Annual Report
2017-2018

Division of Science

The City College of New York

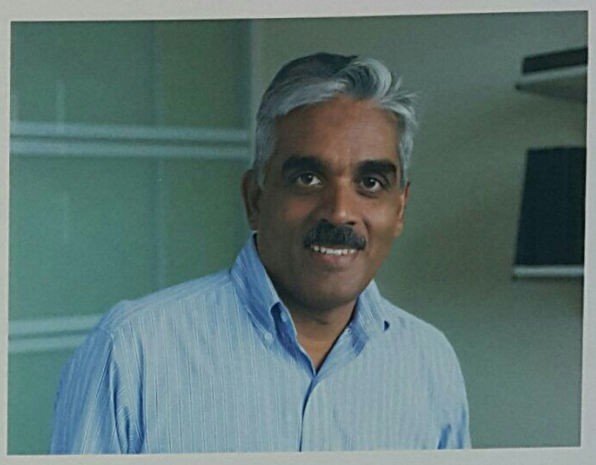
and economically disadvantaged students pursuing STEM and health-related careers. Two of our students were winners this year. Fatimah Uddin, who graduated in May 2018 with a BS/MS in Biology, won for oral presentation; Kirsten Mendieta, who was a premed student and graduated in May, 2018 with a BA in English and a minor in Biology was a winner for the poster presentation, finishing in second place. The Annual Biomedical Research Conference for Minority Students (ABRCMS) brings together over 2,000 students from more than 350 colleges and universities for a four-day conference for poster and oral presentations in twelve STEM disciplines. This year there were six winners from CCNY, three of them, Fatimah Uddin, Mariya Mayer and Courtney Ogando, are from the Division of Science.

Our faculty continue to win research grants and awards in the highly competitive research environment. While there is no room to list all awards here, Dorthe Eisele of Chemistry & Biochemistry deserves special mention for winning the NSF Faculty Early Career Development (NSF CAREER) Award. This is the most prestigious award from NSF, given to the select few who have "the potential to serve as academic role models in research and education". Dorthe's research focuses on the science behind the high efficiency of light-harvesting molecular complexes found in nature, such as in photosynthetic plants. Urs Jans, whose research is in aquatic environmental organic chemistry and himself a winner of NSF CAREER award, was the winner of the Provost's Outstanding Teacher Award, recognizing his disciplinary versatility combined with remarkable instructional excellence. Both the President's Award for Excellence and the President's Award for Outstanding Faculty Service were won this year by faculty from the Division of Science. Mahesh Lakshman from Chemistry & Biochemistry, whose research is on the organic synthesis of molecules of biological interest, won the first of these awards. David Jeruzalmi, also from Chemistry & Biochemistry, won the award for outstanding faculty service.

Congratulations to all student and faculty winners who have done us proud!

The Division of Science has been fortunate in the generous support of its alumni andwell-wishers. This has been very important in our continued pursuit of excellence.This year, as always, we again profile some of our most generous donors. Bernard Levine is a graduate of City College, class of 1950. Dr. Levine has endowed fellowships in the sciences and in mathematics, both for undergraduates and for doctoral students, with donations of $1 million and $5 million. We thank him for his visionary commitment to CCNY.

Distinguished Professor Myriam Sarachik retired this year after a



remarkable career,stretching over fifty years. Her research on the Kondo effect, on metal-insulator transitions and on molecular magnets are considered ground breaking advances.
She won the Oliver Buckley Prize of the American Physical Society (APS), the L'Oreal Prize for Women in Science and was elected President of the APS, only the third woman in its history of more than a century. Sadie Barnes retired after spending thirteen years as secretary in the Earth and Atmospheric Sciences Department. She was the helpful face of the department for both faculty and students.

We wish both Myriam Sarachik and Sadie Barnes a happy and healthy retirement.

City College continues to be the premier institution matching excellence with social and economic upward mobility. In fact, this has been true from its very beginning, long before there was quantitative sociological analysis, before even the word social mobility was invented. In the STEM areas, which are of continually increasing importance, the Division of Science carries this mission forward, in the excellence of our research output, in our high standards of teaching and in the success of our graduates. So, please read on, beyond this brief introduction, and learn more about the remarkable achievements in the Division of Science.

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Dr. V. Parameswaran Nair
Interim Dean of Science
Distinguished Professor of Physics

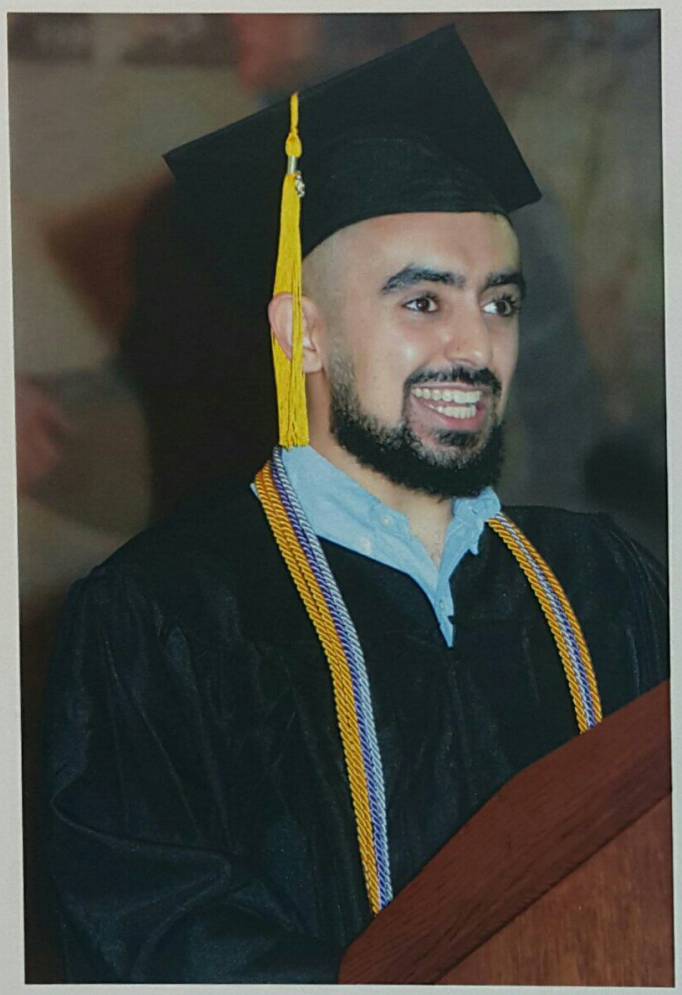
Dr. Laurent Mars
Associate Dean

Dr. Millicent Roth
Deputy Dean for Undergraduate Programs

Dr. Elizabeth Rudolph
Assistant Dean for Graduate Programs & Assessment

Student Achievements

Valedictorian



Nicolas Yehya arrived at CCNY already knowing he wanted to study physics. But the school quickly broadened his horizons in the world of science, for which the 2018 valedictorian is grateful.

"I was interested in physics because it explains the universe with mathematics and physics is also very flexible and can be applied to many problems," he says. "I originally wanted to do particle physics and thought I would be in the standard physics concentration."

Actually, as a child he thought he'd study marine biology-- born in Williamsburg, Brooklyn, he frequently visited family in Puerto Rico and Mexico and spent much of his time in the ocean. But in high school he was "captivated by physics and the idea of being able to explain the world in equations."

But he says his initial views of physics were "naive" and as his interests grew more diverse, the school was ready to offer opportunities and challenge him. "Being at City College as a physics major was great since it allowed my interests to evolve," he says.

In his introductory chemistry class, he found himself intrigued by material science so he instead chose the material science and applied physics concentration. The next step was joining the Eisele Research Group in CDI, which blends physics, chemistry, biology and material science.

"I knew I wanted to do research but I had no idea what that meant in reality," he says, praising Dr. Dorthe Eisele, for her mentoring, helping him not only gain valuable laboratory experience but in learning how to work as a team and learning about the mechanics of academic research. "She gave us a view behind the curtain. She had undergraduate students play an active role in research and even allowed us to participate in the grant proposal process, giving us a view of what it really is like to conduct research in an academic setting. It was great to be able to work on interdisciplinary problems in a chemistry lab, with a professor who had be trained as a physicist."

But as Yehya took electives he again became fascinated by biology, especially by biomaterials and bio-inspired materials. Now, he says, "I am generally interested in the field of biophysics, which is kind of coming full circle."

Yehya was speaking from Johns Hopkins University in the Program in Molecular Biophysics, where he is pursuing a PhD in biophysics, thanks, he says, to the encouragement and advice of his CCNY professors and advisors. He plans on becoming a researcher and professor, with an interdisciplinary focus on the overlap in physics, chemistry and biology. "I hope to make contributions to biophysics that advance the development of medical and renewable and clean energy technologies," he says, adding that he looks forward to being an educator as well.

While he hopes one day to emulate some of his professors in all they taught him, he also credits CCNY's students for helping him fulfill his dreams. "I was able to learn from and teach my peers and we worked together to get through tough classes and finish research projects," he says. "Being at CCNY never felt like an individualistic experience but rather a community working to learn together."

For Dorthe Eisele winning the National Science Foundation Faculty Early Career Development (NSF CAREER) Award serves two purposes: the money will be a great boon for her research while the honor itself highlights the work that women and other underrepresented groups can achieve in the field of physics. Eisele grew up in Germany and earned her PhD in Physics from Humboldt University in her hometown of Berlin. She came to America to work at MIT's Center for Excitonics as a postdoctoral associate.

Nature provided the inspiration for Eisele'research. One of nature's most spectacular molecular architectures is found in the highly efficient solar energy harvesting apparatus of photosynthetic plants and bacteria. While those photosynthetic complexes have been studied extensively, the origin of their high efficiency has remained a mystery. The problem is challenging: The light-harvesting complex not only consists of many individual molecules, its structure is not rigid, and the molecular components are continually moving. The role that this motion plays in facilitating (or impeding) energy transport is unclear.
"Conceptually, my research combines Materials with Physical research approaches and focuses on the fundamental science of self-assembled nanostructures with a particular interest in the complex interplay of the materials structural and optical properties," she says. Her group synthesizes new nanostructures that mimic the interesting features of natural photosynthetic complexes; they then watch the flow of energy through the nanomaterial using super high-resolution microcopy techniques in combination with ultrafast spectroscopy. With this innovative research approach, her goal is to reach a better understanding of how structural fluctuations affect energy transport, which is vital to making essential breakthroughs in the development of efficient photovoltaic devices.

Eisele arrived at CCNY in 2014 as an Assistant Professor in the department of Chemistry and Biochemistry. "When I started here, there was only a small office with a squeaky chair and a desk in the campus old science building," she says. "That was it: just me, myself, and I – all three of us! It was both scary and exciting at the same time." But the research community at City College provided advice and support and by the following year she had opened her lab at the Center for Discovery and Innovation. Over the next two years, Eisele and her team secured significant external funding from NSF ($336,000 Major Research Instrument award in 2015) and from the U.S. Department of Energy ($500,000 from the Solar Photochemistry Program in 2017). "My NSF Career Award as well as my other awards and grants would not have been possible without those many moments where the strong community at CCNY-CUNY helped to overcome obstacles," Eisele says.

Another component of her NSF CAREER award also enables Eisele to promote science beyond traditional academic circles. To increase the interest of underrepresented minority students to pursue careers in the sciences, Eisele's team—in close collaboration with CCNY's The City Tutors—is establishing a STEM community outreach program. That's a fitting program for a professor who has earned a reputation as a dedicated mentor to her students. "CCNY's students have so many hidden talents, I am delighted to be able to join them on their journey to find their interests," she says.

While Eisele relishes solving problems and diving deep into challenging research topics, she says she never forgets that the work, indeed life, is ultimately about people. "It always was and it always will be," she says. " What a beautiful and rewarding way to contribute to our society, through research and through supporting careers of young professionals, who are hungry to learn and eager to find their own career path, who keep me on my toes."