

NYBG

GARDEN NEWS
FALL 2017-WINTER 2018

NEW YORK BOTANICAL GARDEN



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Dear Friends:

For those of you who are not yet aware, I have announced that after 29 years at the helm of The New York Botanical Garden, I will be stepping aside on June 30, 2018. I am not only very proud of what we have accomplished here over the course of the past three decades, but also very confident of the continued success of this venerable institution in the future. I hope I will have many occasions to see you to thank you for your ongoing patronage and support.

By visiting, attending special events, volunteering, becoming a Member or Patron, and donating, your participation helps NYBG contribute to the quality of life in New York City and raise global awareness and understanding of the importance and wonders of the plant world.

NYBG is fundamentally an education institution, with informal and formal programs in unique learning facilities—both indoors and outdoors—for students from pre-K through college. Hands-on, inquiry-based offerings are at the core of our mission, encouraging excitement of scientific thinking and investigation as well as engagement in protecting the environment.

This issue highlights many of the innovative programs that make NYBG a leader and national model in this critical endeavor, especially in underserved communities, in training the next generation of Earth's caretakers.

The spectacular vistas across the grounds have transitioned to their autumnal glory, which will be followed by striking silhouettes of towering evergreens and majestic pines in the winter landscape that will usher in the annual *Holiday Train Show*[®], now in its 26th year.

All of the exciting exhibition and programming details of our fall and winter offerings can be found at nybg.org in order to plan your upcoming visits!

Gregory Long
Chief Executive Officer
The William C. Steere Sr. President

NYBG's Pathway and Youth Programs Inspire Careers in Science and Education

By James S. Boyer, Ph.D., Stavros Niarchos Foundation Vice President for Children's Education, and Barbara A. Ambrose, Ph.D., Director of Laboratory Research and Associate Curator of Plant Genomics



NYBG programs provide hands-on experiences that inspire and engage Bronx youth in a wide variety of scientific exploration and discovery.

While it is widely known that The New York Botanical Garden educates more than 85,000 schoolchildren and trains 3,200 science teachers each year, it is less well-known—though equally important—that through a constellation of experiences, NYBG also mentors and inspires more than 4,000 youth to explore and pursue careers in science, education, and related STEM fields.

We are committed to supporting and strengthening the Bronx community. More than half of school groups attending programs at NYBG come from the Bronx, and 83% of all school groups are from Title I schools. In the borough, college readiness rates among minority students in the lowest income neighborhoods is 10%. Only 57% of Bronx high school students graduate within four years compared to 65% of students citywide. As a major educational anchor in the borough, NYBG is in a position to provide educational experiences and opportunities to students who may not otherwise have access to them through both formal and informal programs. NYBG is a partner and resource to many community-led education organizations and, together, we are working to provide pathways to STEM careers for urban Bronx youth.

We are also committed to supporting and strengthening the pathway for STEM professionals. In plant science, as in many professional fields, there is a lack of diversity in the workforce. NYBG, being located in Bronx, is well positioned to

provide STEM training and career preparation for populations that are typically underrepresented in the Sciences. Science and technology innovation is the backbone of the United States economy and is the result of creative thinking. Scientific innovation, in plant sciences as in all scientific fields, will be strengthened by incorporating a more diverse workforce. Science and technology careers will remain a stable and financially sound career choice and should be made available to all.

Our Pathway and Youth Programs provide a great opportunity for us to recruit people from the Bronx community into STEM fields by eliminating barriers that prevent low-income and underrepresented students from pursuing opportunities in science. We could maximize our impact by providing paid internships in the Science Internship Program; providing opportunities for students from the Bronx to pursue post-graduate degrees in plant science in the Graduate Studies Program through dedicated fellowships and established partnerships with CUNY and other affiliated universities; and developing a diverse network of role models in the plant science field that commit to serving as mentors to both Interns and Graduate Students.

Many of NYBG's efforts to inspire and engage Bronx youth in pursuit of careers in science and education are featured on the following pages.

Middle School GEAR UP Institute

By Tai Montanarella, Marian S. Heiskell Associate Director of School and Out-of-School Programs

What does the study of epidemiology have to do with a botanical garden? More than many might realize. Epidemiology is the study of health in populations to understand the causes and patterns of health and illness. As part of a month-long course about this science at Fordham University, Bronx middle school students discovered practical ways plants and exploration entwine to affect a significant population of the Bronx during a week-long institute, *Plants, Exploration, and Human Well-Being*, hosted by NYBG's GreenSchool.

Under the guidance of Garden professionals from the Institute of Economic Botany, Thain Family Forest, and Children's Education, students from Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP), a college readiness initiative, had the opportunity to contextualize their classroom studies and find those connections between plants and epidemiology for themselves in the field.

Their fieldwork began as they identified and described useful plants in the Enid A. Haupt Conservatory and generated their own questions about each specimen. Information about some of the ways plants such as soursop (*Annona muricata*) and *Aloe vera* were useful to humans were already familiar to many of the students who eagerly offered stories about how and when their families use them at home. Their experiences sharing their cultural plant knowledge with peers about plant remedies was the gateway for Ina Vandebroek, Ph.D., Matthew Calbraith Perry Assistant Curator of Economic Botany and Director of the Caribbean Program at NYBG's Institute of Economic Botany (IEB), to introduce her work as an ethnobotanist.

Dr. Vandebroek studies traditional medicinal plant use by Dominican and other Caribbean communities in response to the chronic health conditions found in the Bronx such as diabetes, hypertension, asthma, and cholesterol. Students learned how her work helps modern healthcare providers ask questions of their patients about potential plant remedy use in order to have a more complete understanding about their patients' well-being.

Finding and describing plants essential to human health continued during a visit to the Garden's farmers market where students learned from both the market manager, Sarah Marcisak, and the farmers themselves about the benefits of local agriculture and access to fresh and nutritious food. Having never shopped at a farmers market, students enthusiastically tasted plant parts familiar (raspberries) and exotic (red cabbage) and chose some to bring back to the GreenSchool to experiment with isolating parts containing useful plant metabolites such as pigments for making dyes.

By the third day, students persisted in their exploration during a week-long heat wave, as they became Citizen Scientists under the tutelage of Jessica Arcate Shuler, Director of the Thain Family Forest, and her team. During



NYBG Ethnobotanist Brian Hockaday leads Middle School GEAR UP participants on a visit to a local *botanica*.

a Lower Hudson Partnership for Regional Invasive Species Management (PRISM) Blockbuster Training, teens familiarized themselves with observable features of invasive plant species threatening biodiversity in our forest and then went out into the field to survey, record data, and ultimately remove them.

When thinking about why biodiversity of plants might be important to human health and well-being, students easily made the connections about how invasive species are not only exposing humans to diseases such as Zika virus, but also outcompeting native plants making it difficult for them to grow and threatening native animals and humans access to food, clean air, and drinkable water.

Students' exploration of plants and human well-being concluded with a visit to a local *botanica*. There, Brian Hockaday, Ethnobotanist and Research Assistant to Dr. Vandebroek, shared information about his interests in finding the interplay between plants and people for the greater purpose of healing, wellness, and care for personhood. He encouraged students to find plants that correlate with *their* worlds and to think about how buying those items at a *botanica* instead of a traditional grocery store might be special. He explained how the IEB researches the active role community members take in their healthcare and leads awareness classes for doctors on the topic.

When posed to students at the beginning of *Plants, Exploration, and Human Well-Being*, "What does epidemiology have to do with a botanical garden?" one student had responded, "That's what I was wondering!" When posed again on the concluding day, his answer was simple, "Everything."

Explainer Program Profile

By Patricia Hulse, Director of the Everett Children's Adventure Garden

Since 2001 the Everett Children's Adventure Garden's Explainer Program has been a gateway for local New York City youth to learn basic job skills, explore career opportunities, and spend time outdoors exploring the environment. Veniece Pinnock joined the Explainer Program in January 2013 as a volunteer. She has worked her way up to greater levels of responsibility and taken on various roles. Her story of growth and career exploration through her work as an Explainer embodies the ethos of the Program.

Why did you join the Explainer Program? I was a sophomore at the Bronx Center for Science and Mathematics in the South Bronx. Our school required 100 hours of community service to graduate. I knew I wanted to volunteer in a place that was outdoors. I asked my advisor about internship opportunities, and he suggested applying to the NYBG Explainer Program.

What happened next? I filled out an online application and was invited to participate in a group interview. I was really, really shy and introverted then. All of the other applicants were speaking up to get noticed but I was very quiet during the presentations. I didn't think I would get selected but the Program staff must have seen something in me because I was chosen to become an Intern Explainer!

How was the required 125-hour Internship? I was new to botany. It was an amazing work environment. Everyone was open and accepting of each other. The group wanted to learn and teach others. We were building so many new skills. When I first started, visitors couldn't understand me because I spoke so quietly at activity stations. The Senior Explainers really mentored me and helped me break out of my shell. They encouraged me to speak up and out so that visitors could hear me.

What happened next? I finished my required hours and then all summer my parents drove me every day from Harlem to continue volunteering at the Garden. They saw the growth and change in me since joining the Program. In fall 2013, I applied to and was selected to fill one of three paid Master Explainer positions that were open. This was such a fantastic first job! We had the opportunity to learn and improve our job performance with the support and guidance of the Senior Explainers and staff.

What was your journey like during senior year to select a college and major? I really wanted a career that was outdoors and hands-on. I thought the horticulturist at the Adventure Garden had the best job ever! My parents expected me to go into medicine or law as a career. My family is from Jamaica; we moved to New York City when I was in fourth grade to give my

younger brother and me educational opportunities that they didn't get. As a result of that exposure, I wanted to see what other career options were available. Through my contacts in the Adventure Garden, I explored the many exciting aspects of a career in science education. For example, I went on a MetroHort tour of a garden in Manhattan with School of Professional Horticulture Director Charles Yurgalevitch. I talked to a graduate student in the Pfizer Lab. I met with Ursula Chanse, Director of Bronx Green-Up, and Jessica Arcate Shuler, Director of the Thain Family Forest. So when I entered Hunter College, I already had an idea to major in Environmental Science.

How have things changed after two years at Hunter College? My first year I took general liberal arts courses and was undeclared. My parents hadn't given up on medicine. I tried really hard in my chemistry and math classes in the fall of sophomore year, but I had no passion for the subjects and didn't do well at all. My college advisor asked me point blank, "What are you good at?" I didn't hesitate—"I'm really good at my job as an Explainer. I love teaching." My advisor told me to go for it!



NYBG Senior Explainer Veniece Pinnock in the Everett Children's Adventure Garden

And now you are an education major at Hunter and a Senior Explainer in the Everett Children's Adventure Garden. I am pursuing an undergraduate degree in Developmental Psychology. I think right now that I will get a Master's Degree in Early Childhood Education, which certifies me to teach through second grade. I am a Senior Explainer but was also a Camp Explainer this past summer. I get to see first-hand what is involved in creating lesson plans and managing a classroom for seven hours each day. The opportunities and experiences offered in the Explainer Program have helped change my life.



Plant Explorers Science Campers in the Pfizer Plant Research Laboratory

Campers Who Code

Campers enrolled in the Everett Children's Adventure Garden's Plant Explorers Science Camp in August were treated to a special visit to the Pfizer Plant Research Laboratory. Dr. Barbara Ambrose and NYBG Science staff invited them to participate in an experiment to extract DNA from a strawberry. The eager group of 8- to 10-year-olds learned that: cells are the basic unit of life and make up all plants, animals, and bacteria; DNA is the molecule that controls everything that happens in a cell; and DNA contains "instructions" that direct the activities of the cells and, ultimately, the body. When asked about her experience, an enthusiastic third grade Bronx resident bubbled, "Lots of people think science is boring, but I think it is so much fun!"

Summer Youth Employment Program

By James Vickers, Senior Director of Volunteer Services & Administration

New York City youth between the ages of 14 and 24 are eligible to participate in the Summer Youth Employment Program (SYEP), paid employment funded by the City of New York Department of Youth & Community Development, for up to six weeks in July and August. For the past 10 years, NYBG has partnered with Mosholu Montefiore Community Center to recruit SYEP participants to work with Garden staff. This year the Garden added the Children's Aid Society as a partner. Between these two provider organizations, we welcomed 37 Interns in Horticulture, the Herbarium, Edible Academy, Operations, Administration, and Visitor Services.

These internships come at a critical moment when students are deciding their college majors and careers. SYEP Interns have the chance to explore occupations citywide where they can build job-readiness skills and develop their interests. Our goal at NYBG is to expose Interns to the various types of opportunities found in a plant-focused, living museum setting such as gardening, garden-based education, collections management, community outreach, and visitor experience. Although Interns are assigned to work in specific departments, they also learn about other NYBG mission-driven efforts as well as the history of the Garden on a guided tram tour.

Participating in SYEP is one of the many ways in which NYBG builds lasting relationships with New York City youth. These internships are often their first experience with NYBG, and our goal is to create a positive connection that inspires future success in school and as they start their careers.



SYEP Intern Kevin Allison in the Ruth Rea Howell Family Garden

Science Interns Win First Prize at Citywide Symposium

By Lawrence M. Kelly, Ph.D., Associate Vice President for Science Administration and Director of Graduate Studies



Cullman Program Curator Dr. Damon Little with the first-place Hostos-Lincoln team at the 2017 Urban Barcode Project Symposium

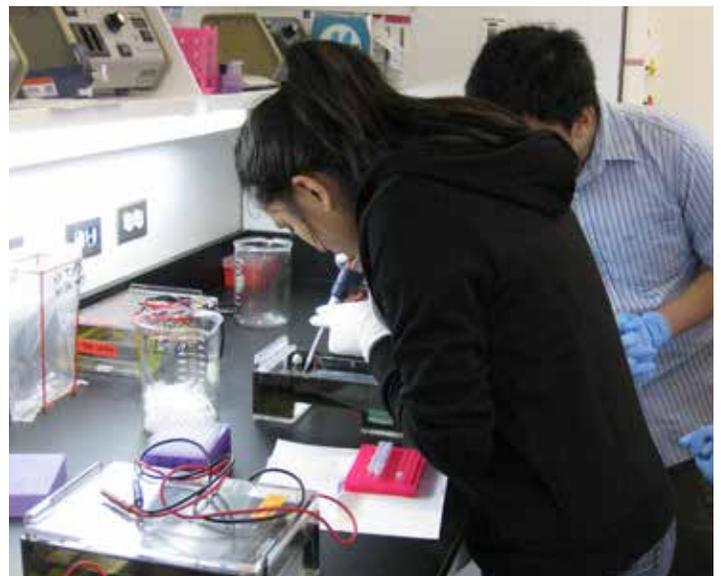
NYBG's Science Interns have diverse experiences and career ambitions, and they come from around the United States and from many different countries. Yet some of the most exciting and recognized—even award-winning—research is done by Bronx high school students who are working in our own backyard.

In 2014 NYBG began an internship program with Hostos-Lincoln Academy of Science, a 6–12 grade school in the South Bronx. Each year, 3–6 students work on research projects as teams mentored by NYBG's Damon Little, Ph.D., Associate Curator in the Lewis B. and Dorothy Cullman Program for Molecular Systematics, and Allison Granberry, Hostos-Lincoln science teacher. The research of the students is part of the Urban Barcode Project (UBP), which is a citywide effort to engage high school students with DNA technology as a tool to explore biodiversity in New York City.

This year the Hostos-Lincoln team studied the biodiversity of NYBG's Thain Family Forest, using DNA barcoding to identify roots found in soil samples. The results were then compared to an above-ground species list in order to establish how accurately below-ground plant material characterizes the above-ground ecosystem. The research results demonstrated the usefulness of DNA barcoding to describe the flora, and the team won first prize in the UBP symposium competition. This is the third consecutive year in which our Hostos-Lincoln research team has received an award of distinction in this large citywide competition.

Every graduated intern from this program has gone to college, and many are majoring in science disciplines. Lizbeth Ortigoza-Pacheco, a Hostos-Lincoln alumna who is now at

Hunter College, was on a team that used DNA barcoding to study seed dispersal of the incised fumewort, an invasive species that is spreading along the Bronx River. Lizbeth's research experience allowed her to explore her interest in science before starting college: "The opportunity to collaborate with Dr. Damon Little at The New Botanical Garden allowed me to gain extensive knowledge of plant life, research methods, and lab techniques. My goal is to use my research experience to inform others about how to prevent the spread of invasive species and also about the importance of protecting our ecosystem."



Hostos-Lincoln student Lizbeth Ortigoza-Pacheco loads a gel in the lab to analyze DNA samples.

Creating an Educational Farm and School Oasis in Morrisania

By Ursula Chanse, Director of Bronx Green-Up and Community Horticulture



High School students planting vegetable starts at Morris Campus Farm

In fall 2016, NYBG's Bronx Green-Up program was asked to support the creation of the Morris Campus Farm, one of the first educational production farms in the Morrisania section of the Bronx. The Farm Project, spearheaded and envisioned by former principal Carmen Bardeguéz-Brown and Josh Sarantitis (both co-founders of Intersection, a partner organization), focuses on mindfulness, healthy eating, and agriculture.

Morris Campus is composed of four public high schools in one of the poorest Congressional districts. Each school serves approximately 420 students. The schools have many special needs students and English Language Learners as well as students living in shelters with 20–30% of students not having a stable living situation. These students face many challenging health problems, including obesity, diabetes, mental health issues, asthma, and high blood pressure. Many families also suffer from food insecurity.

Led by Bronx Green-Up and Intersection's new Farm Manager, Mayfield Brooks, youth and staff from all four schools with community volunteers started building out the 1,400-square-foot farm in early April. More than 200 students have participated in the farm since its inception, many helping to build and fill raised garden beds, plant seeds and transplants, water, weed, harvest, and start a weekly farm stand to sell what they have grown. The farm now hosts 25 large raised beds, perennial herbs and woody shrubs, a seating area, and a storage container for tools and supplies. When completed, the farm will feature a production farm area complete with a greenhouse, outdoor classroom, mural, and meditation garden.

Through joint fundraising, 18 students also received stipends to continue building and caring for the farm during this past summer while learning cooperation, meditation, and horticulture skills as well as the benefits and pleasure of growing their food.

Graduate Student Profile

By Lawrence M. Kelly, Ph.D., Associate Vice President for Science Administration and Director of Graduate Studies



Graduate Student Cecilia Zumajo in the Plant Research Laboratory

Cecilia Zumajo first came to The New York Botanical Garden as a Science Intern in 2015. Cecilia's undergraduate advisor in Colombia, Natalia Pabón Mora (NYBG Ph.D., 2012), was a student of Favio González (NYBG Ph.D., 2007), which makes Cecilia the academic great-granddaughter of the Garden's Dr. Dennis Stevenson (Favio's advisor). Based on her lineage, it made perfect sense for Cecilia to come to NYBG to obtain a Ph.D. in Plant Science through our joint program with the City University of New York. Cecilia came to New York in 2016 to start her dissertation research in NYBG's Genomics Program, under the supervision of Dr. Barbara Ambrose. Cecilia was the 16th in a steady flow of Colombian graduate students coming to NYBG since 1966.

Cecilia is no stranger to tropical plant diversity. She grew up in Colombia, which has more than 40,000 native species of vascular plants. By comparison, the United States—nine times larger than Colombia—has approximately 17,000 species of plants. It is no surprise that somebody from such a diverse country would be inspired by plant diversity and motivated to address questions about how it came to be. Her specialty is genomics and evolutionary developmental biology. Cecilia explains, "Using genomics tools at NYBG, I have access to the most exciting, sophisticated, and modern tools to understand the genetic basis of plant diversity. The Garden is the perfect place for me, because I am interested in all plants, and especially tropical plants—not only in the model species that are used for most genetic research."

Bronx Green-Up Profile

By Ursula Chanse, Director of Bronx Green-Up and Community Horticulture



Photo by: Ryan Struck



Kadeesha Williams (right) demonstrates watering techniques to a Bronx Green-Up volunteer.

Kadeesha and Bronx Green-Up volunteers deliver plants to the Garden of Youth.

Bronx Green-Up's Community Horticulturist/Urban Agriculturist, Kadeesha Williams, is very familiar with the art of community gardening, having grown up working at Taqwa Community Farm in the Highbridge neighborhood of the Bronx. Her grandfather, mother, and father all have a background in farming from South Carolina. They worked together in 1992 to start to change the debris-filled corner lot into a thriving neighborhood farm.

Soon after, much of the local community joined in its creation and care. Taqwa now hosts a long-standing farmers market, chickens, children's programs, and community workshops and events. Bronx Green-Up's archival records include notes from a site visit in 1993 of a wonderful family garden and indicated the need, similar to today's, of woodchips, compost, and plants.

By volunteering at Taqwa from a young age, Kadeesha was inspired to pursue a career in agriculture and education. Prior to Bronx Green-Up, she worked for five years at Active Citizen Project, where she managed an agricultural training program for youth and adults as well as a summer farm apprenticeship program.

Early in 2016, Kadeesha became Bronx Green-Up's new Community Horticulturist/Urban Agriculturist and jumped right into leading the *Grow More Vegetables Certificate Series*, which teaches organic vegetable gardening skills to those who will pass on what they learn to others in their communities. She is responsible for conducting workshops and providing technical

assistance to strengthen the capacities of Bronx community gardeners and urban farmers. This past summer, she led the *Grow More Vegetables with Youth* program, a collaboration with five community partners, totaling 55 youth. Throughout the six-week program, she discussed food justice issues, healthy eating, soils, and seed-starting. She found ways to incorporate hands-on learning and fun activities, culminating in students sharing their final projects and presentations.

"I'm always very impressed with how much the youth we work with already know about social justice and food security. It makes all the work I do with them totally worth it, and I think helps others see why the work Bronx Green-Up does is so important to the communities we all live in and serve."

Kadeesha Williams

Sharing with others the importance of growing your own food has been a joy of hers for many years. Kadeesha looks forward to continuing that work and passion here at The New York Botanical Garden.

School of Professional Horticulture Students Excel Through Internships

By Charles M. Yurgalevitch, Ph.D., Director of the School of Professional Horticulture



Ralph Portillano at Oak Spring Garden Foundation



Wambui Ippolito at Cantitoe Corners



David Pintauro at Landcraft Environments, Ltd.

The School of Professional Horticulture is a two-year, full-time hands-on horticulture training program whose mission is to educate and train motivated individuals to become horticulturists of the highest caliber. To accomplish this, the School combines its high-quality academic component along with the real-world training provided by our expert Horticulture team that makes our students highly sought after even having just completed their first year. In their second year, a six-month internship serves to further hone students' skills, and they receive additional training in one of the many facets of the broad horticulture industry. Nine students in the Class of 2018 are currently interning at a variety of public and private sites.

Ralph Portillano, whose previous career was in retail and event design, is at Oak Spring Garden Foundation in Upperville, Virginia, where he is working in their vegetable gardens, greenhouses, cut flower gardens, and orchards, and on special projects he has been assigned to along with additional responsibilities and challenges. Ralph enrolled in the School in order to gain a strong foundation in the green industry and develop the confidence in his knowledge and skill set to excel in whatever career path he chooses. He said that the skills he learned in the first year of the School's program helped him to hit the ground running in his internship and was underscored by his supervisor, Randy Embrey, Oak Spring's head gardener.

Wambui Ippolito is an intern at Cantitoe Corners, more commonly known as Martha Stewart's farm. She chose this

site because she knew it operates at a very high professional level, on a par with the horticulture standards practiced here at NYBG. Wambui was also aware that Martha insists on a sustained level of excellence. All of her vegetables and flowers are started from seed and she utilizes the latest technology to maximize growth from seed to maturity. Wambui noted that she is fortunate to work closely with Martha, considering how demanding her schedule may be. She adds, "My rotations helped me realize what I want to do—exhibitions, learning new aspects of horticulture, and keeping abreast of the latest information."

David Pintauro is an intern at Landcraft Environments, Ltd., a nursery in eastern Long Island owned by Dennis Schrader, who also serves on the School's Board of Advisors. David came to the School knowing he would get the best possible education as a career-changer. He said the strong science component of the curriculum has given him the confidence to diagnose various pest problems that can arise at any time. While he says he still has much to learn, he knows a lot about plant health care thanks to the School. He adds, "I couldn't have picked a better internship and now that it's almost over, I look back at how much I've learned. The real-world experience gained while on this internship is an education that cannot be replicated in a classroom."

As with all students at the School, they graduate with a solid and strong foundation to launch their careers in the green industry.

NYBG Participates in Inaugural CUNY Cultural Corps Program



(l-r) Mark Cupkovic, NYBG Vice President for Security and Operations; Jorge Mendez, CUNY Cultural Corps Member; Ayodele Oti, CUNY Cultural Corps Manager; Aaron Bouska, NYBG Vice President for Government and Community Relations; Marc Donnelly, NYBG Project Manager

The City University of New York (CUNY) has partnered with New York City's Department of Cultural Affairs (DCLA) and The Rockefeller Foundation to launch the CUNY Cultural Corps, which creates opportunities for CUNY students to gain valuable experience while working through paid internships in the city's arts and culture institutions. The program was initiated following a 2015 survey of DCLA's hundreds of grantee organizations, which revealed that while the city's cultural sector is far more diverse than cultural organizations on a national level, it lags behind the demographic diversity of the city's population. The CUNY Cultural Corps aims to be a strong student pipeline for motivated alumni to pursue fulfilling careers in the City's arts and culture fields.

As one of the inaugural participating cultural institutions, NYBG was pleased to mentor three interns. Jorge Mendez, a junior at CUNY majoring in physics math, and education, worked in the Operations department from September 2016 to February 2017, supervised by Mark Cupkovic, Vice President for Security and Operations. Jorge's assignment was to design and present options for a new ADA ramp behind the Enid A. Haupt Conservatory that would replace a weather-worn existing ramp. This entailed researching and becoming familiar with the current ADA guidelines and requirements for such a structure, appropriate building materials, site restrictions, as well as demolition and construction plans. Throughout his internship, Jorge kept a meticulous log journal. Using both computer programs (such as AutoCAD) and traditional drawing techniques (pencil and paper), he eventually created three design options for consideration by the NYBG review team, consisting of representatives from Operations, Horticulture, and Capital Projects. The selected design that was constructed and installed in March 2016 now serves many visitors in an aesthetically and functionally pleasing way. During his final project presentation,

he was asked what his career aspirations are at this juncture. Although he has not made up his mind, he is inclined to become a high school physics teacher, hoping to mentor students to pursue science careers they might not otherwise consider.

Mark noted, "Jorge did a commendable job working at the Garden. Even though CAD, design, and project management were not in his field of study, he was able to adapt and utilize his skill set to complete a major task. His NYBG experience provided him with a sense of focus and accomplishment."

"I am grateful to have the opportunity to work with The New York Botanical Garden on this project. After months of design, meetings with stakeholders for their input, and construction, we created a new ramp that will assist schoolchildren and wheelchair users to be able to access the Enid A. Haupt Conservatory." Jorge Mendez



New ADA ramp behind the Enid A. Haupt Conservatory

Summer Science Internship Program

By Barbara A. Ambrose, Ph.D., Director of Laboratory Research and Associate Curator of Plant Genomics, and Lawrence M. Kelly, Ph.D., Associate Vice President for Science Administration and Director of Graduate Studies



NYBG Life Trustee Lewis B. Cullman chats with 2017 Plant Science Research Laboratory Interns at the Cullman Intern Luncheon, (l-r): Carly Zelner, Olga Khmel'nitsky, Ally Anderson, and Julia Beros.

The New York Botanical Garden has a diversity of hands-on education and training programs in the life sciences for students of all ages, and Science internships are an important step in this pathway. Each year the Garden places 30–50 high school and college students in Science internships. Interns work directly with Garden scientists, and they participate in cutting-edge research. Interns gain valuable experience that helps prepare them for college, graduate school, and careers in science and education.

This summer, we had 34 Interns working on projects in the William and Lynda Steere Herbarium, the Institute of Economic Botany, the Institute of Systematic Botany, the Genomics Program, and the Lewis B. and Dorothy Cullman Program for Molecular Systematics. Summer Interns contribute to ongoing research projects as they learn to use the tools to address their research questions and they are guided through the discovery process. The interns grow through the experience as they realize their work is original, and they quickly take ownership and pride in the research project.

Carly Zelner, a former NYBG High School Explainer (2014), worked with Dr. Barbara Ambrose and Laboratory Manager

Tynisha Smalls to isolate genes that are involved in root development of ferns. Mordechai Sternman, an undergraduate at Queens College, worked with Dr. Dennis Stevenson and Laboratory Technician Samantha Frangos to identify the genes that allow plants to grow under severe drought and low nitrogen conditions. Ally Anderson, a student at The Taft School, worked with Dr. Damon Little to develop an algorithm for an electronic plant identification program. Fordham University Intern Sereene Kurzum worked with Drs. Fabián Michelangeli and Marianna Vasconcellos to explain and predict the distributions of plant and animal species in the endangered but megadiverse Brazilian Atlantic Forest. Six undergraduate Interns received training in an intensive NSF-supported Plant Diversity Internship program in connection with Dr. Gregory Plunkett's research on the evolution and systematics of the genus *Schefflera* (Ginseng family). All Interns benefited from a ten-week enrichment program consisting of tours, lectures, and discussions about science at the Garden. Summer is very busy for science at the Garden, but we always finish satisfied knowing that we have advanced our Interns along the pathway to science careers.

New Library Children's Titles Emphasize Diversity

By LuEsther T. Mertz Library Staff

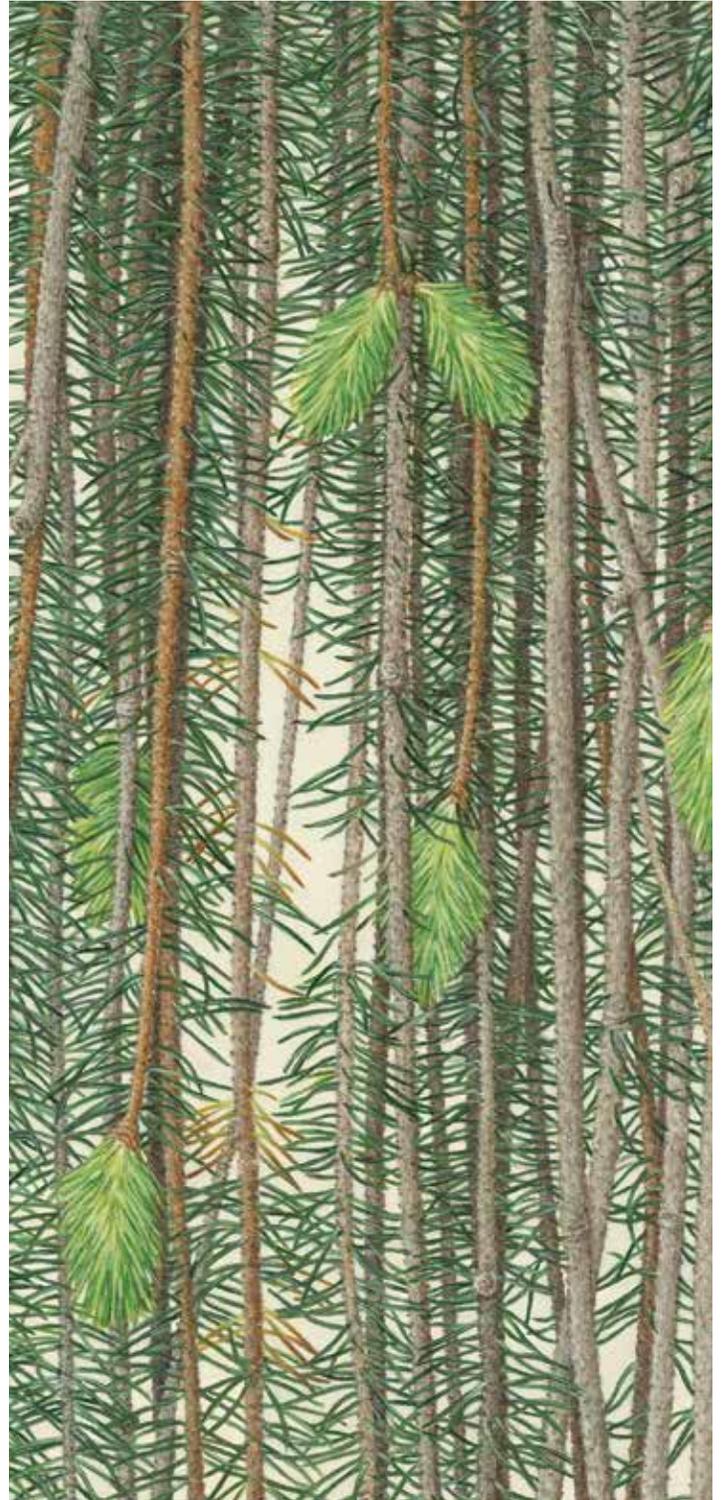
One of the LuEsther T. Mertz Library's many special collections features juvenile literature. This collection contains botanical titles written for children dating from the early 1800s to the present day. In addition to non-circulating historic works, the Library also has a circulating children's collection that contains more recent books related to botanical topics. Over the past year, Library staff have been building this collection with books that reflect the diversity of New York City communities. They are committed to adding new and wide-ranging titles so that young Library visitors can engage with and learn from NYBG's collections. Children's books that feature characters from various ethnic backgrounds help our readers see reflections of themselves gardening, exploring, cooking, and many other activities with lifelong benefits.

The titles that staff have focused on acquiring represent diverse cultures and languages. In the past year, 48 new titles were added, all of which feature either diverse characters, bilingual text, or a combination of both. Noteworthy recent acquisitions include *Auntie Yang's Soybean Picnic* by Ginnie Lo, *Anywhere Farm* by Phyllis Root, *The Ugly Vegetable* by Grace Lin, *Community Soup* by Alma Fullerton, *Margarito's Forest* by Andy Carter, *Bugs for Lunch/Insectos Para el Almuerzo* by Margery Facklam, and NYBG Press's *Wonders in the Garden*.

The Mertz Library will continue to seek out titles that offer diverse perspectives of the natural world for our youngest visitors.



New children's books in the LuEsther T. Mertz Library



Ingrid Finnan, Snake Branch Spruce (detail), 2016. *Picea abies* 'Virgata'
The New York Botanical Garden, Bronx, New York, oil on paper, 13-1/2 x 10-1/2 inches

Out of the Woods: Celebrating Trees in Public Gardens

Third NYBG Triennial, November 18, 2017–April 22, 2018

Out of the Woods marks NYBG's third exhibition in conjunction with the American Society of Botanical Artists (ASBA), following *Green Currency: Plants in the Economy* in 2011 and *Weird, Wild, & Wonderful* in 2014. Founded in 1994, ASBA is a community devoted to the tradition and practice of botanical art, with nearly 1,300 individual members and more than 20 institutional members from all over the world.

An international cohort of more than 200 artists responded to ASBA's call for entries for this exhibition, which is devoted to works of art depicting trees found in botanical gardens and arboreta. A jury comprising artists and NYBG staff selected 43 works in a variety of media. The trees depicted in the exhibition come from public collections worldwide, from a bonsai museum in Japan to the historic botanical gardens of Europe to the grounds of NYBG.

Botanical art possesses a unique power among fine art forms to educate about plants and promote ecological awareness. The pieces in this exhibition are beautiful, but their beauty resonates for much longer than the time we spend looking at them. The artistry with which each specimen is rendered inspires us to take greater notice of the awe-inspiring qualities of the trees around us. A hawthorn or magnolia might draw our focus when in flower, but the botanical artist sees more: a gnarled root, the rainbow hues of lichen, or the cherry-red clusters of seeds. *Out of the Woods* captures these small moments of natural wonder.



Betsy Rogers-Knox, *Renewal—Eastern Hemlock*, 2017. *Tsuga canadensis* Mary Flagler Cary Arboretum, Millbrook, New York, watercolor on paper, 19 x 26-1/2 inches

Georgia O'Keeffe: Visions of Hawai'i Opening May 2018

By Joanna Groarke, Director of Public Engagement and Library Exhibitions Curator



Harold Stein, *Georgia O'Keeffe in Hawaii*, 1939. Gelatin silver print, 5 x 4.5 inches. Gift of The Georgia O'Keeffe Foundation, Georgia O'Keeffe Museum, Santa Fe, NM, USA. [2006.6.0754]

Georgia O'Keeffe, *Heliconia—Crab's Claw Ginger*, 1939. Oil on canvas, 19 x 16 inches. Collection of Sharon Twigg-Smith.

In 1939 Georgia O'Keeffe, who at age 51 was among the most famous artists in the United States, accepted a commission from the Hawaiian Pineapple Company to produce two paintings for advertising campaigns. Her nine weeks in the tropical Hawaiian landscape resulted in more than 20 works, which reveal that O'Keeffe—most commonly associated with the stark deserts of New Mexico—was profoundly inspired by her experience there. *Georgia O'Keeffe: Visions of Hawai'i*, will explore this chapter in the artist's career as well as the ecological complexity of the Hawaiian Islands—one of the most biologically diverse places on Earth—hidden behind O'Keeffe's depictions.

In the LuEsther T. Mertz Library's Art Gallery, O'Keeffe's stunning views of mountains and waterfalls and her signature close-cropped views of flowers and plants she encountered on the Hawaiian Islands will be featured in an exhibition of more than 15 paintings, not seen together in New York since their 1940 debut, curated by Theresa Papanikolas, Ph.D., of the Honolulu Museum of Art. A lush flower show in the landmark Enid A. Haupt Conservatory will evoke the gardens and landscapes that inspired O'Keeffe. Designed by Tony Award-winning set designer Scott Pask, the exhibition will showcase the remarkable beauty and richness of Hawai'i's wild and cultivated flora. Beds bursting with ti, frangipani, bougainvillea, heliconia, hibiscus, bird of paradise, and other tropical favorites will lead visitors to a *hale*, an open-sided thatched-roof pavilion inspired by traditional Hawaiian architecture. There, visitors will be introduced to the profound importance of plants in Hawaiian culture and efforts to preserve Hawai'i's imperiled flora through stories of canoe plants—those brought to the Islands 1,700 years ago by Polynesian settlers.

A rich program of performances, events, and activities will celebrate the diverse cultural traditions of Hawai'i past and present. Overall, the experience will serve as a compelling—and beautiful—starting point to examine the transformation of the Hawaiian landscape through human and cultural influences.

Francisca P. Coelho: An Appreciation

By Todd A. Forrest, Arthur Ross Vice President for Horticulture and Living Collections



Francisca P. Coelho, Vivian and Edward Merrin Vice President for Glasshouses and Exhibitions, will retire in October 2017 after a 36-year career at NYBG.

In 1979, while leafing through a magazine at the American Embassy in Port of Spain, a young Trinidadian named Francisca Planchard came across a small advertisement for the School of Professional Horticulture at The New York Botanical Garden. She had been considering leaving her job in agricultural chemicals to pursue the passion for plants she had developed while tramping around the rain forests of Trinidad with her father. Although she had never been to New York, she bravely decided to leave home and come to NYBG.

Never has one small advertisement done so much for an institution. Francisca, who met her husband, James Coelho, at NYBG, joined the Horticulture staff after graduating from the School of Professional Horticulture in 1981, and has spent most of the past 36 years making magic under glass. She has had many titles, from Plant Recorder to Vice President, but has always been, first-and-foremost, a genius plantswoman. She has coaxed endangered cycads, towering palms, beguiling orchids, and countless other tropical rarities to thrive in expertly amended soil beneath a canopy of 1/8"-thick glass.

The world has taken notice of Francisca's talents. In his review of our 2014 exhibition, *Groundbreakers: Great American Gardens and The Women Who Designed Them*, garden writer Robin Lane Fox wrote, "This remarkable part of the exhibition

is the work of a present-day groundbreaker, Francisca Coelho, curator of the NYBG glasshouses. She is my confident nomination as the best female head gardener at present working under glass."

Mr. Lane Fox was responding to Francisca's incomparable artistry with plants, which brought the work of pioneering landscape architect Beatrix Farrand to life within the exhibition houses of the Enid A. Haupt Conservatory. Throughout her distinguished career, Francisca has channeled a roster of luminaries, including Charles Darwin, Roberto Burle Marx, Emily Dickinson, Claude Monet, Frida Kahlo, and Celia Thaxter. She has also captured and conveyed the essence of the Imperial chrysanthemum display in Tokyo, the Moorish gardens of the Alhambra, the botanical garden at Padua, the Orchid Garden at Singapore, and too many other locations to name here.

At the end of October, Francisca will step aside from her role as Vivian and Edward Merrin Vice President for Glasshouses and Exhibitions to spend more time traveling and tending her own garden. However, she won't be leaving NYBG entirely; for the next three years, she will continue to work with us to design exhibitions and advise on the restoration of the Palm Collection. We will have several more years to enjoy, and learn from, her horticultural artistry.

Autumn Beauty in the Judy and Michael Steinhardt Maple Collection

By Deanna F. Curtis, Curator of Woody Plants and Landscape Project Manager

Spring is often considered a gardener's favorite season, with all its cheerful blooms, but for the tree enthusiasts among us, autumn is the most treasured time of year. Once the nighttime temperatures begin to drop, deciduous trees in the Northeast start their annual color show, and we revel in the spectacle as it unfolds across the landscape.

A trip to NYBG in fall would not be complete without a visit to the Judy and Michael Steinhardt Maple Collection, recently renovated and expanded in 2016 to include more than 160 maples representing 135 different species, hybrids, and cultivars. A beautiful contemplative space year-round, this sunny plateau lights up as the maples burst into yellows, oranges, reds, and purples.

Native autumn charmers such as sugar maple and red maple grow alongside Asian maple species chosen for their seasonal beauty and suitability for New York-area gardens. The wide-spreading limbs of a grand trident maple specimen glow golden near the entrance to the Collection, while the leaves of Manchurian maple and paperbark maple turn fiery scarlet and a diverse array of Japanese maple cultivars display a kaleidoscope of color. Don't miss the autumnal glory of NYBG's Steinhardt Maple Collection this October and November.



Judy and Michael Steinhardt Maple Collection

Sustainability Update

By Mark Cupkovic, Vice President for Security and Operations

The NYBG Operations Department continues to seek funding opportunities through the NYC DCAS/Department of Energy by applying for programs such as ACE (Accelerated Conservation and Efficiency) and ExCEL (Expense for Conservation and Efficiency Leadership). The ACE program is for capital replacements (larger projects) and the ExCEL program is for operational projects; both require a reduction of carbon emissions through energy reduction and must meet a pay-back for the installation. The sooner the pay-back the better chance of receiving the award. As part of the ACE program for Fiscal Year 2017, the Operations Department installed a new natural gas circulating hot water boiler system at the Operations Office. This natural gas boiler installation replaced a 30-year-old oil/steam boiler and will show a pay-back in four years.

In Fiscal Year 2018 NYBG will complete the installation of the conversion of exterior lighting from High Intensity Discharge to LED. In FY2017 as part of the ExCEL program, the Engineering department converted domestic water boosting systems from standard pressurized systems to Variable Frequency Drive (VFD) motors "on demand systems" that has shown a 40% reduction in energy use. These systems were installed at the Enid A. Haupt Conservatory, Watson Education Building, LuEsther T. Mertz Library Building, and Garden Terrace Room. In addition the 20-year-old hot water boilers at the Garden Terrace Room were replaced with high efficiency condensing boilers. The fume hoods at the Pfizer Lab were equipped with motion sensors to reduce the airflow through the unit when not in use, and the cooling towers that serve the International Plant Science Center (IPSC) were equipped with VFD motors that will also reduce electrical demand. Looking ahead to FY2018, the ExCEL program awarded the Garden a grant to install "smart valves" in the IPSC that will optimize the flow of hot and cold water through the tempered water supply coils to reduce the electrical and natural gas load for the Garden.

NYBG continues to search for new technologies through the IDEA program at DCAS and has recently been awarded grants to install HTF, a nano-technology additive to improve the heat transfer in glycol (antifreeze) back to that of water at the Pfizer Lab in both the cooling and heating systems, and a grant to install solar fabric program tents at the base of Tulip Tree Allée. Use of these cutting-edge products and technologies to reduce its energy consumption and carbon footprint helps the Garden to remain at the forefront of sustainability efforts among New York City cultural institutions.

Gregory Long Awarded Honorary Doctorate of Humane Letters



Gregory Long received an Honorary Doctorate of Humane Letters at Fordham University.

On May 20, 2017, Fordham University awarded an Honorary Doctorate of Humane Letters to Gregory Long, CEO and The William C. Steere Sr. President, for his efforts in leading the transformation of The New York Botanical Garden into a world-class resource for conservation, education, and research. Excerpts from the citation include:

"The Garden expanded its collections, strengthened its science-based conservation programs, and added educational offerings for learners at all levels, from preschoolers to graduate students to those who seek continuing education. Today, the Botanical Garden's dynamic exhibitions and programs serve more than 1 million visitors annually.

Under Long's leadership, the Garden reached across Southern Boulevard to form academic collaborations involving Fordham faculty and students, and later joined Fordham in creating the Bronx Science Consortium, a group of five local institutions working together to advance scientific research, education, and community engagement.

Over the past three decades, The New York Botanical Garden has grown into a world-renowned research, educational, and conservation organization that offers a compelling model for how similar institutions can thrive. And this has all happened under the visionary leadership of Gregory Long."

Upcoming Special Events

Please join us for these upcoming special events, proceeds from which support a wide range of NYBG mission-driven efforts:

Holiday Train Show® Family Benefit

Wednesday, November 29; 4–8 p.m.

Celebrate the holiday season with this new and exciting family event perfect for kids of all ages! The Benefit includes a special, private viewing of the *Holiday Train Show®*, a festive family dinner, winter garden treats and activities, including an apple cider press, woodland terrarium building, gingerbread cookie decorating, and so much more. Gather your closest family and friends for a fun New York holiday experience you won't want to miss! Proceeds support NYBG's Edible Academy, hub of the children's vegetable gardening program.

Winter Wonderland Ball

Friday, December 15; 7:30 p.m.

Now in its 19th year, the Winter Wonderland Ball remains New York City's most fashionable party of the holiday season, a black tie event featuring cocktails, dinner, and dancing in sight of the Haupt Conservatory's twinkling holiday display. This dazzling evening has become synonymous with NYC glamour and nightlife.



The Orchid Dinner

February 2018

NYBG's annual Orchid Dinner will take place at The Plaza. A harbinger of spring, it is one of the most anticipated and beautiful events of the New York late-winter season. This high-profile event showcases the most exquisite display of orchid centerpieces imaginable, all created and donated by leading designers from the worlds of fashion, interior design, landscape design, floral design, and architecture.

For more information and to purchase tickets, please contact the Special Events office at 718.817.8710 or events@nybg.org

Recent Grants Support NYBG's Wide-Ranging Work

The New York Botanical Garden has recently received several important grants to support diverse projects and programs, including science-based plant conservation efforts as well as fascinating exhibitions that serve more than one million visitors annually.

- The 2018 Garden-wide exhibition, *Georgia O'Keeffe: Visions of Hawai'i*, has received a major grant from the **National Endowment for the Humanities** (NEH). The \$250,000 award will support the implementation of this exhibition and related programming. This is the Garden's sixth grant from the NEH for exhibitions.
- **The Leona M. and Harry B. Helmsley Charitable Trust** awarded NYBG a \$200,000 grant to extend its current three-year project, *Plant Conservation and Forest Resource Management Program in Myanmar*, for a fourth year. This funding will support NYBG's efforts to fill major gaps in the understanding of Southeast Asian plant diversity, improve Myanmar's scientific infrastructure, and replicate a successful model of sustainable use of forest resources.
- **Con Edison** has renewed its support in the amount of \$175,000 for Greening the Garden, a NYBG program to educate the public and encourage energy efficiencies and sustainable initiatives for a more environmentally friendly world.
- The **Starr Foundation** has awarded NYBG a two-year grant of \$250,000 to support the C.V. Starr Virtual Herbarium, which makes millions of specimen records available electronically for use in biodiversity research projects.
- In support of the Edible Academy, key strategic partnerships have been confirmed with the following corporations: **Whole Foods Market** (\$220,000), **Blue Apron** (\$200,000), **Sabra Hummus** (\$50,000), and **Target** (\$50,000).

Making a Gift to the Garden



Did you know that there are many ways to make a gift to benefit the future of the Garden?

You can make a gift of appreciated stocks and bonds. A gift of securities, including stocks or bonds, is an easy way for you to make a gift, and you can avoid paying capital gains tax that would otherwise be due if you sold these assets.

You may be able to make a gift of real estate. A gift of real property (such as your home, vacation property, vacant land, farmland, or ranch or commercial property) may make a great gift and if you own appreciated real property, you can avoid paying capital gains tax by giving it to the Garden.

You can name NYBG as a beneficiary of your retirement assets. When you name the Garden as a beneficiary of your retirement account, NYBG is not taxed upon receiving the retirement plan assets. Therefore 100% of this gift can be used to you help sustain the Garden's mission and provide support for its acclaimed collections and programs for generations to come.

You can name the Garden as a beneficiary of your life insurance policy. A gift of your life insurance policy is an excellent way to make a gift to NYBG. If your life insurance policy is no longer needed or will no longer benefit your survivors, consider naming NYBG as a beneficiary and help further our mission.

For more information, please contact Lisa Sifre, Director Planned Giving, at 718.817.8545 or lsifre@nybg.org

Donors and Partners

Bronx Green-Up

Support provided by Anderson-Rogers Foundation, Inc., Sidney and Judith Kranes Charitable Trust, Lemberg Foundation, Inc., Levitt Foundation, Newman's Own Foundation, and Dr. Robert C. and Tina Sohn Foundation

Greening the Garden

Support provided by Con Edison to educate the public and encourage energy efficiencies and sustainable initiatives for a more environmentally friendly world

Explainer Program

Support provided by Clif Bar Family Foundation, Everett Foundation, The Goergen Foundation, Macy's, The Pinkerton Foundation, and Jon Ben Snow Memorial Trust

School of Professional Horticulture

Support provided by the Geraldine Stutz Trust

Georgia O'Keeffe: Visions of Hawai'i

LuEsther T. Mertz
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Any views, findings, conclusions, or recommendations expressed in this exhibition do not necessarily represent those of the National Endowment for the Humanities.

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The Orchid Dinner

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26th Annual *Holiday Train Show*[®]
November 22, 2017–January 15, 2018



© Robert Benson Photography

Inside the twinkling glow of the Enid A. Haupt Conservatory, enchanting model trains zip through a display of 150 landmarks, each re-created with bark, leaves, and other natural materials. This year's exhibition showcases Midtown Manhattan, with iconic skyscrapers and other architectural wonders sharing the spotlight among old and new collection favorites that define this celebrated district. Visit nybg.org for tickets and more information.



The New York Botanical Garden is an iconic living museum. As an oasis in this busy metropolis since its founding in 1891, we look forward to the Garden's continued leadership as a dynamic New York City cultural institution.

A National Historic Landmark, this 250-acre site's verdant landscape supports over one million living plants in extensive collections. Each year more than one million visitors enjoy the Garden not only for its remarkable diversity of tropical, temperate, and desert flora, but also for programming that ranges from renowned exhibitions in the Haupt Conservatory to celebrations on Daffodil Hill.

The Garden is also a major educational institution. Nearly 300,000 people annually—among them Bronx families, schoolchildren, and teachers—learn about plant science, ecology, and healthful eating through NYBG's hands-on, curriculum-based programming. Over 85,000 of those visitors are children from underserved neighboring communities, while more than 3,200 are teachers from New York City's public school system participating in professional development programs that train them to teach science courses at all grade levels.

NYBG operates one of the world's largest plant research and conservation programs, with nearly 200 staff members—including 80 Ph.D. scientists—working in the Garden's state-of-the-art molecular labs as well as in the field, where they lead programs in 49 countries.

Learn more at nybg.org

NYC Cultural Affairs The New York Botanical Garden is located on property owned in full by the City of New York, and its operation is made possible in part by public funds provided through the New York City Department of Cultural Affairs. A portion of the Garden's general operating funds is provided by The New York City Council and The New York State Office of Parks, Recreation and Historic Preservation. The Bronx Borough President and Bronx elected representatives in the City Council and State Legislature provide leadership funding.

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Exhibitions in the Arthur and Janet Ross Gallery are made possible by the Arthur and Janet Ross Fund.

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