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Dean’s Message
Another busy and productive year in the Division of Science has passed. One of this year’s crowning achievements was the relocation of some of our Science faculty to the new South Campus building, the Center for Discovery and Innovation (CDI). All told, we now have 31 Science faculty labs in CDI, joined by 4 from Sophie Davis (now the CUNY School for Medicine) and 3 from the Grove School of Engineering. The building is a fantastic state-of-the-art facility and we proudly show it off at every opportunity. In fact, we even got to show it to Michele Obama, who was our commencement speaker this year (she was FANTASTIC!). Well, showing it to her is a bit of an exaggeration, but she did hang out in a CDI room downstairs prior to the start of commencement.

The Division of Science welcomed six new faculty this past year: Blair Davey and Jack Hanson in Math, Benjamin Black in Earth and Atmospheric Science, Javad Shabani and Elisa Riedo in Physics, and Amédée des Georges in Chemistry & Biochemistry. Riedo and des Georges were hired through the CUNY Advanced Science Research Center, just east of CDI on the South Campus, but make their academic homes at City College. Each of these new faculty is profiled in these pages.

Professor of Chemistry & Biochemistry Maria Tamargo led a successful proposal for a National Science Foundation CREST (Centers for Research Excellence in Science and Technology) grant. The team was awarded a $5M, 5-year grant to develop and study novel materials while simultaneously increasing minority participation and diversity in materials science. The awarding of this grant is a recognition that Tamargo and her team, which spans both Science and Engineering, are at the forefront of materials science, and a further recognition of the
special role that City College plays in promoting diversity in STEM fields. Read on for more on the CREST grant.

As always, this year saw no shortage of accolades for our faculty and students. Professor Alfano (Physics) was awarded the 2016 Michael Feld Biophotonics award in recognition of his pioneering work in the field. The annual ABRCMS conference saw eight of our undergraduate students come home with poster awards — the most of any college or university at the conference. Kudos to the MARC and RISE Program leaders Jonathan Levitt and Mark Steinberg who guide our students through the process of embarking on research with a faculty member, and to Nkem Stanley Mbanelu who does such a tremendous job preparing the students for the conference. The Division also boasted three Salk award winners, Min Gyu and Joy Patel in Chemistry & Biochemistry and Muhddesa Lakhana in Biology, as well as a Goldwater Scholar, Elliana Schwab, this year. Finally, Daniel Fimiarz (Dean’s Office), Sue Turner (Physics), and Hector Fermin (Biology) all were winners of the President’s STAR award, which recognizes their invaluable contributions to the College.

Deputy Dean Millie Roth’s CSTEP grant was renewed this year, recognizing the excellent work her office does with our incoming, science-oriented, students. CSTEP is a State program, The Collegiate Science and Technology Entry Program, which at City College is one of a suite of programs aimed at bringing students from under-represented groups into STEM fields. CSTEP is specifically focused on economically disadvantaged students who are provided with academic enrichment and research experience in science. Each year there is a CSTEP conference where students from across the State present their research. CCNY always comes away well decorated, and this year we had four award winners, including three first-place awards.

Finally, we are, as ever, grateful to our friends who support the Division of Science in so many ways. We’d like to mention two of our donors in particular who provided support in this past year for new initiatives in Science: The Chleck family and one of our old friends, Dr. Bernard Levine. Dr. Levine has provided funds for a five-year program of PhD fellowships that will enhance our ability to attract excellent PhD students in the sciences. Each fellowship provides a first-year stipend and five years of tuition support for the students. Stipend support for subsequent years is to come from mentor grant funds. President Lisa Coico has graciously agreed to enhance Dr. Levine’s gift with $100,000 per year from the College. The Chleck Family has provided funding for six new undergraduate scholarships. Four of them are four-year scholarships for incoming students, and two of them are two-year scholarships for outstanding juniors in the Division. In addition, they have provided two PhD Fellowships with a first-year stipend and five years of tuition support. Both of these programs are being launched for the first time this year. We are extremely grateful for the support.

We invite you to read further about these and other items in the remainder of this report and share in our collective feeling of accomplishment in what was another banner year for the Division. Thank you for your continued support and interest in our activities.

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
Chapter

1

New Faculty & Staff
Benjamin Black
Assistant Professor
Earth and Atmospheric Sciences

“Right after I arrived, I started teaching, and setting up my lab, and exploring, getting to know people in the department,” Assistant Professor of Earth and Atmospheric Sciences Ben Black says of his move to The City College of New York, “and it’s been great.” “The students were wonderful – really engaged, asked so many great questions; the students really want to learn.” Black comes to CCNY from a postdoctoral position at The University of California – Berkeley. His research has a few main areas of focus: understanding how and why volcanoes erupt, what happens when volcanoes do erupt, and what the consequences might be with respect to climate. Black also works in planetary geology. He is a co-investigator on a NASA proposal that was just funded to study “ancient asteroid bombardment, magmatism, and degassing on Mars” in conjunction with scientists at the Southwest Research Institute in Colorado, in order to investigate implications for Martian habitability. He is also currently a co-principal investigator on an NSF proposal that was funded to “take a multidisciplinary look at links between the Chicxulub impact, the Deccan Traps, a large volcanic province in India, and the mass extinction that killed the dinosaurs, events that all happened about 65 million years ago.” His work is in collaboration with colleagues at UC Berkeley and Drexel University, and it may take him to India. “I’m really proud,” Black says of his position within CCNY, “to be a part of this department and this community.”

Blair Davey
Assistant Professor
Mathematics

Assistant Professor of Mathematics Blair Davey comes to The City College of New York from the University of Minnesota, where she completed her postdoctoral work. She has taught calculus courses at CCNY, and in the upcoming semester she’ll also be teaching partial differential equations (PDE) – “something close to the heart,” she reveals, because that field is where her own research is focused. “The main pull in PDEs is existence and uniqueness of solutions to these equations, and I do work in both of those areas.” PDEs are used to describe a wide variety of scientific phenomena, for example wave propagation and fluid flow. One thing Davey looks at in particular is called unique continuation. “We ask the sort of questions that are beyond uniqueness, that are giving a quantification of uniqueness to solutions,” Davey offers. She also works on looking at the existence of solutions to some complicated equations and at the mathematics of heat flow, for example. “Heat has this phenomenon where it has a direction in time. So heat flows from, say, time equals zero to time equals one. And when you get to time equals one, you don’t necessarily know what was happening at the initial time. This is something about the heat equation that’s very interesting. And if we look at different domains, or different configurations of space, there are different ways that heat will behave in different configurations.” These configurations can be bounded or unbounded domains, and the unbounded domains are where the behavior of solutions becomes complicated. In addition to research projects like these, Davey has been very engaged in teaching. “It’s been a really positive experience in the classroom,” Davey says of her first two semesters teaching at CCNY. “The students are really wonderful.”
Amédée des Georges
Assistant Professor
Chemistry and Biochemistry
CUNY Advanced Science and Research Center (Structural Biology Initiative)

Assistant Professor of Chemistry and Biochemistry Amédée des Georges earned his PhD in Molecular Biology from the University of Cambridge, which he describes as an “extremely collaborative environment.” After finishing his postdoctoral research at Columbia University, des Georges was eager to remain within the kind of institution that would support a free-flow of ideas and research, and he found that sense of community at the CUNY Advanced Science and Research Center and the Department of Chemistry and Biochemistry at The City College of New York. “I’ve been here for nearly a year,” des Georges says, “and I’m super happy to be here.” “The faculty at City is always really engaging.” In addition to the friendly atmosphere, he praises the clear “interest in a mix of different sciences – the nanoscientists are next to the neuroscientists and the structural biologists.” That kind of interdisciplinary mixing, he says, is extremely productive. Des Georges’ own research is focused on the molecular mechanisms of important regulations in the cell. “If I understand how they work,” he explains, “we may be able to find cures to these processes when they cause diseases.” des Georges spent his first year at CCNY setting up his lab and he looks forward to teaching in the Fall 2016 semester.

Jack Hanson
Assistant Professor
Mathematics

“It’s a great department,” Assistant Professor Jack Hanson says of the Mathematics Department at The City College of New York. “I like the students a lot; their attitude is very good. That’s something that’s very refreshing.” Hanson comes to CCNY following postdoctoral work at the Georgia Institute of Technology and Indiana University. “New York feels very much like home to me, so it’s very nice to be here for that reason as well.” Hanson’s research is focused on probability. “I would definitely say in mathematics I’m a probabilist,” he offers, “and I would consider what I do pure mathematics.” “I work on a couple of different models from physics,” Hanson explains. “You could say that a couple of them – they’re different models, but they all fall in the class of percolation (the study of random graphs).” “The big challenges in probability,” he points out, “come from trying to understand the behavior of very correlated random variables.” Some of Hanson’s current projects include work on disordered spin systems, first-passage percolation, a method used to study the set of paths possible in a random medium in a fixed period of time, and issues related to random walks on critical percolation clusters.
Elisa Riedo  
Professor  
Physics  
CUNY Advanced Science and Research Center  
(Nanoscience Initiative)

Professor of Physics and a member of the Advanced Science and Research Center’s Nanoscience Initiative, Elisa Riedo comes to The City College of New York from the Georgia Institute of Technology. She obtained her doctorate in Physics from the University of Milan and completed postdoctoral work at the Ecole Polytechnic Federale de Lausanne in Switzerland.

“I love my new colleagues,” Riedo says. “There is a sense of change that I’m feeling.” Like other faculty members, she appreciates the idea of interdisciplinary research that defines the Division of Science, City College and CUNY. “That’s really something everybody’s pushing for, and I can see that little by little the outside world is looking towards us now – because we have, every day, people who want to come and visit from industry, government, and all over.” Much of the funding for Riedo’s research in nano-mechanics, in fact, comes from the Department of Energy. Riedo’s research, the methodology of which is based on atomic force microscopy, focuses on nanotechnology, “on the ability to fabricate material at the nano-scale with new functionality – and this new functionality can have different types of applications: biomedical applications, or mechanical devices, or for example electronic devices. What we do in our lab is develop new methods, new experimental techniques, to manipulate molecules and matter at very tiny scales, such that the material – the new nano-system – has particular functionality.” Riedo recently received a grant to study water filtration and the behavior of water in nano-pores and nano-geometry.

Javad Shabani  
Assistant Professor  
Physics

Talking about his research interests in quantum computation, Assistant Professor of Physics Javad Shabani refers back to his early days in graduate school: “I was at Princeton, and we were doing material-oriented research with fundamental physics,” he says. “You look at the low-temperature transport of various materials, and these are the electrons trapped in two dimensions.” Shabani explains that “it turned out if you apply a huge magnetic field, fourteen tesla or above, these electrons will start dancing around in particular ways,” but “at the end of the Princeton research it looked too abstract, electrons are dancing and that’s really cool, but then what are the real-life applications?” Postdoctoral work at Harvard and then The University of California – Santa Barbara helped him find the answer to that question, and Shabani brings a deep interest in material physics to The City College of New York. His lab at the Center for Discovery and Innovation is staffed by CCNY students, and he admits that “what we do in the lab requires a lot of time and focus.” “What I see in the students is that everybody has a story.” The students, he praises, “put so much time into their work, it’s unbelievable.”
Ana Guerrero has worked within the CUNY system since 2001, moving from Hunter College to The City College of New York at the start of the Fall 2015 semester. She made the move to be closer to home, and has found a real sense of community in the Chemistry and Biochemistry department here. “It’s nice to get back to the students,” Guerrero says. Though she manages many administrative responsibilities – she works on the department’s budget, website, and helps faculty with problems and questions they may have – she loves student interactions. “I was a student,” Guerrero says, and that makes her want to “jump in and say ‘let me help you.’” If she doesn’t know the answer already, Guerrero will go far out of her way to find the best approach to solving a student’s problem. “I’m here for the students.” Of the department as a whole, Guerrero very happily says, “I feel very welcome.”

Janey Ozoria comes to The City College of New York from the Columbia University Medical Center, where she worked in the development office for more than eleven years. Ozoria started at CCNY in February of 2016. “I love it,” she says. “I get to know students, work with faculty members, work with Dean Tony Liss, who’s great – everyone’s been very welcoming, and it’s a good experience.” Ozoria and the Division of Science just launched a divisional e-newsletter called “The Element”, and with Ozoria’s help the Division also launched a senior class gift campaign for the Class of 2016, in order to encourage students and alumni to give back to the Division of Science. Ozoria spends a lot of time getting in touch with donors and alumni, in efforts to continue gathering support for the Division’s many projects and students. “Everyone’s pretty open to new suggestions,” she points out, “and they collaborate a lot.” “I’m here,” Ozoria says, “to help the Division of Science, and I want them to know that.”
Faculty, Staff & Student Awards
Now in its sixteenth year, The Annual Biomedical Research Conference for Minority Students (ABRCMS) is one of the largest, professional conferences for underrepresented minority students, military veterans, and persons with disabilities to pursue advanced training in science, technology, engineering and mathematics (STEM). All are pursuing advanced STEM training and many have conducted independent research. At last year’s conference held in Seattle, Washington over 4080 people were in attendance comprised of about 2089 undergraduate and post baccalaureate students and 443 graduate students. 31 CCNY Division of Science undergraduate students attended and presented their research projects. All undergraduate student presentations were judged and those receiving the highest scores in each scientific discipline and in each educational level were recognized at the final banquet. CCNY had an impressive showing in the awards category. Eight students won awards, three from Biology, two from Biomedical Engineering, and three from the Sophie Davis Program. This was a new record for CCNY. Award winners pictured left to right: Christina Torres, Biology; Hazeezat Shittu, Sophie Davis; Zhiying Zhu, BME; Electra Nassis, BME; Ms. Nkem Stanley-Mbamelu, CCAPP Assoc. Director; Christopher Reid, Biology; Shirley Mo, Sophie Davis; Melissa S. Evelyn, Sophie Davis; and Rachael Hernandez, Biology.
Every year the Collegiate Science and Technology Entry Program (CSTEP) host a student conference highlighting undergraduate student research at The Sagamore Hotel on Lake George in Bolton Landing, NY. At this year’s 24th Annual CSTEP Conference our CCNY CSTEP program known as City College Academy for Professional Preparation (CCAPP) was well represented. Nearly 550 undergraduate students from over 40 college/universities in New York State attended the conference. Eight CCAPP students attended and participated in the research competition at this year’s conference.

The Division of Science is proud to report four of the eight CCAPP students placed for an award. Trinisia Fortune, a Biology major won first place in the Natural Science Division Oral Presentation section. Shavanie Prashad, a Biochemistry major was awarded an honorable mention in the oral presentation competition also in the Natural Science Division. Marisol Cortes, a Biochemistry major and Candice Forrester, an aspiring biology major won first prizes in the Medical, Health and Wellness and Engineering/Math & Science sections respectively.

The Division of Science is proud of all competitors and winners!
The City College of New York is the recipient of four of the eight Jonas E. Salk Scholarship awarded by The City University of New York this year. The scholarships recognize exceptional students who plan careers in medicine and the biological sciences. Three of the four winners were from the Division of Science.

As Salk Scholars, Alex Bonilla, Muhddesa Lakhana, Min Gyu Noh and Joy Patel will each receive a stipend of $8,000 to be appropriated over three or four years of medical studies. Lakhana, who resides in Elmhurst, Queens, received her bachelors degree in biology from the Macaulay Honors College. She entered the New York Institute of Technology College of Osteopathic Medicine this fall. Gyu Noh earned a BS in chemistry last year and is enrolled at SUNY Downstate Medical Center. Patel completed his undergraduate degree in biochemistry. He too has enrolled this fall at the New York Institute of Technology College of Osteopathic Medicine.

The scholarship is named for Dr. Jonas Salk, a 1934 graduate of City College, who developed the first polio vaccine in 1955. Dr. Salk turned down a tickertape parade in honor of his discovery, and asked that the money be used for scholarships instead. New York City provided initial funding for the scholarships that year.
Ellianna Schwab, a recipient of this year’s Barry M. Goldwater Scholarship, is currently a student in the Division of Science at The City College of New York, majoring in physics.

The Goldwater scholarship was established by the United States Congress in 1986, in honor of Senator Barry Goldwater. Its purpose is to “provide a continued source of highly qualified scientists, mathematicians, and engineers by awarding scholarships to college students who intend to pursue research careers in these fields.”

Schwab’s own goal is to go on to earn her PhD in mathematical astrophysics, which will allow her to pursue a career in academics, conducting independent research, running interdisciplinary research teams, and teaching at the university level. Her specific area of focus involves the magnetic signatures of black holes (which have magnetic fields observable just outside their event horizons) and nearby accretion disk plasma.
Henry Wong, a physics major at The City College of New York, is one of this year's recipients of the Bernard Levine Scholarship. He has worked in the lab of Professor Carlos Meriles, focusing on NMR spectroscopy. “You could say this is fundamental research, because we’re understanding the fundamentals of NMR, and some other techniques to improve the NMR. So my research is experimental,” Wong explains. As someone who wants to go on to pursue a graduate degree in physics so that he can go into research and a career in academia, Wong is also interested in theoretical research. “I intend to expand my field into other areas,” he says of his continuing studies.

Biology major Zubi Razzak is another recipient of this year's Bernard Levine Scholarship. He has worked in the lab of Professor Shubha Govind, where his research focuses on “Drosophila and parasitic wasps, and the host-parasite interaction between the two species. What I’m working on right now,” he explains, “is what the Drosophila use as a line of defense against foreign pathogens and bacteria, so I’m looking at something called hematopoiesis, which is the formation of these specialized blood cells.” Razzak wants to pursue minors in history and chemistry as well as continue his studies in biology. “When I came in,” he says of his time at City College, “I started in biology from the beginning, because I was interested in going into research, going to graduate school. Right now, my focus has kind of shifted towards going to medical school,” Razzak says of his plans after he graduates from CCNY.

Zunxu Tian, a biology major at The City College of New York, is the third of this year's recipients of the Bernard Levine Scholarship. He works in the lab of Professor Jonathan Levitt, which focuses on understanding the physiological properties and anatomical connections of neurons in the mammalian cerebral cortex (an area of the brain) associated with visual perception. The lab employs both electrophysiological studies and neuroanatomical techniques; Tian is “interested, passionate, and dedicated to both his studies and neuroscience research,” while also finding time to volunteer with an emergency medical technician service and work with the City College Academy for Professional Preparation. Tian has a fascinating life story. In China, because his family was so poor, as a small child, Zunxu was enrolled in acrobat school. When he mastered his art, he performed to help support his family. He came to the United States as a performer, first appearing in Texas. Zunxu visited New York City and fell in love with the excitement and culture. He enrolled at Laguardia Community College where he mastered English. It was there he developed his appreciation for a career in medicine and continues these pursuits at CCNY.

The Bernard B. Levine Scholarships in Science and Mathematics have been made possible by a generous commitment from Dr. Bernard Levine, class of 1950, who established an endowment to provide permanent scholarship support to high-achieving juniors and seniors in the Division of Science at CCNY. Students must be highly recommended by a faculty member in order to be considered for this award.
Karen Hubbard, Professor of Biology, is the recipient of this year’s President’s Award for Outstanding Faculty Service for the Division of Science. The award is presented annually to one faculty member from each School, Division, the Library, and SEEK, whose outstanding service improves the City College of New York and its community. Hubbard, who is also the Collaborative Director of the CCNY-Memorial Sloan-Kettering Cancer Center Partnership Collaboration and whose research interests focus on gene expression during cellular aging, has been at The City College of New York for twenty years, and she’s been an active faculty member from the very beginning. Hubbard herself says it best: “one of the things that I’ve always been very passionate about is helping our students, but also I’ve been very interested in and committed to faculty development.” Hubbard began working on a partnership with Sloan-Kettering, and was the original City College faculty member involved with the development of MSKCC-CUNY partnership. Since then the program has expanded, bringing in other people to help administer the program, but Hubbard still serves as director. She also sits on a committee for CUNY faculty affairs and development. Through her various programs, committees, and research groups, Hubbard is active not only in the CCNY and CUNY communities, but also in the greater national scientific communities as well. “I have a sense of community,” Hubbard says, “and I want to always give back to the community, whatever community that is.”
Robert Alfano, Distinguished Professor of Physics, is this year’s recipient of the Optical Society of America’s Michael S. Feld Biophotonics Award. The award recognizes individuals for their innovative and influential contributions to the field of biophotonics. The Optical Society of America cites Alfano’s “leadership and pioneering contributions to the field of biophotonics, comprising the diverse use of label-free native fluorescence, Raman spectroscopy, and optical imaging for cancer detection in tissues and cells” among their reasons for their selection. “During these years,” Alfano says of his long and decorated career, “I changed over from conducting basic studies in the molecular world of physics to investigating biomedical effects, such as cancer, using light.” These investigations drive his research in biomedical optics. He holds 114 patents, one of which was recently awarded (No. 20160128775A1) for his method of using supercontinuum light for medical and biological applications. Alfano has raised $64 million in photonics research funding, and has mentored 56 PhD students at City College since 1972, when he began working at The City College of New York.
Daniel Fimiarz, Research Facilities Manager for the Division of Science, is one of this year’s recipients of the President’s S.T.A.R. Award – an award given to exceptional City College staff who demonstrate outstanding Service, Teamwork, Action, and Results. Fimiarz started his career at City College by managing a microscopy lab, and after two years was moved into a position where he could manage Divisional facilities on a larger scale. In this capacity, Fimiarz has developed a system for submitting and evaluating the effectiveness of work orders across the Division of Science, in efforts to more thoroughly engage Divisional faculty and staff. “My role is to develop computer-based tools to improve communication and management here in the Division.” Fimiarz’s projects also directly impact students, for example, he manages the system students use to reserve time on microscopes and other instruments in the Divisional Core Facilities. “One thing that I love about working here is that my job assignments are always interesting and varied. My computer and IT skills can really shine and make a big difference. You know – working somewhere else, you’re a drop in a bucket of many, many different people who do similar things. But here, my skills can definitely be applied to improving – whether it’s managing a community or the communication between people. So I’m happy with that.” Fimiarz talks about how rewarding it is to be able to really see the impact he’s making on the Division. “There are always,” he says, “new things happening here.”

Sue Turner, Higher Education Officer Assistant and Department Administrator for the Physics Department at The City College of New York, is another of this year’s recipients of the President’s S.T.A.R. Award. Turner has worked in the Physics Department in the Division of Science since 1988, and is an invaluable resource there. Alexios Polychronakos, Chair (at the time) and Professor of Physics, writes in his nomination letter of Turner that “her service and contributions are of such caliber and oversized importance that we cannot
even fathom how this department would operate, or survive, without her.” “I love it,” Turner says of her time in the Physics Department. “I like the variety of people – we get the high school students coming in; we get guest speakers from all over the world; we have such a wonderful faculty.” Turner’s nomination letter was supplemented by notes from various faculty members – and even students. “The support was just so overwhelming,” she says. The department feels the same way. Since Turner has worked there, the number of students majoring in Physics has gone from five to about seventy. Turner has facilitated the founding and operation of The Physics Club, which has become registered as a part of The Society of Physics Students, a national branch of the American Physical Society. The S.T.A.R. Award comes with a two-thousand-dollar prize from the President’s Office. “I used that money,” Turner explains, “to set up an account with The City College Fund for physics student travel. We already have one or two professors who also want to contribute.”

Biology Department Senior College Laboratory Technician (CLT) Hector Fermin is the third recipient of this year’s President’s S.T.A.R. Award from the Division of Science. He is responsible primarily for Biotechnology labs and classes. “My job is to prepare the lab, make sure everything is right.” He works with teaching assistants (who are PhD students), professors, and students alike. “I’ve been working here for so many years,” Fermin notes. “I graduated from the Biology Department of City College.” He says being in the lab with students helps him keep his own research skillset sharp. “I really love the students. That’s why I’m here,” Fermin explains. “Every time that I work with students, I make sure to encourage them to do their best.” Having been a student at The City College of New York, Fermin knows that sometimes students need to hear that somebody believes in them. At the start of the Fall 2016 semester, Fermin will be named Chief CLT, which will make him responsible for the supervision of all teaching labs and equipment orders for the Biology Department.
Awarded $5 Million Grant from NSF CREST

Maria Tamargo, Professor of Chemistry and Biochemistry at The City College of New York, has been awarded a $5 million grant along with colleagues to establish the Center for Interface Design and Engineered Assembly of Low-Dimensional Systems (IDEALS). The Center’s goal is to “design and discover materials with new and enhanced functionalities to further technology, energy, and health applications.” The IDEALS Center aims to concentrate on the need for “accelerating the pace of discovery and deployment of advanced materials to address critical needs and grant challenges.” Another of the Center’s goals is focused on the students it will work with, in active efforts to “recruit and retain students from underrepresented groups in order to produce a diverse workforce of materials science and engineering leaders trained for careers in academia or industry, including high-tech manufacturing jobs.” Tamargo herself, who is Cuban-born, has long been devoted to increasing minority representation in the field of materials science. Her research interests are centered on materials growth and the properties of semiconductor multi-layered structures grown by several methods, particularly Molecular Beam Epitaxy (MBE). More information on the NSF CREST grant is available at http://www.nsf.gov/awardsearch/showAward?AWD_ID=1547830.
Associate Professor of Earth & Atmospheric Sciences Maria Tzortziou participated in a joint field campaign between NASA and KIOST (Korea Institute of Ocean Science and Technology) this summer. The campaign, called KORUS: An International Cooperative Air Quality Field Study in Korea, brought together researchers and scientists across disciplines and institutions to examine both atmospheric and ocean conditions and processes. Located above the region in question, which includes South Korea, the East Sea, and the Yellow Sea, is “the only satellite sensor that currently provides ocean color observations from a geostationary orbit,” explains Tzortziou. This is one of the reasons the campaign took place there. “All of the sensors that we currently have to study the ocean with at NASA,” Tzortziou continues, “are in a polar orbit, meaning that they go around the earth and we can only have observations over Chesapeake Bay, or the coastal water in New York, every one or two days. If we had a satellite sensor in a geostationary orbit, we would be able to look over the US continuously.” NASA’s participation in the KORUS campaign serves in part to set the stage for the development of such geostationary sensors, which Tzortziou says is a very exciting development. The campaign involved two ships, one used primarily in shallow waters and another, larger vessel used in deeper waters. “Our contribution to this field campaign,” Tzortziou says, “was to study the atmosphere over the ocean. There are very few measurements of what’s happening in the atmosphere over the ocean because typically sensors that measure atmospheric properties are ground based sensors, and they measure what’s happening over the land, but there are very few opportunities to operate these sensors on ships or on platforms over the water.” The team used a new sensor they developed in collaboration with NASA, called the Pandora Sensor, “one of the first sensors that can measure atmospheric trace gases” from shipboard, “specifically designed so that it can operate on a moving platform.” Tzortziou explains the impact of this new sensor: “with this campaign, we have some of the first data sets of trace atmospheric gases over coastal waters.” More information on this campaign, photos from the boat, and information on other projects from Tzortziou’s lab are available at http://www.mariatzortziou.com/.
Chapter 4

Research, Discovery and Recognition Milestones
The migration of our research laboratories from the Marshak Science building was completed during the Fall 2015 semester – the last lab was moved on December 29! In all, 32 labs, tons of research equipment, and close to 300 people were moved over a nine-month period. CDI occupants have been slowly acquainting themselves with the idiosyncrasies of their beautiful new home; the open space concept of the building is facilitating collaborations among faculty and the public spaces on each floor (called tea rooms) have rapidly become the favorite hangouts of our research staff and students.

We are also making small improvements to this already technologically advanced structure: one of the energy saving features of the building, a sophisticated window shades control system, was further enhanced to enable researchers to remotely adjust the setting of their own shades from a PC or smartphone;

The CDI surroundings are just as impressive as the building itself and have become the focal point of many social activities, including two highly successful commencement ceremonies.
The Division in Numbers
2015 Science Division Graduates

38 Graduated Students entered the following Medical Schools

Albert Einstein College of Medicine
Cooper Medical School of Rowan University
Drexel University College of Medicine
Frank H. Netter, MD School of Medicine at Quinnipiac University
Harvard Medical School
Icahn School of Medicine at Mt. Sinai
Lake Erie College of Osteopathic Medicine
New England College of Optometry
New York University College of Dentistry
Nova Southeastern University College of Osteopathic Medicine
NYIT College of Osteopathic Medicine
Perelman School of Medicine at the University of Pennsylvania
Rowan University School of Osteopathic Medicine
Rush Medical College
Stony Brook University School of Dental Medicine
Stony Brook University School of Medicine
Stritch School of Medicine/Loyola University Chicago
SUNY College of Optometry
SUNY Downstate College of Medicine
SUNY Upstate College of Medicine
Touro College of Osteopathic Medicine
Tufts University School of Dental Medicine
UC Davis School of Medicine
University at Buffalo School of Dental Medicine
University of Pennsylvania School of Dental Medicine
University of Pennsylvania School of Veterinary Medicine

Undergraduate Enrollment Trends 2009-2015 - fall semester snapshots

<table>
<thead>
<tr>
<th>Year</th>
<th>Undergraduate</th>
<th>Masters</th>
<th>PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>613</td>
<td>1142</td>
<td>78</td>
</tr>
<tr>
<td>2010</td>
<td>621</td>
<td>1031</td>
<td>9</td>
</tr>
<tr>
<td>2011</td>
<td>687</td>
<td>1278</td>
<td>8</td>
</tr>
<tr>
<td>2012</td>
<td>745</td>
<td>1236</td>
<td>15</td>
</tr>
<tr>
<td>2013</td>
<td>798</td>
<td>1188</td>
<td>2</td>
</tr>
<tr>
<td>2014</td>
<td>860</td>
<td>1037</td>
<td>2</td>
</tr>
<tr>
<td>2015</td>
<td>913</td>
<td>1076</td>
<td>2</td>
</tr>
</tbody>
</table>

Post Graduate Statistics 2016

38 Graduated Students entered the following Medical Schools
Hours for Shared Research Equipment

Total Hours: 18,510

<table>
<thead>
<tr>
<th>Equipment Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zeiss LSM 510 • Zeiss LSM 710 • Ultima 4 Two Photon MS</td>
</tr>
<tr>
<td>MonoVista CRS-Upright SP 2750</td>
</tr>
<tr>
<td>Jeol TEM • Zeiss Supra 55 SEM • Zeiss EM 902 TEM</td>
</tr>
<tr>
<td>300 MHz Varian Mercury • 500 MHz Varian Unity-Inova</td>
</tr>
<tr>
<td>• 600 MHz Varian Unity-Inova for Liquids, with Cryo-probe</td>
</tr>
<tr>
<td>• 600 MHz Varian NMR for Solids and Liquids</td>
</tr>
<tr>
<td>Lithography • Evaporation/Sputtering Deposition</td>
</tr>
<tr>
<td>4000 Q TRAP™ LC/MS/MS System; Waters TOF MS</td>
</tr>
<tr>
<td>PANalytical X’Pert PRO • Bruker XRD D8 Discover</td>
</tr>
</tbody>
</table>
Chapter

6

Spotlight on CCNY Supporters
Chleck Family Scholarship & Graduate Research Fellowship in Science

The Chleck Family Foundation has made an impactful and generous gift to The City College of New York’s Division of Science in order to create the Chleck Family Scholarship & Graduate Research Fellowship in Science. The gift is made in honor of chemist, entrepreneur, and City College alumnus David Chleck (‘48). Ross Levine, executive director of the foundation and Levine’s grandson, cites a desire to honor his grandfather’s City College experience and help continue the access to higher education and opportunity that is so central to CCNY’s mission. “We wanted to make a gift that would have a real impact with young students and the college as well,” says Levine. The fund will support both undergraduate and graduate students studying in the Division of Science and majoring in Biology, Chemistry, Earth and Atmospheric Sciences, Mathematics, and/or Physics who demonstrate financial need, and will certainly allow the Division to continue to distinguish itself as a research program.

Ross Levine and the Chleck family

John S. Arents Emergency Fund

Gabriele Arents, widow of the late Professor John S. Arents, has established the John S. Arents Emergency Fund, to be used by the Department of Chemistry in the Division of Science at The City College of New York. The two were married for fifty years and Gabriele Arents is creating the Fund at the bequest of her late husband, who served as Chair of the Department of Chemistry during his time at City College. Its purpose will be to provide emergency grants to students who are in good academic standing but are struggling with short-term financial emergencies so that they will be able to remain in school rather than be forced into taking a leave of absence or into dropping out of the College entirely. Gabriele Arents, in founding the John S. Arents Emergency Fund, continues a long legacy of wide-reaching and inclusive access to opportunity and education at The City College of New York, and honors the late Professor Arents’ dedication to teaching and to his students.
This year, Dr. Gerald S. Brenner ('56) has generously supplemented his support of the Division of Science at The City College of New York by increasing his gift to the Gerald S. Brenner Endowed Scholarship Fund, so that two full scholarships may be awarded to students annually. Dr. Brenner first established the Fund in 2004 in commemoration of the 45th anniversary of his graduation from City College, as well as in celebration of his 70th birthday. The purpose of The Gerald S. Brenner Endowed Scholarship Fund is to provide scholarships in the Division of Science for students who demonstrate financial need, “strong potential,” and a strong level of academic achievement. The Fund also requires that candidate exhibit a deep “interest in charitable giving or community service,” for example, the desire to help fellow students. Dr. Brenner has a Bachelor of Science in Chemistry from City College, and has worked as a pharmaceutical consultant with a focus on preclinical chemistry and formulation development within the pharmaceutical industry. He also works in the analysis of intellectual property, patent defense, and has served as an expert witness. Dr. Brenner was Senior Director of Pharmaceutical Research and Development at Merck Pharmaceuticals, where he worked from 1961 to 1994.
Learn More About Our Programs At
https://www.ccny.cuny.edu/science

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