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DIVERSITY MATTERS

School of Engineering and Applied Science Diversity and Inclusion Newsletter

Computer Science students (left to right) Khandaker Momataz, Anika Duffus, Sonia Gu, Carina Lewandowski, and Wendy Ho, participated in transforming their engineering skills for social good, answering a nation-wide call last summer for social equality and anti-racism action. Photo by Aaron Nathans.

Welcome to everyone in our Engineering Community!

I welcome you to the first edition of the School of Engineering and Applied Science's Diversity and Inclusion newsletter. You will find the latest news about our diversity and inclusion efforts and the progress we are making toward achieving academic excellence in a community that is truly inclusive and representative of society. We do this also knowing that a community rich in diversity expands the range of knowledge, experiences, and viewpoints that are critical for creating innovative solutions to the pressing engineering challenges facing us in the twenty-first century.

Now is a good time to reflect on the strength of the community, having recently celebrated the accomplishments of our graduating seniors and graduate students as well as the close of a most singular and challenging academic year.

IN THIS ISSUE

PRINCETON
School of Engineering and Applied Science

Despite navigating myriad unforeseen challenges in their courses, research, administrative work and personal lives, our faculty, students, and staff stepped forward to strengthen our engineering community. Many undergraduates undertook projects aimed at enhancing equity and inclusion, and graduate students took extra time to encourage and welcome newly admitted and first-year colleagues. We celebrate new staff, faculty, and postdoctoral fellows who joined our SEAS community, including Dean Goldsmith who joined us last September.

Our Office of Diversity and Inclusion also has much to celebrate. Despite the pandemic, we forged ahead in our recruitment efforts and saw the largest number of graduate applicants to engineering, and admitted the greatest number of applicants from diverse backgrounds in the school's history. We welcomed the second cohorts of the Pathways to Graduate School (PGS) and Pathways into the Academy (PPIA) programs and offered many online materials to enhance the success of diverse groups at Princeton and beyond. And we are busy preparing exciting initiatives for the coming year.

Julie Yun
Associate Dean of Diversity and Inclusion
School of Engineering and Applied Science
Princeton University

Dean's Note

Thank you for reading this newsletter and taking a moment to engage with us in the critical work of broadening inclusion in science and technology. Our school and the engineering profession cannot thrive in solving the greatest challenges facing humanity without embracing the diverse ideas and experiences of people of different backgrounds. My experience as an academic, entrepreneur, and leader has convinced me that SEAS cannot reach its full potential unless we welcome all talented contributors to the school and provide a community where they can reach their full potential.

In this first year in my role as dean, I have made improving diversity and inclusion at Princeton Engineering one of my highest priorities. Working with Julie Yun and committed collaborators across the school, we have made some exciting progress and have identified much more work to do. (See the overview of our Diversity and Inclusion Action Plan on the next page.) You'll find many perspectives from our vibrant community throughout this newsletter. This work is buoyed by a shared commitment across Princeton, from the senior administration to the faculty, researchers, students, staff, and also our wonderful alumni. We welcome your ideas and suggestions on improving diversity, inclusion, and equity in the SEAS community.

Andrea Goldsmith
Dean, School of Engineering and Applied Science
Princeton University

SEAS Diversity and Inclusion Action Plan

At Princeton, we honor the fundamental value and dignity of all individuals. We are committed to promoting equitable access to educational opportunities to all individuals and aspire to create and maintain an environment that respects diverse identities, perspectives, and experiences to promote the success and well-being of every member of our community.

The continued violence perpetrated against Black Americans last year motivated us to reflect on ways that we could take action to address institutional and systemic forms of racism first within our systems and beyond. Last summer, the dean of engineering and applied science charged all the departments and centers in the school to examine policies and practices that might promote racism and bias. At the end of summer, we held division-wide meetings to discuss ideas, from which we created a school-wide Diversity and Inclusion Action Plan to counter racism and better promote equity in engineering. The plan identified three main areas to address, which are summarized below along with initial actions and results to date:

- **Eliminate Barriers to access to the School of Engineering and increase diversity of all constituent groups: faculty, postdocs, graduate students, undergraduate students, and staff.**

We are making significant inroads into advancing our diversity goals through an examination of our processes and practices and the introduction of innovative programs.

For instance, to further diversify our graduate student population, we employed targeted communication strategies such as our Why Princeton Engineering Campaign; reviewed admission procedures to eliminate bias in selection processes and address barriers to access such as funding; created programs to support students in applying to graduate programs; worked with central administration to increase the number of graduate slots allotted to engineering and targeted those slots to increase diversity; introduced new graduate program options such as the new tuition-free MEng program which piloted as an option for undergraduates to leave with a masters to leverage in advancing their career and academic goals.

All told, the impact of such efforts was a significant rise in the diversity of our graduate students—a 24% increase in women graduate students (accounting for 35% of all newly matriculating students this fall) and a 60% increase in domestic graduate students from traditionally underrepresented racial/ethnic backgrounds (accounting for 11% of newly matriculating graduate students this fall).

Faculty diversity was enhanced by targeted recruitment efforts and active engagement by the dean who reviewed faculty hiring processes, which led to the creation of best practices for faculty hiring and the implementation of these practices to better promote equity in faculty hiring. Dean Goldsmith has also actively engaged candidates for new faculty positions to build a shared understanding of how Princeton Engineering can advance their careers and maximize their impact. Such active engagement has resulted in an increased level of diversity in our faculty hires. In particular, of the faculty hires over the past year, roughly 53% were of women and 24% were of faculty from underrepresented racial and ethnic backgrounds. We also made progress toward expanding the faculty pipeline for graduate students and postdocs from underrepresented backgrounds through our Pathways into the Academy Program, which has supported 25 prospective candidates since its launch in 2019.

- **Enhance the inclusivity of SEAS culture and promote success for all community members through the development of new programs, divisional and departmental trainings, and community building events. Some highlights of programs launched:**

We worked closely with colleagues in Counseling and Psychological Services, McGraw Center for Teaching and Learning, as well as the Graduate School's Grad Futures Program to craft workshops and events to support the wellbeing, cognitive development, and professional development of engineering graduate students to promote the success of our graduate student community.

The engineering school created an alternate pathway through freshman year, embedding math and physics in the context of engineering applications, with a particular emphasis on societally relevant grand challenges. By teaching in a different manner than a typical AP math or physics curriculum in high school, students who have had more preparation are not as advantaged by having seen material before. This is especially important in the first several weeks of their first year, when students are forming their self-identities. As a result, we believe students perceive a more even playing field and are less likely to be subject to stereotype threat. This reduced attrition of promising students from more than 20% to 10% and enhanced the diversity in the undergraduate student population.

Cognizant of the continued need for training and greater community for our postdoctoral researchers, we launched a school-wide Postdoctoral Orientation in the fall of 2020 and launched the SEAS Postdoctoral Success Program in 2021 to promote community building and professional development among our researchers.

- **Enhance transparency and accountability around diversity and inclusion through the completion of a website, the establishment of a School of Engineering Diversity and Inclusion Advisory Committee, a School of Engineering town hall, and the launching of this newsletter.**

A SEAS Diversity and Inclusion Advisory Committee is being created to strengthen the school's commitment to diversity and inclusion by providing a platform across the division to identify needs and concerns related to diversity, belonging, and equity and to inform coordinated actions and initiatives. This advisory committee will also serve to enhance the school's efforts to build greater transparency and accountability to stakeholders on our progress towards creating a more diverse, equitable, and inclusive division. The membership will consist of the Associate Dean for Diversity and Inclusion and leaders of the five Diversity and Inclusion Action Committees representing the core constituent groups the engineering school: faculty, staff, postdoctoral fellows/research associates; graduate students, and undergraduate students.

Lastly, a new website, https://engineering.princeton.edu/diversity-and-inclusion, includes a dashboard of current statistics and progress.

Diversity Spotlight

Alejandro Rodriguez: "Ask yourself, what's driving you —what's propelling you in life?"

by Amelia Herb

"Each to his trade," is the translation of the title of a poem about a mountain and a squirrel that concludes with the squirrel showing the mountain how they each have their very different, but valuable skills. José Martí, who translated the original poem from Ralph Waldo Emerson into Spanish, is considered a Cuban national hero due to his role in liberating Cuba from Spain. He united Cubans under a liberal democratic philosophy of mutual respect for workers of all trades and a commitment to freedom of speech. The most well-known of Martí's poems, "Los zapaticos de rosa/The little pink shoes," is a wonderful story of kindness about a young girl named Pilar.

Associate Professor Alejandro Rodriguez displays these poems on his faculty website, alongside a tapestry of other topics from optical physics, and Afro-Cuban music to comics and cartoons. This mélange represents the many facets of his identity as engineering professor and Cuban-American.

Rodriguez and his mother fled Castro's Cuba during the late 1990's. He attended high school in Miami, Florida, and it was there that he discovered his passion for academics, specifically physics. As an undergraduate at MIT, he pursued gravitational physics before discovering electromagnetics and optics through a chance encounter with a poster in MIT's Infinite Corridor. As a faculty member at Princeton, his research group studies mathematical and computational techniques that could one day lead to optical computers and enhancements in myriad other optical devices.

In his roles as research and academic advisor, he mentors students to build confidence by overcoming challenges. Rodriguez credits navigating so many challenging personal experiences while growing up with building his own confidence and resilience. Since academia can be very competitive, he mentors his students to try things until they find something they're very good at or naturally inclined towards. And, once they do that multiple times, they build determination, which emboldens them to push boundaries.

Below, Rodriguez tells stories of his personal challenges and how he overcame them to build resilience, confidence, and a sense of healthy competition—all the while maintaining a robust sense of humor.

Alejandro Rodriguez, Associate Professor of Electrical and Computer Engineering and Director of the Education Program MIRTHE+

Marbles in Cuba

I left Cuba at nearly 12 years old. Cuba is a very poor country, and I remember playing outside on the streets pretty much every day. Things were very hands on. At the playground, there would always be some kid who wanted to take my marbles. It was a formative experience. Kids would challenge me, and I didn't have my parents around. I built resilience and confidence knowing that I would not let anyone take my marbles from me—those were my marbles.

At a fundamental level, it's by experiencing and overcoming adversity in big and small ways that one develops a strong sense of self.

Right: The protagonist Pilar as depicted in José Martí's poem "Los zapaticos de rosa/The little pink shoes."

Chocolate and leaving Cuba

We came to the U.S. because Cuba had been under communist party rule for nearly 40 years. My stepfather was a college professor teaching solid-state physics. The Soviet Union had just disintegrated, and Cuba relied primarily on trade with them. The Cuban economy had been massively mismanaged and consequently the situation became dire.

People were protesting for change. A letter was circulating around the university asking for more open discussions and political diversity in the island, and my stepfather signed it. Because of that, they took my stepfather along with 60 other faculty members, to a tribunal, coercing them to reveal the author of the letter. But my stepfather refused to do that, so he was expelled from the university along with several others.

After that tragedy, he ended up working a couple of very low-paying jobs including a chocolate factory because the government assigned jobs. I remember him coming home with boots covered in chocolate, and my dog Dinka used to lick them clean. While I know dogs shouldn't be eating chocolate, I regard this as a fond memory of those times. My stepfather was an academic who was fired because of his political opinions, and because he wanted a more tolerant society. He left Cuba because he couldn't take it anymore. Soon after, my mother also decided to leave.

Ours is a typical story of the immigrant coming to the United States fleeing either poverty or political persecution. In my case, we were fleeing both.

When we got to the U.S., times were tough. My stepfather worked two and three jobs at a time until he found a job as an editor for a television station.

Remembering these circumstances, and I am only grateful for them. I don't think negatively about my life in Cuba or the adversities I faced when I arrived in the US. I am lucky and thankful to have been able to emigrate to the US—there are not many places in the world that would have afforded me the opportunities and freedoms I was given here. I am a very positive person even when things go wrong and don't expect life to work out the way I want all the time. Sometimes, you must figure out how to make situations work for you. I say, navigate within the constraints you are presented and always try to find a silver lining.

Ask yourself, what is driving you—what is propelling you in life? You must have some challenge to overcome, everybody does. Otherwise, life becomes too boring.

Finding physics and friendship in the U.S.

I became interested in academics around sophomore year in high school. Only then did I begin to learn about my stepfather's interests in science.

Rodriguez with pet dog Dinka.

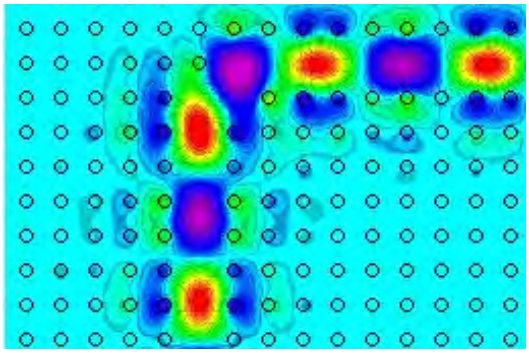
I remember one day coming home from school and saying to him, "hey, I just built a motor in my physics class and I really enjoyed it." I was fascinated by the idea that by studying physics one could amass knowledge that may be used to build something of utility while gaining a deep understanding of the foundations of our universe.

At the time of this realization, my class rank was in the high 200s out of a class of 1000 and out of a school population of nearly 5,500 students. I remember asking the career counselor "How do I become number one?"

My friend Melody said, "there's this really smart kid named Adrian who is currently the top student in our class, and you probably won't be able to beat him." So, being highly competitive, I went straight to Adrian proclaiming, "I promise I'm going to beat you. I'm going to be number one." Some of that competitive drive certainly comes from my struggles growing up in Cuba.

And, lo and behold, we both were number one. I kid you not—we finished high school with identical GPAs. There is even a picture of us playing chess in the high school newspaper celebrating us as co-valedictorians.

We both went to MIT and became college roommates. To this day, we remain close friends. While my competitive drive fueled me academically, it certainly wasn't at the expense of friendship and collegiality.



Left: Rodriguez with his co-advisors Steven G. Johnson and John Joannopoulos.
Right: Image of waveguide seen in MIT's Infinite Corridor.
Images provided by researcher.

A life-changing poster at MIT

I began research the summer after my first year at MIT. This story illustrates why one should never close doors unnecessarily, but rather seize every opportunity available to open new ones. Throughout my first year and early in the summer, I thought I wanted to study gravitational physics and cosmology. I also thought that optics was boring. Electromagnetism, or the study of light, seemed to be one of the most boring areas in physics, particularly because I had only been exposed to a small regime of optics known as ray optics, the physics of camera lenses and antennas.

So, I'm walking back through the Infinite Corridor at MIT, and was thinking that I wasn't really enjoying my research experience when I saw this amazing poster with beautiful pictures of light traveling through a waveguide. I remember thinking, "man that looks like a wave to me. And its trapped and bending in a way that seems really magical." So naturally, I knocked on the door of the principal investigator on the poster.

His name was John Joannopoulos, and he turned out to be an extremely well-known physicist working in the area of photonics. "Hey, I want to work with you." He replied, "well, what are you doing? What courses are you taking? What year are you in?" I replied, "I am a freshman, but I am taking quantum mechanics." Right then and there, he decided that we couldn't work together yet. He said, "I don't really have any project for you right now, you are too young. Maybe in a year or two you can come back, and we can find a suitable project."

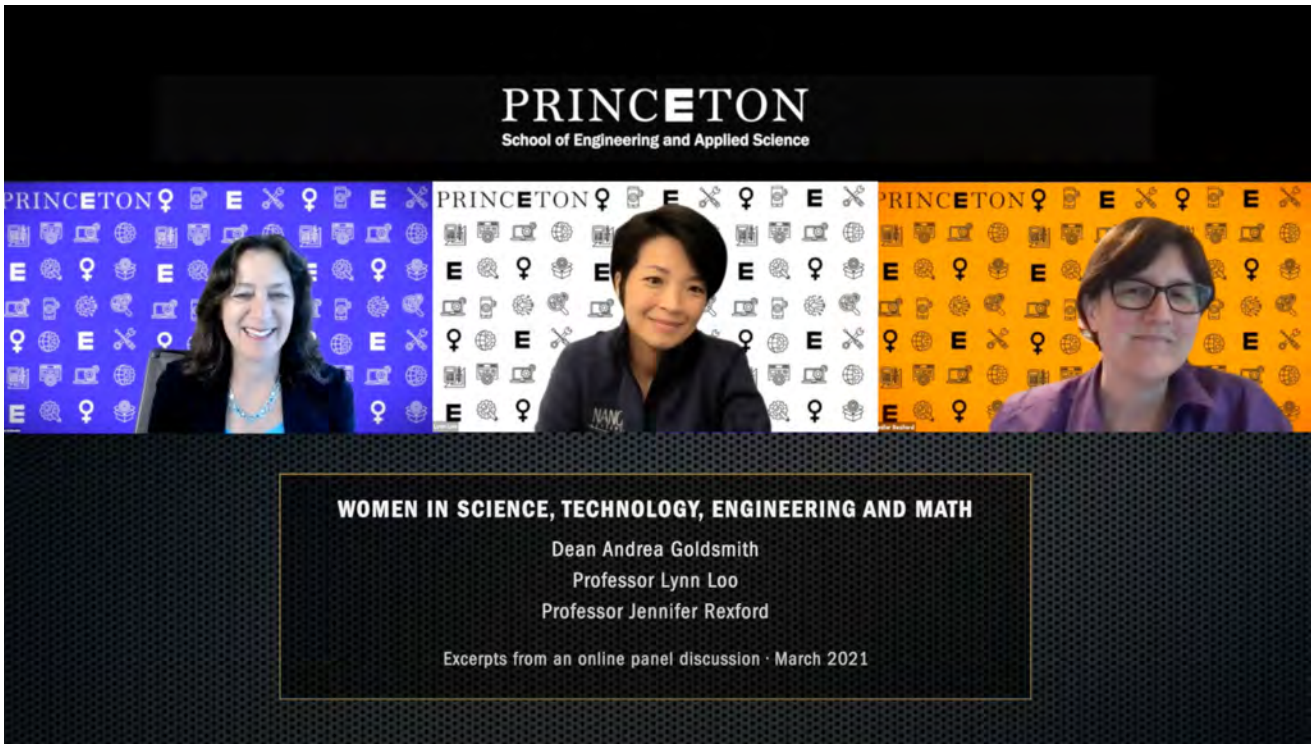
Having learned a thing or two about persistence, I came back and knocked on his door about three or four times throughout the summer. By the end of the summer, my constant visits had become a joke between us, but one day I get an email from him saying "hey, I think I have something for you, come by."

And, as it turns out, he introduced me to a young professor in the Department of Mathematics, Steven G. Johnson, and they both became my undergraduate thesis and Ph.D. co-advisors.

Humor, Cuban culture, and diversity

Cubans tend to be very loud, and we joke about everything. So, I was always used to humor as a way of disarming people and creating a bond. It's the way I grew up, having that sort of back and forth and not taking things too seriously. And if something negative happened to me, I learned to just laugh about it and move on. The use of comedy and humor is a very human response to alleviate pain and to diminish negative stigmas. It wasn't until college that I realized that not everyone responds the same way.

Despite coming from a diverse Hispanic population in Miami, college was the first time that I felt a culture shock upon being exposed to people from various backgrounds, cultures, and viewpoints. Some of the most meaningful conversations I had in college were with people with whom I seemed to have very little in common. Finding a shared humanity and common ground with someone that I believed had very different values from my own was really eye opening, which is why I think it's important for people to allow themselves to be challenged by situations and ideas, and not retreat into echo chambers. It's my experience that cultivating diverse viewpoints is a recipe for both scientific and interpersonal growth. (Continued on page 23)



Dean Andrea Goldsmith, Professor Lynn Loo, and Professor Jennifer Rexford served as panelists for the inagural Women's History Month event.

Women's History Month

by Steven Schultz

Imposter syndrome, bias, and a variety of other challenges factored strongly into the early careers of some of the most respected and high-impact leaders at Princeton Engineering. That was one of messages of a series of events marking Women's History Month in March in which women faculty described their early pathways and shared insights and excitement about their fields.

"My first year at Princeton I was certain I was going to be a statistic," said Jennifer Rexford, chair of the Department of Computer Science, the Gordon Y.S. Wu Professor in Engineering, and a 1991 graduate of the Princeton. "So many of my classmates seemed profoundly confident... they were starting problem sets the day before they were due and I was working on them all week. So I was really convinced my first year at Princeton I would not make it."

Rexford was speaking at an online event with Dean Andrea Goldsmith, the Arthur LeGrand Doty Professor of Electrical and Computer Engineering, and Lynn Loo, director of the Andlinger Center for Energy and the Environment and the Theodora D. '78 and William H. Walton III '74 Professor in Engineering. Like Goldsmith and Loo, Rexford went on to describe how she found friends and mentors who ultimately helped propel her into a successful career.

In a related conversation, Loo and Rexford joined associate professor Ning Lin of the Department of Civil and Environmental Engineering in discussing their pathways and offering advice to women in following generations. Also marking the month, Goldsmith delivered the closing address, on "Why Data Science Needs More Women," at the international Women in Data Science Conference.

ASIAN AMERICAN PACIFIC ISLANDER

HERITAGE MONTH

by Steven Schultz

In recognition of Asian American and Pacific Islander Heritage Month, Professors Aarti Gupta, Ruby Lee, and Yiguang Ju recently spoke about their academic paths into the academy and the importance of their heritage to their careers.

Princeton professor of computer science, **Aarti Gupta** is a leading researcher specializing in formal verification, advancing both the underlying theoretical foundations of the field and practical innovations to improve real-world systems. Gupta joined the Princeton faculty in 2015 as a full professor after a distinguished career at NEC Labs America, where she led a research team in systems analysis and verification. At NEC, her group contributed to the fundamental techniques of verification and helped in their successful deployment on large industrial software projects.

Yiguang Ju is Princeton's Robert Porter Patterson Professor of Mechanical and Aerospace Engineering and an expert in combustion, the science of fuels, flames and explosions. His research has contributed to scientists' fundamental understanding of how fuels burn and has advanced innovation in alternative fuels and combustion technologies for cutting carbon emissions in power and propulsion systems and low-carbon techniques for chemical manufacturing. His research has led to the recent discovery of plasma and ozone assisted cool flames and warm flames. He also investigates new nano-scale materials needed for batteries and other sustainable energy systems.

Ruby Lee, the Forrest G. Hamrick Professor in Engineering and professor of electrical and computer engineering, is a pioneer in the field of computer architecture, recently bringing together software, hardware and artificial intelligence to break new ground in cybersecurity. In joining the Princeton faculty in 1998, Lee also broke new ground, becoming the first woman appointed to an endowed chair professor in the school of engineering, and the first Asian American woman to have tenure at Princeton.

If there was something that you could clarify about people's perceptions of Asians in STEM, what would it be?

Professor Lee: Sometimes, it seems like Asian-Americans do not get as much credit as they deserve for what they have done. It may be because they are a bit shy, or not culturally inclined to self-promotion.We need to recognize and de-mystify the achievements of Asians.

Professor Gupta: People and the media often think that Asian-Americans in STEM do not like to have fun--or that the only fun they have has to do with math and science. I think of stereotypes of Indians, from movies or sitcoms.

The Big Bang Theory has the Indian astrophysicist who is socially awkward. The Dilbert cartoon has an engineering intern who is a graduate from IIT in India. But I feel that, for myself, as much as I love science, I also love the arts and theater. I was in a drama club in my undergrad and have been a subscriber at McCarter for more than thirty years.

Professor Ju: People have the perception, "You are an Asian guy, so you are good at math." I think the reason that Asian kids may be particularly good at STEM and math is because of their culture, the focus of their parents. The parents make many sacrifices in terms of time, in terms of money--it's not because their talent is more. The family spends a lot of time, and effort, and resources on education.

Another misconception is that people with Chinese heritage may not be loyal Americans. The China Initiative [a U.S. Department of Justice effort to combat espionage] is threatening. They are targeting us, and they say now that we may be spies of China. This is rather sad today. Because I am of Chinese origin, because I might have studied in Asia and taught at a University in Asia, then I become racially profiled. America is really great country. It has provided us a lot of opportunities, particularly that of equality and freedom. For example, I was able to get my first research grant from the Air Force and NASA, even though I was not yet an American citizen. I was really surprised, and I felt very appreciated.

If you're talking to a young person about your field right now, what would you say is exciting? What advice would you give?

Professor Lee: My research now is at the intersection of three areas: cybersecurity, computer architecture, and deep learning or artificial intelligence. I think that this is a really exciting time for people to get into these areas. For example, with the escalation of cyberattacks, improving cybersecurity is critical for all aspects of our daily lives, for commercial transactions and for national security.

Protecting our society and country will be more in the realm of cyber protection rather than physical protection. Also, after attacking the software and the networks for some time, attackers are now targeting the hardware foundations of computers, so it is really important to design future computer architectures to be secure and resilient.

And artificial intelligence is changing the world, so all future computers will have artificial intelligence built in, including for thwarting attackers.

I would say to future students, some people may know right away what they want to do. Other people may have many different interests. If the opportunities present themselves to you, you just have to pick one of them. Pick something you are really interested in or passionate about, and don't be afraid--just go for it!

Professor Gupta: I would say to a young person to acquire the technical knowledge and problem-solving skills in their favorite area of engineering and computing research, and also to learn about the social and ethical dimensions in their work. As engineers, we are drawn to building new things, but with the fast pace of technology driving society, there is a tremendous need for doing so responsibly and ethically at all levels.

Also, I would say that it is very exciting that we are in the midst of a digital information and communication revolution, where computing innovations are creating new products used by hundreds of millions of people in the world. Computing is also enabling new methods in many other disciplines, from engineering and natural sciences, to social sciences and the humanities. There are so many paths and opportunities for making intellectual and practical impact—it is a great time to be a computer scientist!

Professor Ju: One opportunity is in space propulsion. How do you make rockets that are efficient or reusable to go to Mars and beyond? How do you make fuel, convert the CO2, on the Mars surface into the fuel to allow the rocket to fly back?

The second thing I would say that there's huge opportunity in low-carbon energy conversion. Today more 80% of our combustion of fossil fuels is harming the future due to carbon emissions. Going forward, power generation will be shifted to hydrogen and ammonia as energy carriers.

Lastly, I think the kind of culture that focuses on education and family is so important. My parents and my grandma knew that the only thing to change you, particularly if you are at the bottom of society, is education. So no matter how poor you are, study hard and find the opportunity for yourself. That's the only thing. If you are at the bottom, that's the only thing to change your life.

New Faculty Q&A: Adji Bousso Dieng

by Molly Sharlach

Adji Bousso Dieng wants to create artificial intelligence that can understand the mechanisms underlying complex systems and have a level of control over their behavior — work that could impact fields including science, health care and automated systems.

Dieng was appointed to the faculty of Princeton's School of Engineering and Applied Science in October 2020 and starts her position in September 2021, becoming the first Black woman faculty member in the engineering school's 100-year history and the first Black faculty member in computer science.

"This shows how far we've come and how far we have to go," she said. "I'm hoping that things will change drastically and that we won't have to celebrate these things — it should be normalized."

A native of Senegal, Dieng holds a Diplôme d'Ingénieur from Télécom Paris and a master's degree in applied statistics from Cornell University. She earned a Ph.D. in statistics from Columbia University in May 2020, and is currently working as a research scientist in AI at Google. She has also worked at the World Bank, and interned at Weill Cornell Medical College, Microsoft Research, Facebook AI Research and DeepMind. After completing her Ph.D. last year, Dieng founded a nonprofit called The Africa I Know, which seeks to change narratives about African history, knowledge and innovation to inspire and empower young Africans — and to provide them with opportunities to pursue careers in STEM (science, technology, engineering and mathematics).

Here, Dieng shares her research vision, her educational background, and her perspectives on breaking barriers as a Black woman in academia and STEM.

Q. What has been your research focus, and how do you hope to expand on this at Princeton?

A. I work on probabilistic modeling, an approach to AI that allows you to incorporate uncertainty and domain knowledge when learning about the structure underlying complex systems for understanding and decision-making. Key to probabilistic modeling is the ability to come up with an interpretable generative process for data — meaning, thinking about the mechanisms by which data came to be. My Ph.D. thesis was about making this process more flexible, and flexibility is what deep learning is about. Deep learning allows you to extract structure from data for prediction purposes using neural networks.

Adji Bousso Dieng, assistant professor of computer science.

My thesis was about taking ideas from deep learning and bringing them into probabilistic modeling, so that you can account for interpretability, uncertainty and domain knowledge while enjoying flexibility when learning about complex systems.

So far, I have applied this to computer vision and language. At Princeton, I am looking to push on the domain knowledge side of probabilistic modeling — giving more power to what humans want out of AI systems in domains such as health care and the sciences. If we want to be able to apply our models and algorithms in those domains, we'll need to take great care to ensure we understand and trust their behavior.

This agenda will require collaboration with scientists, with people working on health care and biology. And we can also imagine constraints arising from societal considerations like fairness and privacy, so that will involve collaboration with people from the Center for Information Technology Policy. That's the vision for what I want my lab to be: a multidisciplinary lab where we will leverage probabilistic modeling to think about how to incorporate desiderata and constraints stemming from domain knowledge into AI systems.

Q. Can you share a bit about your background and how you got into your field?

A. I grew up in Kaolack, Senegal, which is a region in the center, about three hours from Dakar. I was lucky to be sent to school, because my dad didn't go to school and my mom didn't finish high school, but she understood that it's good for kids to have an education.

I was good at subjects like math and physics, but I didn't know what I could do with them beyond school — until I met Cheick Modibo Diarra. He was the first African to work at NASA as an astrophysicist, and he started the Pathfinder Foundation for Education and Development. The foundation organized summer camps that gathered the three girls with the best grades from [about a dozen countries in West and North Africa], so I participated in that and met him. That was the first time I had met an African who was successful in doing impactful things using mathematics and the sciences. So, I wanted to be an astrophysicist — later I figured out that I actually loved math and computer science.

After high school I received a scholarship from the Senegalese government and also won a scholarship that was funded by the foundation, and I decided to go to France. They have an education system that's very rigorous and also familiar, because in Senegal we have a similar system. I studied mathematics and engineering — that's where I learned programming and computer science, including algorithms, data structures and all of that.

I love computer science because it lets you actually build and see things working that have applicability to the real world. Using computing and data to build tools that help you understand the world — I think that's very empowering.

Q. What led you to continue your education and pursue your career in the United States?

A. I was seeing all these success stories of people who immigrated to America, and it seemed like there were no glass ceilings. I've heard Joe Biden mention that he summarizes America with one word: possibilities. I totally agree with that. There are so many opportunities in this country and the possibilities are limitless. That was very attractive to me, in addition to the quality of education and research.

Q. Why did you choose to join the Princeton faculty, and what are you looking forward to?

A. I'm excited about starting my own lab and doing research that I care about, and the Princeton context is all the more exciting because of its history with innovation and scientists breaking new ground.

Also significant is Princeton's history with racial questions. There was a time when if you were Black you were not allowed to even be a student, if you were a woman you were not even allowed to enroll as a student or be on the faculty. So, I think we've come a long way, especially given the recent events where there's been more reckoning about racial issues happening across the world.

Joining Princeton is a highlight for me because those issues are real, and they happen in academia, because it took 100 years for a Black woman to be appointed as a faculty member in the engineering school. That shows there is a lot more progress left to be made. Now that one barrier is broken, people who look like me can say, "She did it, so I can do it now." It's meaningful to me that I get to start my academic career at Princeton because of that history. I'm hoping that things will change drastically and that we won't have to celebrate these things — it should be normalized.

Q. Can you tell us a bit about The Africa I Know and your goals for the project?

A. The Africa I Know is a nonprofit organization with two main goals. It provides a publication platform (theafricaiknow.org) for showcasing African capability and contributions to knowledge and innovation to inspire and empower young Africans. The second goal is to provide resources and opportunities to young Africans to pursue education and endeavors in the areas of science, technology, engineering and mathematics.

The site *theafricaiknow.org* also has articles on African history. Again, the idea is to showcase historically Africa's position in the world and its contributions to many of these domains [including women's rights and higher education] that are often attributed to people not in Africa. We want to rewrite the history from our perspective, and not the perspective of what we read, which is often negatively biased towards Africa.

Student-sponsored conference inspires high school women in science and engineering

by Amelia Herb

Princeton University students in Graduate Women in Science and Engineering (GWiSE) joined colleagues at New York University to co-sponsor the 10th annual New York City Girls Computer Science and Engineering Conference.

"Research is all about ideas and creativity. That's what's going to make a difference in your career," said Caroline Jahn post-doctoral associate in the lab of Princeton University neuroscientist Timothy Buschman.

She and the other event organizers underscored the value that diversity brings to STEM, and that women in particular are essential to the vitality of computer science.

In order for the women to succeed, Jahn advocated that they "acquire hard skills such as coding, know your math, have all of these tools. But also you should cultivate your creativity, put yourself in novel situations, That is what will enable you to adapt to new technologies."

The event brought together high school students from 9th and 10th grade and their teachers to participate in the workshop and talks.

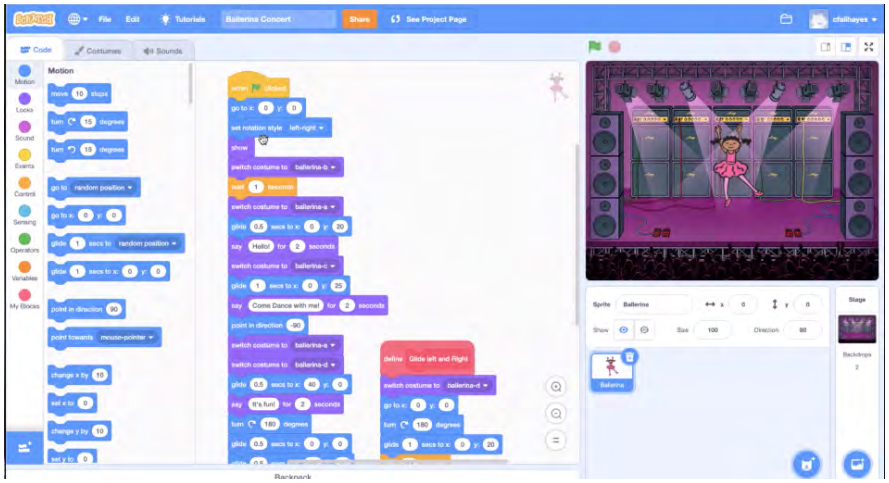
The conference was coordinated by GWiSE and New York University Women in Computing. The event opened with talks providing overviews of computer science and engineering fields, as well as an engineering project talk. The attendees then participated in a programming workshop and a Q&A panel about college admissions, scholarships, and careers.

The programming workshop used Scratch, an online program originally developed for users ages 8 to 16 as an educational tool to teach coding. Since its launch in 2007 the free website has reached millions of users and is supported by the Scratch Foundation, a non-profit organization that promotes access to coding programs for kids. During the workshop, participants and their teachers created animations to share with workshop participants, showcasing their creativity.

During the Q&A, students asked how can girls prepare for an ever-evolving career in computer science and engineering.

“We are happy to bring diversity to computer science and a global community because we think computer science and engineering are really important and powerful in solving a lot of the world’s problems,” Sana Odeh, organizer of the event and Clinical Professor and Faculty Liaison for Global Programs of Computer Science at Courant Institute of Mathematical Sciences at New York University, said in her opening address April 23 at the Zoom conference to an audience of 112. “Many of the jobs of the future will be related to computer science and engineering, so it is important that we are savvy and using the technology for good, producing innovative solutions and using tech for good.”

Princeton GWiSE is a community of graduate students advocating for inclusion and gender eqiality in STEM.



Right: 10th Annual New York City Girls Computer Science and Engineering Conference coordinated by Princeton's Graduate Women in Science and Engineering (GWISE) and New York University (NYU) Women in Computing (WiNC). Students participated in a coding workshop to create animations like the one on the right in the the platform Spark.

Sofia Quinodoz, postdoctoral researcher in the Soft Living Matter Group in the Howard Hughes Medical Institute.

HHMI Names Postdoctoral Researcher Sofia Quinodoz Hanna Gray Fellow

by Scott Lyon

The Howard Hughes Medical Institute (HHMI) has named Princeton postdoctoral researcher Sofia Quinodoz a 2020 Hanna Gray Fellow, bolstering her study into how the structures within cells contribute to disease.

Quinodoz will receive up to $1.4 million over the next eight years, funding her bioengineering research at Princeton and granting her startup funds for an unspecified future role as a principal investigator. The fellowship also connects her to a growing network of diverse, early-career researchers who are tackling the most urgent problems in the life sciences.

The 2020 cohort, announced on Feb. 18, includes 21 scholars from 18 institutions.

"Sofi is an absolutely fantastic scientist who is already having a major impact in my laboratory," said her advisor Cliff Brangwynne, the June K. Wu '92 Professor of Chemical and Biological Engineering. "It's no surprise that she is being honored with the most prestigious fellowship in the life sciences. The Hanna Gray fellowship adds rocket fuel to Sofi's already impressive trajectory."

The Hanna H. Gray Fellows program supports researchers from underrepresented groups who have the potential to become academic leaders. The support comes at a critical time in these scientists' careers — the transition from student to postdoctoral researcher to principal investigator — often seen as a bottleneck in the academic pipeline. As of 2021, HHMI has committed over $100 million to increasing diversity in academia, including a total 64 Hanna Gray Fellows so far, according to the announcement.

For Quinodoz, who earned her bachelor's degree in molecular biology at Princeton in 2013, the HHMI investment will allow her to pursue critical research into the organization of genetic material within the nucleus of a cell.

With HHMI's support, she also looks forward to becoming a role model for future Hispanic women interested in the life sciences, as well as young researchers more broadly. "Obviously, you don't need a role model who looks like you to do something important," she said. "But it helps."

Taishi Nakase, 2021 valedictorian and first-generation college graduate.

Valedictorian cites mentorship as key to his success

by Emily Aronson, Office of Communications

Taishi Nakase, an operations research and financial engineering concentrator from Melbourne, Australia, was valedictorian of Princeton's Class of 2021.

Taishi Nakase plans to become a doctor and is interested in using mathematical modeling to confront global health challenges. After Princeton, he will pursue a master of science in modeling for global health at Oxford University before attending medical school.

"I was drawn to the program at Oxford because of its focus on mathematical modeling as a way of confronting challenges in global health," Nakase said. "My research focus will be on the modeling of infectious diseases, particularly measles, in developing countries."

Nakase is the first in his family to attend college. He credited the mentorship of Princeton faculty and research experiences through the Global Health Program with supporting his studies and inspiring his career path.

"Professor Bryan Grenfell introduced me to the world of infectious diseases and encouraged me as a first-generation college student to pursue my interests in the field," Nakase said. Grenfell is the Kathryn Briger and Sarah Fenton Professor of Ecology and Evolutionary Biology and Public Affairs. "He has also tirelessly supported me in my independent work in infectious diseases by providing valuable insights and finding the time to help me think through the problems."

Nakase's senior thesis examines the modern challenges of measles control in Vietnam, modeling vaccination campaigns under limited health care resources in the country. Through Princeton's Global Health Program, he interned with Dr. Marc Choisy at the Oxford University Research Clinic in Hanoi. Nakase continues to work with Choisy remotely on research modeling measles dynamics in Vietnam.

"My global health internship was a transformative experience," he said. "It inspired a passion for the modeling of infectious diseases and encouraged me to pursue questions in global health."

The course "Mathematical Modeling in Biology and Medicine," taught by Associate Professor of Ecology and Evolutionary Biology Corina Tarnita, also had a profound influence.

Nakase, said Bill Massey, the Edwin S. Wilsey Professor of Operations Research and Financial Engineering, was a valuable mentor and teacher. "Professor Massey was incredibly approachable and always delighted to spend time discussing his material with me," he said.

Before attending Oxford in the fall, Nakase will study the persistence of measles in the developed world with Grenfell and Jessica Metcalf, associate professor of ecology and evolutionary biology and public affairs. In previous summers, he has been a trauma surgery research intern at the Wake Forest School of Medicine and a summer analyst at Rogers Investment Advisors in Tokyo.

While at Princeton, Nakase received the Class of 1939 Princeton Scholar Award and was twice awarded the Shapiro Prize for Academic Excellence. He is a member of the Phi Beta Kappa society and the Tau Beta Pi Engineering Honor Society.

In addition to his ORFE concentration, Nakase earned a certificate in computing. He was a member of Mathey College, as well as a teaching assistant for courses in ORFE, computer science and chemistry, and a mentor to incoming engineering students.

In recollecting his undergraduate experience, Nakase said the COVID-19 pandemic has put into perspective how special a place Princeton is. "Last spring, amidst devastating loss and the upheaval of our studies and life, I came to reflect on how important the conversations with friends, whether in dining halls or in in-person discussions, were to our college life," he said. "Hence, I am very grateful for the work of the University to bring us all together once again for this year's Commencement on campus. To celebrate the joys and triumphs of our time at Princeton, especially our perseverance through the disruptions of this past year, with our classmates is truly special and a privilege for all of us who called Princeton home for the last four years."

Claire Wayner, civil and environmental engineering concentrator was a awarded a 2021 Truman Scholarship

Claire Wayner earns Truman Scholarship

by the Office of Communications

Claire Wayner, of Baltimore, Maryland, is a civil and environmental engineering concentrator pursuing certificates in environmental studies and sustainable energy. She was one Princeton recipient of a Truman scholarship, providing up to $30,000 toward graduate school and professional development opportunities to prepare for careers in public service. She will pursue an M.P.A. in energy policy and work toward decarbonizing electric grids through sound policy and regulation.

"Claire is a smart, thoughtful, mature young woman with a passion for environmental problem solving and a desire to be a difference maker," said Eric Larson, senior research engineer at the Andlinger Center for Energy and the Environment and a lead researcher of Princeton's Net-Zero America study. "She is intellectually curious, creative and strongly motivated to pursue a career in sustainable energy. She certainly has the potential to grow to be a leader in this field."

Wayner conducted research with Larson as part of the Net-Zero America Project, which aims to design decarbonization pathways for the United States by 2050. She works for Princeton's Office of Sustainability and has interned at the National Renewable Energy Laboratory and the Federal Energy Regulatory Commission.

Wayner is a recipient of Princeton's George B. Wood Legacy Sophomore Prize, awarded each year to members of the junior class recognizing exceptional academic achievement during sophomore year, and the Shapiro Prize for Academic Excellence. She also was named a Udall Scholar and a Scholars in the Nation's Service Initiative Omenn Darling Fellow.

A member of Forbes College, Wayner is co-founder of the Princeton Birding Society and also has served as president of the Princeton Student Climate Initiative, sustainability chair of the Undergraduate Student Government and an opinion columnist for the Daily Princetonian.

The Truman Scholarship Foundation was established by Congress in 1975 as the federal memorial to the 33rd president.

(Photo credit Sameer A. Khan/Fotobuddy)

Princeton Society of Women Engineers host Girl Scout Badge Workshop

by Amelia Herb

The Society of Women Engineers held its annual spring Girl Scout Day across two sessions on April 20th and 27th. The semesterly badge workshop for Girl Scouts introduces girls to science and engineering.

This spring, due to Princeton University's COVID-19 restrictions, the badge workshops for Brownie Girl Scouts in second and third grades were held online.

The Girl Scout Day committee, consisting of seven SWE members, planned and facilitated activities to help local New Jersey Brownie scouts earn their "Senses" badge.

Each activity highlighted one of the five senses: identifying man-made versus natural objects outside of their window (sight), writing down sounds they hear in their house (hearing), smelling various foods while blindfolded (smell), identifying different flavors (taste), and writing their name in Braille using Elmer's glue (touch).

Despite the challenges of holding a workshop in a virtual environment, the scouts came engaged and excited, and they successfully earned their "Senses" badges!

Keller Center Starts Program in Historical Racism in Engineering

The Keller Center for Innovation in Engineering Education is introducing a new program in Institutional and Historical Racism in Engineering, Technology, and Innovation open to Engineering faculty and staff. This year-long program aims to empower its participants to identify the impacts of systemic racism and develop structural solutions within the participants' areas of influence. The program, which runs from September 2021 to May 2022, encompasses education on institutional and historical racism, community, and support towards action. It will consist of workshops, videos, podcasts, guided small group conversations, and will culminate in an action project.

Applications are currently being accepted.
Please follow the link below to apply.
Institutional and Historical Racism in Engineering, Technology, and Innovation

Keller Center Director, Naveen Verma, said that the purpose of the program was to "understand and rectify how racial inequity is intertwined in the societal structures that exist today—this requires digging-in really deliberately and carefully. Otherwise, the inequity is simply going to grow."

He feels that there are three crucial steps that Princeton must take on these issues. "Princeton is creating the next-generation of innovators, so we need to understand the factors that lead to racial inequity on fundamental levels. We need to come together to comprehend all the ways they affect us and our community, and we need to take actions to counteract them."

Although he acknowledges that "this will be new to many of us—the Keller Center program is about supporting Princeton students, faculty, and staff in this important endeavor to ensure racial equality."

New Masters of Engineering Degree Programs Piloted

The Masters of Engineering (M. Eng) pilot program is a one-year degree program following a bachelor's degree. Five departments in Engineering are offering the program: Electrical and Computer Engineering, Mechanical Engineering, Operations Research and Financial Engineering, and Civil and Environmental Engineering, and Chemical and Biological Engineering. At the close of the enrollment period, 63 students were accepted and enrolled.

"The program allows students depth within the area of their major, as well as provides more breadth in a field than is common to undergraduate degrees," said Dean Andrea Goldsmith.

This is a coursework-only program based on a full-time academic load over two semesters; no thesis or research is involved. Students can choose courses that are currently in the curriculum at the advanced undergraduate level or graduate level.

While the program can also serve as a gateway into a doctoral program, students have the flexibility to leave with the terminal degree and enter the workforce at a higher level than with solely an undergraduate degree.

The program is tuition-free for the classes of 2020 and 2021 and provides some relief to graduating seniors during this year of COVID-19. Departments will decide at a later date whether the degree programs will be extended for the academic year 2022/2023.

Dean Goldsmith is pleased that the programs were put in place so quickly. "I am so grateful to all the people that made it happen, " she said. "In the midst of COVID and all the other challenges we had this year, starting a completely new program with all its complexity was a Herculean task. Many people stepped up to make it happen. she said. "I'm really excited we can offer this compelling degree program to our current seniors as well as the Class of 2020 graduates, and I look forward to welcoming the students in the fall." The program had 63 students enroll.

For further information about individual department programs, please follow the link below.

https://gradschool.princeton.edu/degree-options/meng

Early engagement of young scholars is critical to motivating learners who will become tomorrow's engineers and computer scientists. SEAS launched several programs to engage young learners in STEM (science, technology, engineering and math) develop research skills and explore the opportunities available to them in engineering and computer science.

Applying to Graduate School?

If you are an undergraduate student planning to apply for graduate programs in STEM, you can avail yourself of the resources created by the SEAS Diversity & Inclusion team to help you navigate the academic graduate application process.

The video series addresses a range of topics including:

- Paths to an Engineering Career
- Application Process
- Letters of Recommendation
- Statement of Purpose
- What's In a Number
- Fellowships 101

Please reach out to the Diversity & Inclusion team for additional support *julieyun@princeton.edu*

Princeton-Intel Summer Research Experience for Undergraduates (REU)

Electrical and Computer Engineering and Diversity and Inclusion

Princeton University's Department of Electrical and Computer Engineering partnered with Intel to start a summer research program for rising college juniors focused on gaining research experience in computer security. Five students were chosen from around the country to spend eight weeks this summer conducting computer security research under the guidance and mentorship of a Princeton faculty member with active mentoring from Intel researchers and career mentors.

Pathways to Graduate School

Pathways to Graduate School (PGS) Program

We accepted applications for the Pathways into Graduate School (PGS) program, a SEAS program designed to mentor high-potential rising seniors in college, including those from traditionally underrepresented groups, who are interested in pursuing graduate education in preparation for careers in engineering and computer science.

The program is organized as a summer intensive, which kicked off on **August 13, 2021,** followed by monthly workshops through the fall semester. It will prepare students for the rigors of graduate school and mentor them through the application process. This year, we have modified our on-campus program to be held online in response to COVID-19.

Read more about the program at
https://engineering.princeton.edu/graduate-studies/academic-pathways/prospective-graduate-students

Please reach out if you have any questions about the program *julieyun@princeton.edu.*

Postdoctoral Success Program

Diversity and Inclusion Postdoctoral Fellow

The Office of Diversity and Inclusion seeks to support our early-career researchers and optimize the experience of all postdoctoral scholars. To that end, the Postdoctoral Success Program (PDSP) will provide support, mentoring, and advocacy for the engineering postdoctoral and research associate community. We aspire to make your time in the School of Engineering and Applied Sciences professionally rewarding.

Postdocs are supported in broadening their professional development by participating in workshops, discussion groups, social events, and networking events. We will also facilitate new postdoc orientation in the fall.

César Carrasco-López, an associate research scholar in the Department of Chemical and Biological Engineering will serve as a Diversity Fellow supporting the Engineering post-doctoral community.

Sept 21 from 12-1 PM
We will discuss key elements for promoting success in STEM. Participants are encouraged to read the *Nature* article "Go Beyond Bias Training" prior to the event. César Carrasco-López and Associate Dean Julie Yun will moderate.

Navigating the A, B, SEAS of Graduate School

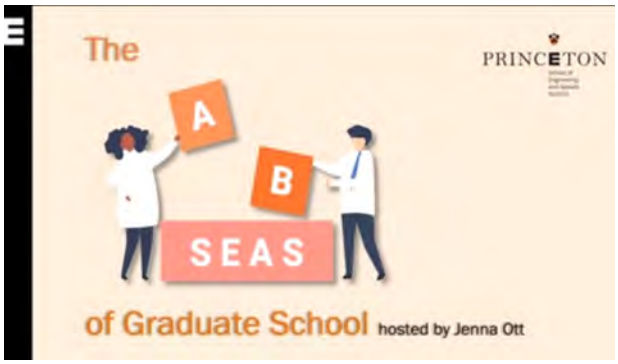
Diversity and Inclusion Graduate Fellow

CBE graduate student Jenna Ott became a SEAS Diversity Fellow in 2019.

In this role, her goals were twofold—first to help incoming graduate students navigate the process of applying and second to demystify certain academic milestones such as generals exams for current graduate students.

To meet these aims, she has created a series of videos on the following topics:

CBE Generals Exams
Q&A: Basics of Graduate School
Q&A: Graduate Application Process
Q&A: Engineering Career
Why should I consider graduate school?
What is graduate school?



Pathways into the Academy

Princeton's School of Engineering and Applied Science invites applications of advanced Ph.D. students and postdoctoral fellows interested in academic careers to apply to Pathways into the Academy (PPIA). PPIA is a year-long career development program preparing early-stage researchers for faculty careers in engineering and computer science. The program offers structured support that supplements the guidance graduate students and postdoctoral fellows already receive from their advisors.

The program combines faculty-led panels with monthly training and check-ins for ongoing mentorship and guidance to support participants in launching academic careers, from the search processes to navigating lives as junior faculty. Because of COVID-19, all programming will be conducted online again this year.

PPIA will run from November 2021 to November 2022. Please feel free to share this announcement with faculty colleagues, advanced graduate students, and first-year postdoctoral fellows.

You may read more about our program here: https://engineering.princeton.edu/graduate-studies/academic-pathways/prospective-faculty.

Please reach out to *julieyun@princeton.edu* if you have any questions or to nominate a student or postdoctoral fellow.

Diversity and Inclusion Events Calendar

Coffee Chats are back! Meet up in the EQuad Café for an informal chat with colleagues and friends! Join us:

Wednesday Sept 8 9:00 AM – 10:00 AM
Tuesday Sept 28 9:00 AM – 10:00 AM

Keep an eye out in the fall for more events. Also visit the following pages for programs and services campus wide.

Central Office of Diversity and Inclusion

Princeton Health Services (McCosh)

SEAS Diversity and Inclusion

University Counseling and Psychological Services

Finding Ourselves and Finding Community

SEAS Graduate Student Wellness Series

A new program conducted by Sue Kim, "Finding Ourselves and Finding Community" provided a cohort of students with an opportunity to explore and share the challenges of being a Princeton graduate student.

As a group, the students explored the issues that many graduate students face, including challenges with identity and self-worth, impostor syndrome, stress, work-life balance, and finding community. Through this exploration, the students gained insight and built skills enabling them to thrive and more effectively manage the stress and trials of graduate student life.

Participants were asked to commit to attending all four sessions to cultivate a cohesive and intimate group environment that enabled honest dialogue on challenging topics.

Dates (all times are EST):

- Session 1, Tuesday, June 8th at Noon: Defining Who We Are Beyond Our Graduate Student Identity
- Session 2, Tuesday, June 15th at Noon: What's Getting in Our Way Part I: Managing the Inner Critic
- Session 3, Tuesday, June 22nd at Noon: What's Getting in Our Way Part II: Systems and Culture
- Session 4, Tuesday, June 29th at Noon: Finding Balance and Building Community for Support and Healing

Students received a book of their choice from the following list when they registered for the program.

- Mindful of Race by Ruth King
- How to Live by Thich Nhat Hanh
- Daring Greatly by Brene Brown
- Self Compassion by Kristin Neff
- Laziness Does Not Exist by Devon Price

Facilitated by Sue Kim, LSW, Counseling and Psychological Services and TigerWell Outreach Counselor. Please contact Sue Kim at sk38@gmail.com with any questions or concerns.

Sponsored by SEAS Office of Diversity and Inclusion, Counseling and Psychological Services, and TigerWell

Top row: Raphael Njoku, Bennett Holmes, Taj-Jahnae **Middle row:** Jayla Cornelius, Andrew Paul, Tadiyos Berhane, Jafar Howe **Bottom row:** Larry Zebaze, Naomi Oke, Lindsey Moore

NSBE

National Society of Black Engineers

Princeton's chapter of the National Society of Black Engineers has the primary goal of connecting Black students to build a community centered around professional development, networking, and exploring personal interests.

We make it our goal to aid in the development of our members by providing them with mentors, career development resources, and more. Some of our most engaging events include Pset and Chill nights where students get together to study, to hear from alumni about their Princeton experiences, and to hear from representatives of companies about applications and resume writing.

In this upcoming fall semester 2021, we plan to have some exciting new initiatives centered even more around building a sense of community amongst Princeton's black engineering student population.

If any students are interested in hearing more about any upcoming events and/or ways to get more involved with the organization, please make sure to sign up to NSBE's listserv and reach out to ***nsbepu@princeton.edu*** with any questions!

We are so excited to hear more from students and help them throughout their collegiate journey!

GWiSE

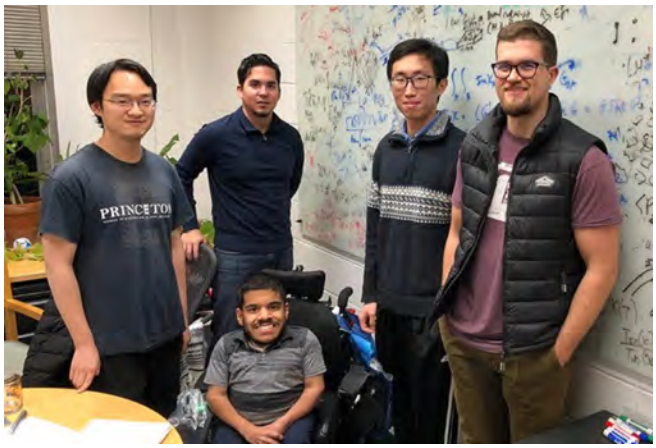
Princeton Graduate Women in Science & Engineering

GWiSE is a community of graduate students who advocate for inclusion and gender equality in STEM fields at Princeton and beyond.

We connect graduate women through professional development and social events, invite speakers to campus to discuss inclusion and diversity across the sciences, and participate in outreach programs that encourage young people, particularly young women, to follow their scientific and engineering passions.

Check out our website:
https://scholar.princeton.edu/gwise/home

To learn more about us email *gwise@princeton.edu* if you have any questions or are interested in getting involved!



Rodriguez with graduate students Weiliang Jin, Prashanth Venkataram, Pengning Chao, and postdoctoral researcher Sean Molesky.

This is one of the aspects of my undergraduate experience that I value most and believe that all universities must continue to offer their students.

Since my undergraduate days, I've been involved in efforts and programs that provide outreach and mentorship to increase awareness and participation of underrepresented minorities in science, including the MIT Office of Outreach Programs and the Harvard and Princeton chapters of the Society of Hispanic Engineers. But even though ethnic and cultural diversity enrich campuses in many ways, the most important dimension of this aspect of a university is that of bringing people of different perspectives together and providing an intellectual space for engaging in vigorous debate. It is why I became a founding member of the Academic Freedom Alliance, a consortium of faculty from different backgrounds, disciplines, and political orientations, united under a shared commitment to academic freedom and viewpoint diversity.

To quote a lyric from the song "La Vida Es Un Carnaval/Life is a Carnival," written by the famous Cuban songwriter Celia Cruz, "Ay! There's no need to cry, because life is a carnival and it's better to live singing." And indeed, if life has taught me anything, it's that if people learn to approach uncomfortable or challenging situations, however they may present themselves, with some humor, good will, openness, curiosity, and some Afro-Cuban music, they can grow in unexpected ways and find themselves dancing to surprisingly new beats.

DIVERSITY MATTERS

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Note on Alumni class years
Following Princeton University convention, undergraduate alumni are indicated by an apostrophe and class year; graduate alumni, whether master's or doctoral, are indicated with a star and class year.

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