAS department.

In addition to his support for undergraduate students, Dr. Levine has also provided fellowships to fund Ph.D. students. In this inaugural year for Ph.D. support, Andrea Cardenas, Alana Melendez and Constantijn van der Poel received awards. All three are active scholars and researchers. Andrea conducts research in the lab of Professor Anuradha Janakiraman of the Department of Biology. Before entering the Ph.D. program Andrea worked on understanding how proteolysis regulates cell division in the model bacterium E. coli. About her first experience with research, Andrea remarks, “It was incredibly satisfying being able to put into practice theoretical knowledge that I had acquired over the years in science classes.” Alana Melendez is a member of the lab of Maria Tzortziou of the Department of Earth and Atmospheric Sciences. She comes to us from the Masters program; she earned an MS degree for her work on fluctuations in dissolved organic carbon (DOC) concentrations in tidal marsh-estuary systems. Constantijn van der Poel is a Physics major who is on target to study theoretical high energy particle physics in the lab of Professor V. Parameswaran Nair.
In June of 2016, The City College of New York was pleased to announce a large donation from the Chleck Family Foundation which enabled the creation of the Chleck Family Scholarship and Graduate Research Fellowship in Science. This fund supports both undergraduate and graduate students with financial need who are majoring in Biology, Chemistry, Earth and Atmospheric Sciences, Mathematics, or Physics. It was established in honor of CCNY alumnus David Chleck ('48) – himself a chemist and entrepreneur. Such a scholarship is an opportunity for young scholars and scientists to pursue their research, and the inaugural recipients are outstanding examples.

The Chleck Family Scholarships come in three forms. First are 4-year scholarships for entering freshmen who demonstrate promise in science. The recipients are Hanna Towfiek, Seher Ali, and Michaela Osei; all three are majoring in Biology.

Chleck scholarships are also awarded to upper level undergraduate students majoring in science who demonstrate sustained high-achievement in both their majors and overall. Kevin Gonzalez, one of the two in this category, was first-prize winner at this year’s Annual Biomedical Research Conference for Minority Students (ABRCMS) for his research in developmental biology. He is conducting research in the lab of Professor Mark Emerson who studies the development of the vertebrate retina at cellular and molecular levels. He was accepted to the MARC (Minority Access to Research Careers) program as well – an initiative funded by the National Institutes of Health which aims to increase the number of underrepresented minority groups in the sciences by providing stipends and research support to talented, qualified applicants.

Cody Duell, the second such recipient, graduated from CCNY at the end of the Spring 2017 term and is headed to Cornell University for graduate study. His research interests involve experimental nuclear/particle physics. He was also the recipient of several departmental honors this May. He was awarded Research Honors in Physics for his work with faculty mentor Dr. Marilyn Gunner, and also received the Ward Medal, which is presented annually to the Physics majors with the highest grade-point averages in Physics and Mathematics classes. In addition to these recognitions, Duell was also awarded the Bernard Hamermesh ’40 Scholarship, which recognizes outstanding, graduating Physics majors who have demonstrated the skills, knowledge, techniques, and imagination necessary to becoming a successful, actively contributing experimental physicist.

In addition to undergraduate scholarships, the Chleck Family donation also provides for Ph.D. research fellowships, and this year’s inaugural recipients – Andres Hernandez and Tamar Skaist – are active scholars and researchers in the CCNY and CUNY scientific communities.

Such a scholarship is an opportunity for young scholars and scientists to pursue their research, and the inaugural recipients are outstanding examples.
Joshua Wallman was a beloved Professor of Biology at CCNY for nearly 40 years specializing in Neuroscience. He was a pioneering vision researcher who made significant contributions to the understanding of eye growth and myopia, and the neurophysiology and psychophysics of eye movements and visual perception. Professor Wallman passed away in 2012. To honor his memory and legacy at CCNY his family and friends established the Josh Wallman Scholarship. The Josh Wallman Scholarship is given to full-time students pursuing studies in animal behavior, sensory perception, ophthalmology, neuroscience or related areas. Dr. Wallman was particularly interested in students who evidenced a passion for their chosen subject matter and had the potential to make meaningful contributions in their field of interest. The inaugural recipients are two doctoral students doing very different kinds of work, which reflects the breadth of Professor Wallman’s intellectual interests. Adanna Alexander conducts research in the lab of Professor Christine Li. She pursues studies in molecular neuroscience, with the aim of understanding the molecular basis of brain pathologies in Alzheimer’s disease. Yijing Shan studies human eye movements (which were a particular interest of Dr. Wallman), specifically the interaction of voluntary and involuntary brain signals in generating eye movements.

We are grateful to the friends and family of Professor Wallman for their dedication and commitment to his students and CCNY.
**FUNDING PAST TEN YEARS**

**RESEARCH FUNDING : 2012 -2017**

- **2012-13**
- **2013-14**
- **2014-15**
- **2015-16**
- **2016-17**

**2016 - 2017 FUNDING SOURCE**

- NSF 37% $6,051,739
- NIH 42% $6,890,423
- Others 6% $932,650.6
- NASA 7% $1,176,346
- NY State 3% $573,600
- DoD 3% $504,258
- Private 2% $402,269

**Science Division Funding**

**2007 - 2016**

- Recovery Act Grants
  - 2007-08 $15,382,365
  - 2008-09 $18,207,481
  - 2009-10 $19,037,542.05
  - 2010-11 $18,919,627.13
  - 2011-12 $18,475,260.56
  - 2012-13 $18,050,160.3
  - 2013-14 $17,149,218.78
  - 2014-15 $17,046,540.46
  - 2015-16 $16,531,285.6
  - 2016-17 $12,722,864
## MAJOR FUNDING

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### 2016 - 2017 FUNDING BY DEPARTMENT

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### PERCENTAGE OF FUNDED FACULTY BY DEPARTMENT

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<th>Department</th>
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CCNY professor Vinod Menon has kept very busy. The physicist, who studies the interaction of light with matter at the level of the nanoscale, is the principal investigator at the Laboratory for Nano and Micro Photonics (LaMNP), which has already produced a wealth of exciting research and breakthroughs in the field of photonics and promises more. The laboratory, which is staffed by post-doctoral fellows, CCNY and CUNY graduate students, City College undergraduates, promising high schoolers, and visiting researchers, finds motivation in “the quest to develop next generation computing technologies,” and that forward-thinking focus is evident in everything Dr. Menon does.

In a 2016 issue of the journal Nano Letters, for example, Menon and his team published breakthrough research in lasing – light amplification by the stimulated emission of radiation, which has a multitude of applications in various fields. In particular, it could help other researchers and scientists develop high-performance, low-cost photonics and optoelectronics devices. Photonics is a field enmeshed in nearly every aspect of our lives, from entertainment to national security (Menon has received research support from a wide variety of institutions ranging from private foundations, to the National Science Foundation, to the Army Research Office), so the implications of Menon’s research are far-reaching.

In 2017, Menon led a group of researchers in discovering a new class of artificial media, photonic hypercrystals to control light-matter interactions, which allows scientists and developers to overcome several limitations in preexisting approaches to controlling such interactions (which are the basis of a huge range of technologies). The research appears in an issue of the Proceedings of the National Academy of Sciences from May 2017. In July 2017, meanwhile, Nature Photonics published research conducted by Menon and another team that explores how we might manipulate a new property of electrons – the “valley” property – in order to develop an entirely new class of technology.

Menon is not just an active researcher; he’s also an active teacher, and much of his research is conducted alongside CCNY students. Indeed, Zheng Sun, a physics Ph.D. student at City College and LaMNP, is listed alongside Menon as a lead author of the July 2017 paper.

This account of Dr. Menon’s research is by no means comprehensive: a quick glance at the recent research on LaMNP’s website reveals a host of other achievements, discoveries, and breakthroughs, including a U.S. patent filed in 2013 for a flexible laser technology. Still, Menon somehow finds time to engage in outreach as well as active research. Hosting high school students at his lab is one of the ways Menon does this; another is his participation in the CUNY-sponsored series Science Goes to the Movies (available on PBS). The series explores the use of science in cinema; in one episode Dr. Menon explains the holograms in movies like Iron Man and Star Trek. By engaging in such outreach, Menon hopes to pique the interest of young scientists-to-be, and encourage motivated students and scholars to participate in the kind of groundbreaking research happening at the Laboratory for Nano and Micro Photonics, and beyond.
Dr. Benjamin Black, a professor in the Earth and Atmospheric Sciences Department at CCNY, recently published an article titled “Global drainage patterns and the origins of topographic relief on Earth, Mars, and Titan” in Science, the premier global science weekly journal. The research, which Black conducted alongside a team of scientists from across the country, examines the ways in which river systems or the remnants of river systems align (or don’t) with large-scale planetary topography, how these relationships vary from planetary body to planetary body, and what such variability might indicate. The work started years ago as a conversation between colleagues about Titan, Saturn’s largest moon. That moon is the only other body in our solar system (that we know of) with actively operating rivers—though on Titan these rivers are composed of hydrocarbons. Titan’s hydrological cycle, Black explains, doesn’t quite balance, and the group wondered if rivers could be compensating for that. “That’s where the project really started,” Black says: “with a funny, hard-to-explain observation about this world, Titan. We hypothesized rivers might be part of the answer, and we had done some work on Titan’s rivers in the past, so we thought – why not test this idea. In the process, what we found was that maybe Titan’s rivers don’t explain that particular mystery, but they do open a whole additional set of what might be even more interesting questions.”

The process of conducting this research, looking into these questions of the relationships between river systems and planetary topographies, and the later work of writing the article for Science gives Black a renewed perspective on how the scientific process relates to the process of writing. “The full story of how a research project evolves often doesn’t get told, because it can be so long and complicated, and the origin of the project may not relate to its ultimate conclusions” Black says. “The scientific process often comes out as really linear in a published paper. You have all the things you want to say, and that gets compressed, and compressed, and compressed, until there’s nothing extra. In the process, it becomes this very compact piece of writing, and of science, and you’ve laid everything out in the best, most logical way.”

A supplement was published alongside Black’s article, and he points to that as key to the overall story of the research. “That’s one lesson for students,” Black points out. “You should always, always read the supplement, because that’s where you figure out where all the information is coming from. Black also highlighted recent efforts to ensure that science is reproducible. “One of the things I’m really proud of,” he says, “is that we put the pieces out there, the ingredients that went into the project, for example the modeling code our team used.” In turn, some of those ingredients, like the maps of rivers on Earth and Mars, were the products of previous scientists’ work made publicly available. “That’s really powerful,” Black says. “They made their data easily accessible, and then that enables other people to use their work, rather than just showing an image which you can’t really reuse. That’s something that I try to impress upon students, is how you can make something that other people can use.”

It can be both exciting and daunting to participate in such a tradition of incredible thinkers and incredible ideas, Black says, especially when students read an article without knowing how much goes into the publication of research – how many dead ends, how many wrong turns.

“His recent research examines the ways in which river systems (or the remnants of river systems) align or don’t with large-scale planetary topography, how these relationships vary from planetary body to planetary body, and what such variability might indicate.

From its inception as an idea to its publication, Black’s Science article took about five years to produce. “I think it really needed to take that long, and I think it really benefited from taking that long,” Black says. “Really, it’s a story about everything, about the solid earth, the crust, the history of the planet – but it’s also about all the things we see changing on the surface at much more rapid time scales. It’s about that history, through hundreds of millions or billions of years, somehow being recorded in something that changes as quickly as a river.” Black is already thinking about where to go next with the concepts introduced in the article, and he looks forward to the challenge. “I think it’s good and natural that doing science – doing any kind of serious investigation – is hard,” Black offers. “If it’s really easy to finish a project, then maybe you’re doing something wrong.”
Spotlight on Supporters

DRS. SIDNEY AND BECCA FLEISCHER

The purpose of the Fleischer Fund is to provide annual stipends to support the research activities of Ph.D. and undergraduate Division of Science students as well as conference travel to present their research.

The Estate of Sidney Fleischer generously contributed $2.2 Million to establish the endowed Drs. Sidney and Becca Fleischer Young Investigators Fund. The purpose of the Fleischer Fund is to provide annual stipends to support the research activities of Ph.D. and undergraduate Division of Science students as well as conference travel to present their research.

Sidney Fleischer, Ph.D. earned a chemistry degree at the City College of New York in 1952, where he met his future wife and fellow student Becca Patras. The two went on to earn their Ph.D.’s from Indiana University. Dr. Fleischer was a renowned molecular biologist who was famous for his work on calcium and discovery of the ryanodine receptor. The ryanodine receptor is a class of intracellular calcium that releases channels which play a key role in triggering muscle contraction. Dr. Fleischer’s discovery has allowed scientists across disciplines to make other discoveries in uncovering links to human diseases such as malignant hyperthermia, central core disease, and sudden cardiac death. Becca Fleischer, Ph.D. was an expert in the function of the Golgi complex. Drs. Fleischer both co-authored many publications and worked together to advance the field of cell signaling.

Dr. Sidney Fleischer retired from Vanderbilt University in 2002 as Professor of Biological Sciences, Emeritus. He passed away on May 27, 2016. Dr. Becca Fleischer passed away in 1994.

We are grateful to both of them for their commitment and dedication to our students.
We are grateful to alumni Ira J. Pell ’67 and Eva J. Pell ’68 who generously contributed $100,000 to establish two endowed scholarship funds. The Eva J. Lindauer and Ira J. Pell Scholarship in Biological Sciences provides scholarships to outstanding undergraduate students with financial need majoring in biology who intend to pursue graduate studies in a research university towards a Masters or Ph.D. degree. Named for Ira Pell’s beloved aunt and uncle, the Rose and Max Bresnick Memorial Scholarship provides scholarships to undergraduate students with financial need planning to major in biology. This scholarship could be awarded up to four years to the same student.

Mr. Ira J. Pell graduated from CCNY in 1967. He is a retired Certified Public Accountant. Dr. Eva J. Pell, graduated from CCNY in 1968 with a B.S. degree in Biology. She received her Ph.D. from Rutgers University. Dr. Pell has had an extensive career as a plant pathologist and science administrator. She is known internationally for her research studying the effects of air pollution on vegetation. She served on the faculty in the Department of Plant Pathology at Penn State University for 36 years and also served as Under Secretary for Science at the Smithsonian.

We are grateful to Mr. and Dr. Pell for their generosity and commitment to our students.
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2016 - 2017

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Graduation 2016 - 2017

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The contributions listed below represent gifts made over the past 10 years to the Division of Science. On behalf of our students and faculty, we are deeply grateful for your contributions and partnership.

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