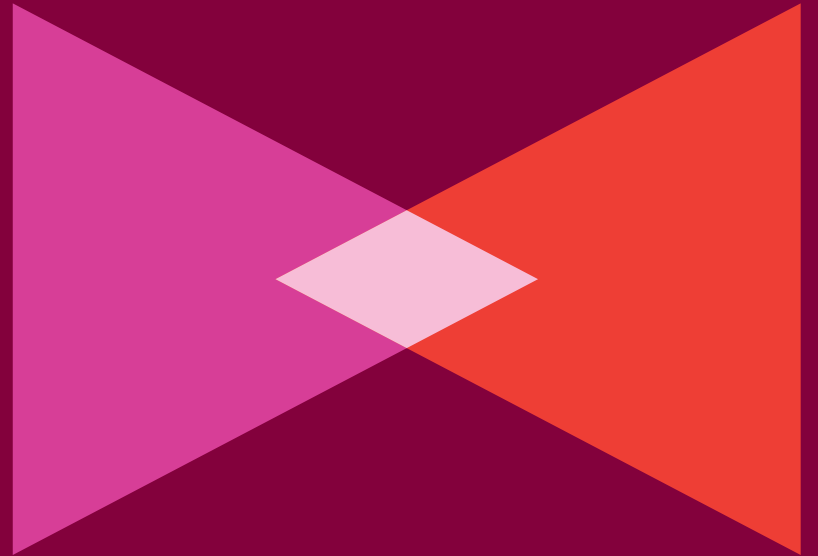
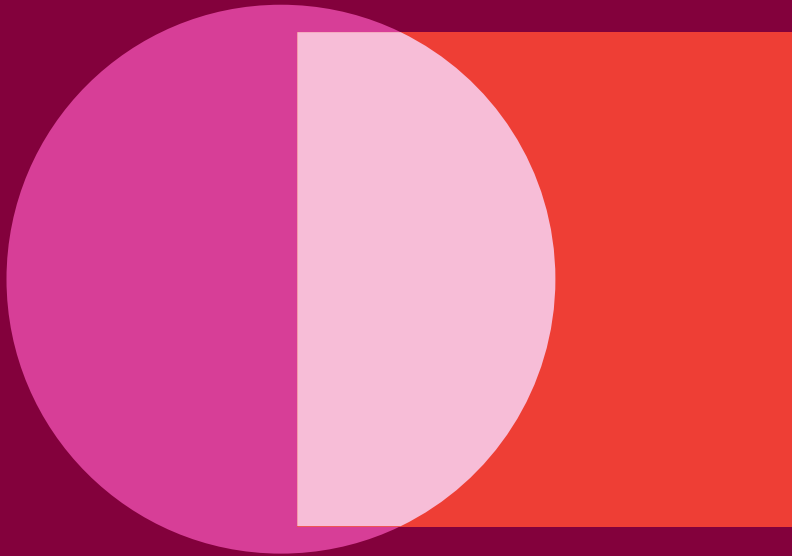


# Spectrum



**mentorship at mit**

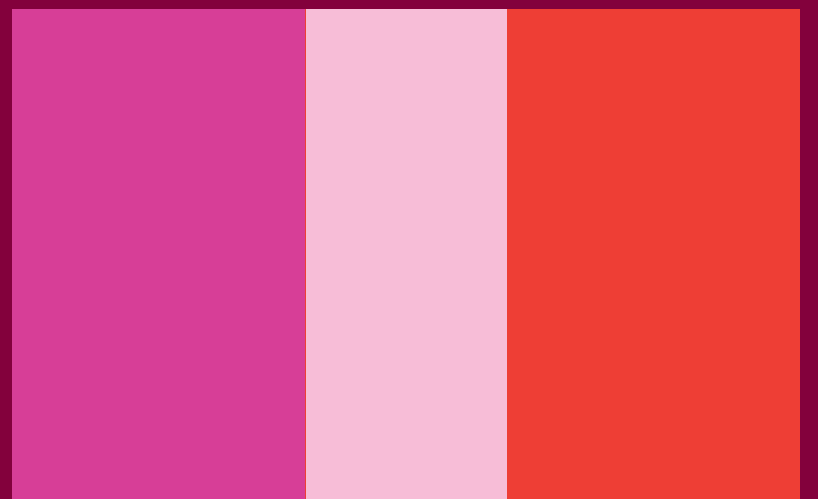
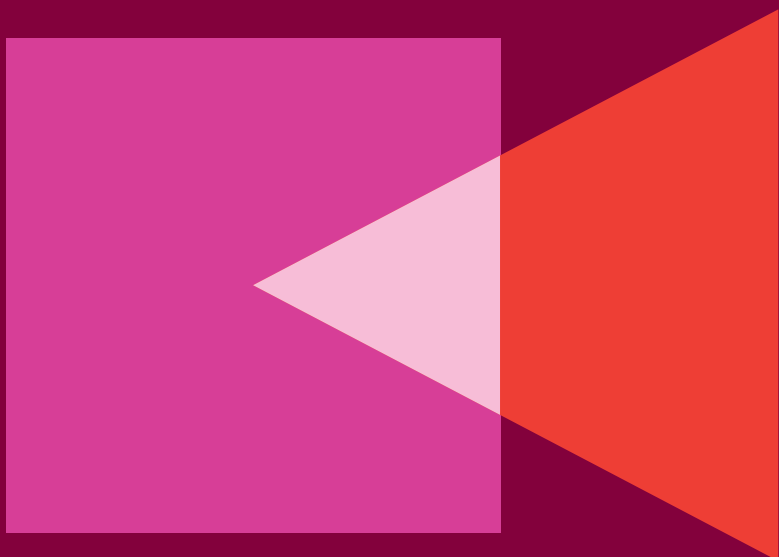
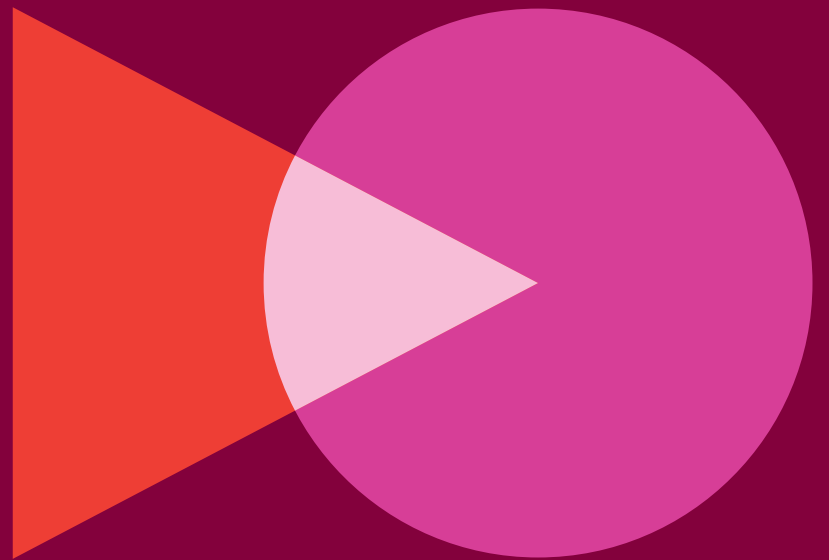
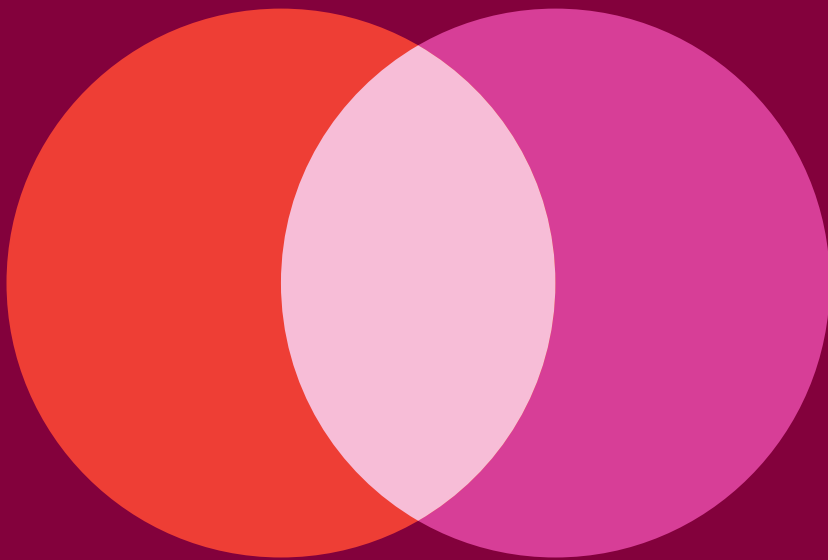




PHOTO: SARAH BASTILLE PHOTOGRAPHY

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## TWO DECADES OF J-PAL

More than half a billion people across the globe have been reached by programs and policies informed by insights from researchers affiliated with the Jameel Poverty Action Lab over the past 20 years. Learn more on page 26.

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## PEERS GUIDING PEERS

“MIT is a beautiful but challenging place, especially for first-year students,” says Anas Chentouf ’24, a resident peer mentor in Maseeh Hall. “Fortunately, MIT has a lot of resources, but also — unfortunately — MIT has a lot of resources. Resident peer mentors can help you find your way.” Learn more on page 8.

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The Office of Resource Development gratefully acknowledges the leadership of the MIT Corporation.

Throughout my academic and professional career, I've had incredible mentors. The professor whose brilliant teaching inspired me to pursue the life sciences. My PhD mentor, who was a man of few words, yet taught us all how to get along by his example. The medical school dean who saw my potential and offered me a leadership role — my first.

When it's done well, mentorship is a two-way street. At a place like MIT, mentors are likely to spend as much time learning from their mentees as dispensing pearls of wisdom.

This issue of *Spectrum* features some of the Institute's outstanding mentors. Finding the right mentor isn't always easy, so the issue also looks at the MIT programs designed to help students meet their perfect match.

We all know that on a tough journey — academic, professional, or personal — a trusted guide can make all the difference. So I'd like to take this moment to express my appreciation for the time and dedication so many of you contribute to the Institute's culture of mentorship.

Sincerely,  
Sally Kornbluth



(↗)  
LISTEN

The *Curiosity Unbounded* podcast brings you behind the scenes at MIT through conversations between President Sally Kornbluth and the people working in its labs and in the field.

[news.mit.edu/podcasts/curiosity-unbounded](http://news.mit.edu/podcasts/curiosity-unbounded)



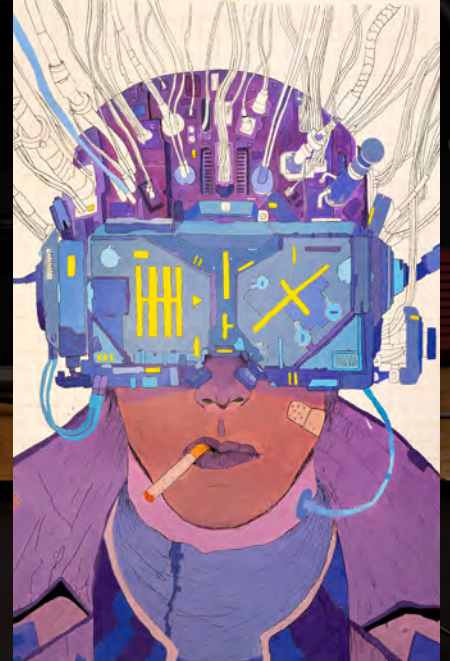


Chosen by the residents of 41 West, the *Anarchy* mural and the walls of the surrounding lounge were “repainted every year with black paint and became a new canvas for the year’s residents, including newly admitted first-years,” says Rachel Dzwonkowski '26, a member of the East Campus Transition Team, which worked closely with the Division of Student Life and project architects. The beloved mural was in the lounge (lit only by black light) used for most of the community’s social events.

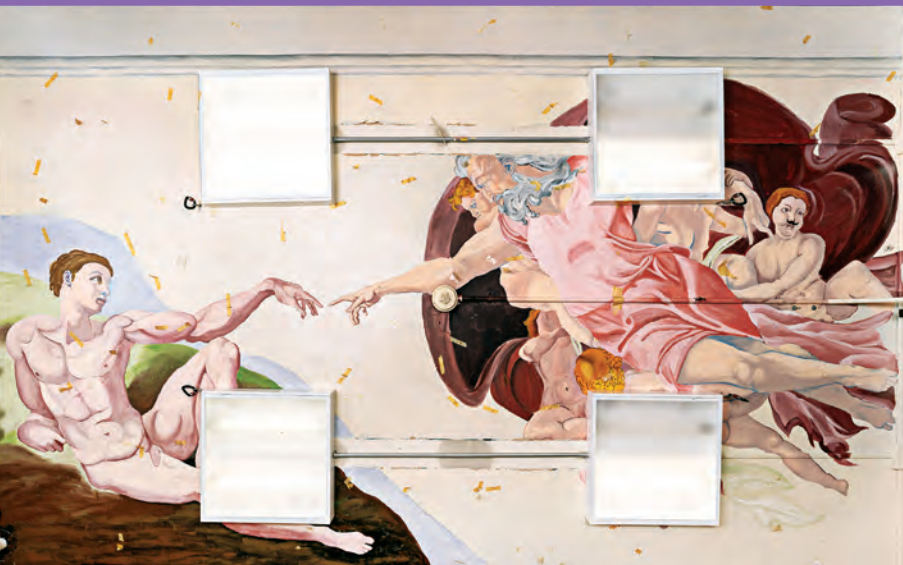


A favorite mural from Fifth West is an homage to the art of Josan Gonzalez, who illustrated William Gibson’s 1984 science fiction novel *Neuromancer*, one of the earliest and most famous works of literature in the cyberpunk genre, which features futuristic technological and scientific achievements in dystopian settings.

“The *Drowning Man* from Fourth East is one of the most detailed murals,” says East Campus president Jordan Tierney '25, noting that the artist, Bob Sabiston '89, SM '91, went on to develop a new technique for film animation called interpolated rotoscoping while working in the MIT Media Lab. “It makes sense that he became an animator, given the quality of the mural,” adds Tierney.







In the spirit of Michelangelo's *Creazione di Adamo*, a fresco painting on the ceiling of the Sistina Chapel, this East Campus favorite did not appear on a wall. Students painted their rendition of *The Creation of Adam* on the ceiling of Second East.

# Legacy of Student Art in East Campus

Every residence hall at MIT has a unique culture, and the nearly 100-year-old East Campus is widely regarded as a bastion for self-expression, exemplified by the ever-changing murals painted by students on the walls of common areas and private rooms.

The residence's two distinctive parallel buildings are now undergoing a major renovation, with plans to reopen to students in fall 2025.

Before East Campus closed this past summer, a renovation committee and advisory group including MIT students, faculty, alumni, and administrators launched a project to digitally preserve some of the most beloved student art. Thanks in part to a generous gift, all student artwork was photographed, and students from each of the 10 halls selected a piece of particular significance to be captured in high resolution, printed, and reinstalled in the renewed building.

The dragon of Fifth East (pictured at left) is among the art chosen for future display. Legend has it that undergraduates initially painted the creature to be visible only under a black light. The dragon is believed to be the first mural ever painted in East Campus; eventually, nearly every wall was covered with wildly creative art.

While the refreshed East Campus will look more modern and provide more comfortable and sustainable living, the project team has taken care to include space for artistic expression: large, movable wall panels in the residential corridors will offer a fresh canvas for the East Campus artists of the future. —Christine Thielman



PHOTOS: BRYCE VICKMARK

## GIVE TO EAST CAMPUS

Just as the generosity of MIT Class of 1893 alumni made it possible to break ground on East Campus in 1923, support from today's alumni and friends will shape East Campus — right down to the art on the movable panels — for future generations.

LEARN MORE AT  
[betterworld.mit.edu/eastcampus](https://betterworld.mit.edu/eastcampus)

give



# Think Globally and Hyperlocally

Class assesses climate policies in cities throughout the world

TITLE

**11.169 Global Climate Policy and Sustainability**

INSTRUCTOR

Janelle Knox-Hayes, professor of economic geography and planning, Department of Urban Studies and Planning



FROM THE CATALOG

Global Climate Policy and Sustainability, offered by the Department of Urban Studies and Planning (DUSP), examines climate politics both nationally and globally. Using case studies from various regions, students assess the impact of sociopolitical, economic, and environmental values on the development of climate strategies. Students gain a better understanding of how policymaking works in different parts of the world and make recommendations for more effective and sustainable climate action.

CLASS STRUCTURE

“Climate change is such a complicated phenomenon with scientific, economic, political, social, and cultural dimensions,” says Knox-Hayes. **“This class challenges the underlying notion that climate change is just a technical problem of reducing greenhouse gas emissions.”**

The course teaches future planners to consider all of these dimensions by thinking both globally—about the future of the climate—and hyperlocally—about what people need from their cities to continue their lives and livelihoods.

The class is open to undergraduates, graduate students, and other groups affiliated with MIT, including participants in the Special Program for Urban and Regional Studies, a one-year program for midcareer urban development professionals. Discussion-heavy classes allow for the sharing of experiences and perspectives, **helping students to contextualize complex topics.** Collaborating with classmates of different ages and backgrounds approximates real working conditions.

The semester is framed around the central team project of creating either a climate action prospectus or an in-depth case study for a city of the team’s choice. Modules help students think through the myriad factors that contribute to a given city’s response to climate change, and assignments guide students along the multiple steps required to conduct comprehensive study.

Lectures explore national and global interplay, focusing on the countries

Leyla Uysal, cross-registered from the Harvard Graduate School of Design: “I always thought we could solve these problems with science or technology, or from good planning or design. But that all must be implemented through the policies.”

Rose Winer-Chan MCP '23: “A lot of this content is very interesting, but it’s really only given nuance and depth when you hear about how people have applied it.”

Anushree Chaudhuri '24, SM '25: "The Maldives is such a small country that a lot of climate action is centered at the national level. We met with representatives from the [Malé City government] to understand the issues at the local level."

Winer-Chan: "They're quite advanced in their climate action...so we did a deep dive into elements of the climate action plan that we thought could be fleshed out more fully."

Uysal: "Eskişehir had very well-structured, well-detailed, well-documented examples. Şanlıurfa had nothing, literally nothing, except one picture. We ended up comparing these two cities and describing the corruption at the local level, regional level, and national level."

covered in Knox-Hayes's book *The Cultures of Markets: The Political Economy of Climate Governance*. Each semester, Knox-Hayes updates the information from the book with current climate issues.

For example, in 2019, the class explored how the historic Australian drought and wildfire season impacted climate policy across the board, including the commissioning and ultimately shortsighted decommissioning of an expensive desalination plant that was mitigating Australia's drought-induced water crisis.

"It's this fascinating dynamic where politicians are trying so deeply to please the polity and respond to whatever the concerns are on the ground, but no one can ever quite get the messaging or the response, at least in the political form, to climate change right," says Knox-Hayes.

### Seeing globally to plan locally

Understanding the vast, complicated inputs that affect climate policy is key to the urban planning profession.

"I want class participants to have an understanding of the interdisciplinary and diverse nature of climate change, what it means, and then an understanding of how to build responsive strategies," says Knox-Hayes. The eight teams in the spring 2023 cohort studied cities that spanned the globe—including **Malé City, the Maldives; Belo Horizonte, Brazil; and Eskişehir and Şanlıurfa, Turkey.**

Students present their findings during the last two weeks of class, bringing to light the many similarities within city cases across the globe, including the **importance of assessing where funding comes from and where it goes.**

Global Climate Policy and Sustainability will be an elective in the new Climate System Science and Engineering degree program, jointly offered by the Department of Civil and Environmental Engineering and the Department of Earth, Atmospheric and Planetary Sciences (see story below).

"The lecture material speaks to a number of disciplines, and that's why it sits very well in an interdisciplinary major on climate change," says Knox-Hayes. "For DUSP students, it's training them as future planners to be able to respond to this in whatever real-world scenarios they're working in." —Stephanie M. McPheerson SM '11

Chaudhuri: "Where funding comes from really influences the projects or initiatives. In my own work, I want to ensure that funding always allows for community control and ownership over both data and outcomes."

## Educating Climate Leaders

In April 2023, MIT announced the launch of Course 1-12 Climate System Science and Engineering, a bachelor degree program offered jointly by the departments of civil and environmental engineering (CEE) and Earth, atmospheric, and planetary sciences (EAPS). The new major is designed to further the Institute's goal of approaching climate action through innovative interdisciplinary solutions.

"Climate change is an incredibly important issue that we must address, and time is of the essence," says Ali Jadbabaie, the JR East Professor and CEE department head. "There has never been a more crucial time for us to advance students' understanding of both climate science and engineering, as well as their understanding of the societal implications of climate risk."

Students who choose the new major can take classes such as Engineering Sustainability: Analysis and Design Mechanisms; Models of

the Global Carbon Cycle; and Weather and Climate Lab, as well as classes that apply a social science lens to climate change such as Global Climate Policy and Sustainability (see story at left). "What's exciting is that many of the best jobs in this field call for leaders who can combine the analytical skill of a scientist with the problem-solving mindset of an engineer," says Robert Van der Hilst, the Schlumberger Professor of Earth Sciences and EAPS department head. "That's exactly what this new degree program at MIT aims to prepare students for. But it's not just about career opportunities. It's also about making a real difference and safeguarding our future."

*A longer version of this story was published on MIT News (news.mit.edu) in April 2023.*





# mentorship at mit

Mentorship can be found all over at MIT, whether it's senior faculty offering guidance and support to early-career academics, advisors helping students navigate challenging coursework, or peers exchanging practical advice about school and life. For MIT's faculty, researchers, and students, great mentorship is mutually beneficial. It transcends the day-to-day of teaching, learning, and living to become, in the words of one professor, a supportive route to a "sense of purpose and joy."

# Your Friendly Neighborhood Mentors

MIT Resident Peer Mentor program formalizes the peer support that has always been a hallmark of residential culture

---







Far left: Burton-Conner House peer mentor Kyna McGill '25 (center) with Kaylie Cornelius '26. Left: Mitali Chowdhury '24, a mentor in East Campus, and Ygor Moura '24.

PHOTOS: SARAH BASTILLE PHOTOGRAPHY

all undergraduate residences in the following years. Survey data have shown a marked increase in awareness of and appreciation for RPMs among first-year students, and mentors have refined their outreach efforts and event-planning strategies to help first-year students find their way at the Institute. “We’ve been intentional, from the time our first-year students step on campus, about their awareness of these amazing upper-level students who are serving as a formal and informal resource,” says Tasha Coppett, associate dean for residential life. “All students are required to live in a residence hall in their first year, so every single one of them has a touch point through a peer mentor.”

The program’s success has inspired Coppett to think about expansion. “We’ve learned in the past that these programs are more successful when our students are leading them,” she says. “The RPM program builds on creating a strong sense of community and encouraging our students’ success academically, personally, and socially.”

Students bring their own personality, skills, and style to the RPM role, but they share a common takeaway: mentoring fellow students has enriched their MIT experience and helped them build essential life skills that go beyond academics.

#### A family dynamic

“In my first year at MIT, I kind of got swept up in the experience,” says McGill. “I joined a crazy amount of clubs, and in terms of picking my classes, I was running with no plan.” Finding upper-level student mentors through her extracurriculars, classes, and student and alumni groups helped her navigate the “firehose” of MIT, and she eventually chose a double major in business and women’s and gender studies. “In becoming an RPM, I also wanted to help first-years get a better head start,” she says.

Residential life presents a huge opportunity. “There are so many different cultures of Burton-Conner, and I love that it’s a cook-for-yourself dorm,” she says. “I love the social elements of being a mentor. It’s mostly about being

“MIT is... MIT’s hard, right?”

Speaking bluntly, Mitali Chowdhury '24, a resident peer mentor (RPM) in the East Campus residence hall, sums up the demands of student life. “People put a lot of pressure on themselves, both for academics and outside activities,” they say. “Feeling secure within a community takes a lot of the social stress off.”

The MIT Resident Peer Mentor program complements the mentorship that happens naturally in undergraduate residences across campus as part of MIT’s larger network of peer-led support initiatives designed to support the whole student. “MIT is a beautiful but challenging place, especially for first-year students,” says Anas Chentouf '24, an RPM in Maseeh Hall. “Fortunately, MIT has a lot of resources, but also—unfortunately—MIT has a lot of resources. Resident peer mentors can help first-years find their way to the right resources. RPMs are your friendly neighborhood mentors.”

More than 100 RPMs—approximately one for every 10 first-year students—serve as guides to resources across the Institute, encourage community, and give advice on challenges that range from choosing the right major to managing disputes with roommates. “If first-years have a question, I can point them in the right direction, even if I don’t have the answer,” says Kyna McGill '25, an RPM at Burton-Conner House. “I’m an extra resource who they can talk to anytime.”

The RPM program was established in 2016, and a gift from Alan Wilson '82 allowed the program to expand to

“If first-years have a question, I can point them in the right direction, even if I don’t have the answer,” says Kyna McGill.





Anas Chentouf '24, a resident peer mentor in Maseeh Hall.

PHOTO: SARAH BASTILLE PHOTOGRAPHY

around and being a friendly face—someone to wave to in the hallways and answer texts late at night. It's like having a friendship with a specific purpose that's like, hey, by the way, you can ask me anything anytime."

McGill's support of students even extends to her wardrobe. "I have a lot of dresses, and I lend them out to everyone on my floor all the time," she laughs. "Instead of going out shopping, they'll come borrow my clothes." That "older sibling" dynamic extends to general life skills. "It's not all about academics or extracurriculars," she says. "Upper-level students and RPMs will do things like go grocery shopping with you. It can be hard to know how to be a real adult for the first time when you get to campus. Sometimes it's how to pick a major, but sometimes it's about how to get a stain out of your clothes."

#### Learning to listen and guide

Chowdhury appreciated the support of their RPMs in their first year at MIT. "The support really helped me grow into being in college and becoming my own person outside of living at home," they say. Junior year, they jumped at the chance to become an RPM.

As a resident mentor, Chowdhury knows they've entered into a timeless MIT tradition, but in a slightly different way than in decades past. "This type of mentorship structure has always existed at MIT, and this program is formalizing it," they say. "But I've found that the RPM program doesn't overstep—it's not so formalized as to be unnatural. It adds some structure to help us reach more students while keeping it as an organic thing."

Chowdhury has plenty of opportunities to flex their leadership skills as president of the MIT Dormitory Council, MIT's student government body representing all undergraduate dormitory residents, for the 2023–2024 academic year. "I've realized that the skill of learning *how* to mentor is extremely valuable," they add, citing active listening training as a particularly memorable part of the program. "It's more about learning how to guide people with your outside perspective and to help them figure out what their options are and see different courses of action more clearly."

#### Paying it forward

Anas Chentouf can't resist using scientific examples to describe the Resident Peer Mentor program. "An RPM is a catalyst—they offer an alternative pathway to seeking help with a lower activation energy than formal faculty and staff advisors to address certain issues around academics, health, and community," he says. "We're someone who you could run into playing foosball in the lounge—someone extremely accessible, which increases the chances of a metaphorical collision."

A "collision" with an RPM means the opportunity to help a fellow student, and Chentouf doesn't take that lightly. "MIT has an amazing culture of giving advice," he says. "I think it's only fair that we maintain the same ecosystem for our fellow students." When Chentouf started classes while campus was fully remote during the early stages of the pandemic, he remembers the impact of other students reaching out to introduce themselves. In that spirit, he applied to be a mentor himself. "I think helping in any way possible, even if it's a small thing, is a noble task."

When Chentouf thinks about his mentors and friends, the image of a family tree comes to mind, with "descendants" who have the potential to spread more knowledge even further. "The idea of a mentorship family tree is beautiful, and embodies my gratitude to my mentors," he says. "It was beautiful on their part to go out of their way to reach out and go above and beyond."

—Joelle Carson



#### IN SUPPORT OF FIRST-YEAR STUDENTS

Gabrielle Stoy, mathematics instructor in the Experimental Study Group, and undergraduates Angeles Cibils Bernardes '25 and Katie Miner '24 — recipients of outstanding advisor awards — talk about mentoring the first-year community.

READ MORE AT

[betterworld.mit.edu/spectrum/first](https://betterworld.mit.edu/spectrum/first)



# Champions of Student Wellness

Joana Nikolova '23 reflects on her role as a Wellbeing Ambassador



Joana Nikolova's favorite place on campus is La Casa (the Spanish House), a cultural community in New House where she spent time with her housemates cooking, studying, and relaxing. "It was like having my own little family away from home here on campus," she says.

La Casa is not the only way Nikolova found solace at MIT. She also participated in the Wellbeing Ambassadors program — part of a large network of peer leadership programs at MIT that includes MedLinks, Resident Peer Mentors, and Peers Leading Education About Sexuality and Speaking Up for Relationship Empowerment. The Wellbeing Ambassadors, which has benefited from generous donor support, brings together student leaders who are passionate about promoting a culture at MIT where they and their peers can prioritize well-being. "In order to be successful in other areas of your life, wellness has to be prioritized," says Nikolova, who joined the program as a sophomore. "Throughout the

years, I started to realize just how important this whole experience is for me personally. This program helps me to take care of myself."

That hasn't always been the case, says Nikolova, for her and for many of her classmates. "Many people forget to take care of themselves in the midst of their academic life," she observes. She and her fellow ambassadors encourage their peers to prioritize mental and physical health, social connections with others, and taking time to clarify their sense of purpose. "We're available to have honest conversations, which include helping people confront unhealthy sleep, diet, and social habits." For Wellbeing Ambassadors, perfection is not the goal, Nikolova says. Failing, then getting up and trying again, is celebrated.

After graduating last May with a bachelor's degree in aerospace engineering, concentrating in

space exploration, Nikolova is pursuing a master's degree at MIT and will continue to participate in the ambassadors program. "I really enjoyed being a part of the Wellbeing Ambassadors, and hopefully my research will allow this to continue," she says.

MIT is developing new wellness-oriented student spaces such as the renovated Stratton Student Center's Wellbeing Lab, which offers programs and workshops on financial, physical, and mental well-being along with networking and social events. "I am so excited about the new lab," says Nikolova. "The Wellbeing Ambassadors will be able to meet there regularly with members and anyone who wants to get involved. It's going to have such a wonderful impact on the whole community." —Kendra Williams



SUPPORT THE WELLBEING AMBASSADORS AT [giving.mit.edu/ambassadors](https://giving.mit.edu/ambassadors)

Kendra Williams is a 2023 Council of Advancement and Support of Education (CASE) Summer Intern.

## Mentorship in Action

AT MIT, mentorship is a powerful connecting thread that weaves together individuals from every corner of the Institute. **JULIE A. LUCAS, VICE PRESIDENT FOR RESOURCE DEVELOPMENT**, talks about MIT's robust mentoring landscape and how alumni and friends can play a part.

### What is distinctive about mentorship at MIT?

The first thing that comes to mind is that mentorship is everywhere! Every day across campus, faculty and instructors guide students through tough research challenges. Researchers help early-career counterparts navigate academia. Senior undergraduates give new students welcome advice. Alumni offer budding entrepreneurs industry wisdom. Graduate students assist potential applicants in presenting their best selves. The list is almost endless.

Throughout this issue of *Spectrum*, stories from across MIT paint a vivid picture of formal and informal mentorship in action. What's striking about these examples, and indeed the full scope of mentorship activities at MIT, is that they consistently demonstrate a core value championed by the entire community—that we learn from each other.

**MIT strives to create a campus community where academic excellence and personal well-being are valued and promoted. How does mentorship fit in?**

Among MIT's highest priorities is to educate the whole student across every aspect of their MIT experience. One of the many ways we are accomplishing this goal is through the Resident Peer Mentor program (see story on page 8), where more than 100 upper-level mentors across MIT's undergraduate residences provide guidance and community building for first-year students—and gain valuable leadership experience in the process. The initiative is a terrific example of how mentorship enriches the lives of both the mentor and the mentee.

Meanwhile, the Wellbeing Ambassadors program (see above), attracts student leaders who are passionate about promoting a culture at MIT where they and their peers can prioritize mental and physical health. We're delighted that the ambassadors, and every student on campus, can now take advantage of the new Wellbeing Lab in the renovated Stratton Student Center.

### How can MIT alumni and friends support mentorship across the Institute?

Just as there are numerous avenues for MIT students and faculty to experience the benefits of mentorship, there are also myriad opportunities for alumni and friends to support the people, programs, and spaces that promote and foster mentorship, many of which are captured in these pages. Gifts of all sizes are fundamental to helping MIT fulfill its mission to serve the nation and the world through education, research, and innovation. This includes our commitment to student life and learning. You can learn more about how MIT is supporting the whole student—and how our community can help—at [betterworld.mit.edu/whole-student](https://betterworld.mit.edu/whole-student).



# Paying It Forward

Inspired by transformative mentors, Jay Mahat is dedicated to helping students achieve their goals

As the first person in his family to attend college, Digbijay (Jay) Mahat had the enthusiastic support of his father, who wanted his firstborn to receive the education he had not. Mahat vowed to seek the highest degree possible in what he considered the most prestigious discipline—science—to stay true to his father’s dreams as well as his own.

Today, Mahat is a new father and an accomplished cancer researcher who considers humanity and public service to be every bit as important as education and science. “Science without the overarching purpose to improve society for future generations is inconsequential,” he says. Guided by advisors such as MIT Institute Professor and Nobel laureate Phillip Sharp and molecular biologist John Lis at Cornell University, where he earned his PhD in molecular biology and genetics, Mahat became a mentor with the belief that education can shape not only students’ professional trajectories but also the people they become.

“The soft skills of working in a group, the culture of sharing resources, and compassion towards each other mold us into better citizens,” says Mahat, a 2021 recipient of the Peter Karches Mentorship Prize at the Koch Institute for Integrative Cancer Research at MIT. The annual prize recognizes outstanding mentors of high school and undergraduate students working in the Koch Institute’s laboratories.

A postdoc in the Sharp lab since 2017, Mahat has hired and mentored five research support associates and six undergraduates at MIT, helping them plan, execute, and troubleshoot bench and computational work. He also participates in MIT’s PDA Buddy Program, which pairs new postdocs with more experienced colleagues who can offer advice and support.

“My mentoring goal is to help students succeed when they move on to the next phase of their life,” Mahat says. “I never take them as just an extra pair of hands on a project. As a mentor, I aspire to help them characterize areas that need improvement and partner with them to bridge that gap.”

Mahat wants his mentees to become independent, think creatively, and carve out a niche where they excel. He emphasizes the value of failure. “Science is a brutal

discipline. Most of the things we try fail,” he observes. “Sometimes it forces you to think in a different way than you otherwise would have. It could lead to a groundbreaking discovery.” In his own research, Mahat focuses on pancreatic cancer, seeking to understand “how the vast majority of our genome that does not make proteins, but provides instructions for making proteins, contributes towards health and diseases.”

Nathan Han ’21, MNG ’23 was supervised by Mahat during an undergraduate research project in the Sharp lab and now works as a computational biologist. “Jay gives very knowledgeable guidance but also allows his mentees to be creative,” he says. “Only the best mentors are able to perfectly strike such a balance between guidance and intellectual latitude.”

Shayla Nguyen ’24, a computer science major, had never worked in a biology lab before her experience with Mahat. She says he guided her every step of the way. “The best piece of advice he gave me was to ask more questions,” Nguyen says. “He created a safe space for me to learn while contributing to a meaningful project.”

An advocate for diversity and equity in academia, Mahat mentors many scientists and researchers from underrepresented groups. He also hears from students in his home country, where he is recognized for connecting Nepali government officials to Covid-19 vaccine and test manufacturers during the pandemic.

“I come from a region of Nepal where the most physically gifted join the British Army, the next best group joins the Indian Army, and most of the rest head to the Middle East or Malaysia for migrant labor,” says Mahat. “The freedom to choose a scientific direction, and in close proximity to the best scientists of the world, is immensely gratifying. Not only am I able to advance my career as a scientist, but I am fortunate enough to help others from underprivileged backgrounds who dream of being a scientist, like I did many years ago.” —Pamela Ferdinand





# UROP Professor Relishes Role

**Basima Tewfik, who studies impostor syndrome, honored by students for her guidance and commitment to undergraduate research**

Basima Tewfik knows impostor syndrome inside and out. As the Class of 1943 Career Development Professor and assistant professor of work and organization studies at the MIT Sloan School Management, Tewfik spends her days researching the phenomenon, which she defines as the belief that others think you know more than you think you do at work. “It’s a bit ironic to study this phenomenon—what I call workplace impostor thoughts. I often joke that it’s precisely when sharing my research or when people are asking for my insights on it when I, myself, have impostor thoughts. I think, ‘There is so much I don’t know and have yet to uncover,’ she says. ‘They may be overestimating my competence.’”

Tewfik opened her research lab to students through the MIT Undergraduate Research Opportunities Program (UROP) in June 2020. This past spring, she was honored with the Outstanding UROP Mentor Award for the 2022–2023 academic year. Mentors are student-nominated based on the quality of their support and guidance, their availability, and their overall commitment to undergraduate research.

“I was really touched,” Tewfik says. “Honestly, my first thought was, ‘How lucky I am to be working with not only extraordinarily smart and fun undergrads but also such thoughtful ones.’”

Tewfik began studying sociality in the work environment as a junior at Harvard University. She worked with a psychology professor and graduate student studying participants while they played Mafia—a card game where one player is secretly a lethal crime boss and the rest of the players must suss out the guilty party. The experiment looked at whether players’ social perception, as noted through success in the game, correlated to leadership skills. Later, Tewfik dug into impostor syndrome during her doctoral studies in management at the Wharton School of the University of Pennsylvania. Her dissertation was titled “Impostor Thoughts as a Double-Edged Sword: Theoretical Conceptualization, Construct Measurement, and Relationships with Work-Related Outcomes.”

“Somewhat counterintuitively, I had the hypothesis that having workplace impostor thoughts could be an interpersonal superpower,” she says. “After all, a lot of



the people who seemed to claim to have experienced this phenomenon are often those who others seem to think are quite charming. Think Tina Fey, Oprah Winfrey, or Tom Hanks.”

Tewfik says she experienced impostor thoughts during her first job out of college in a management consulting firm, where she was required to present herself as an expert in a broad range of topics. “Interestingly, for those of us who had impostor thoughts, a lot of us got told things like ‘You’re great’ or ‘You’re fun to work with,’” she says. “This observation is consistent with my research findings. Those who have workplace impostor thoughts subconsciously adopt an orientation focused on others to compensate for our perceived deficiencies in competence.”

In other words, there seem to be social benefits to impostor syndrome, such as increased likability and interpersonal skills. Tewfik is also researching the functional benefits of certain neuroses for job performance, especially in the context of inconsistent engagement.

Tewfik’s research is particularly relevant as expectations on both sides of the manager-employee relationship have shifted significantly since the start of the Covid-19 pandemic. In her lab, UROP students get a chance to explore that changing dynamic before going into the workplace.

Mentees start with tasks such as literature reviews, participant recruitment, proofreading, and generating research designs. As they gain more experience, Tewfik and her students tailor the work toward student interests. “UROPs provide students with the opportunity to cultivate deeper relationships with faculty and to delve into areas they might not otherwise be able to explore within the classroom,” says Tewfik. “Our students are so bright and so fun. It seemed like a no-brainer to team up with such a fabulous group on work that I deeply enjoy.”

Tewfik, who also teaches classes in negotiation, finds that mentoring takes teaching one step further. “With teaching, I tend to be focused on making sure students master a specific set of skills,” she says. “With a mentoring mindset, I am not only focused on teaching students new research skills but also on getting an understanding of my mentees’ broader interests so that we can work together to promote more comprehensive learning and growth.”

—Stephanie M. McPheison SM '11

 SUPPORT THE UNDERGRADUATE RESEARCH OPPORTUNITIES PROGRAM AT [giving.mit.edu/urop](https://giving.mit.edu/urop)

# MENTOR

# MENTEE

# MENTOR

# MENTEE

**The advantages of good mentorship flow in both directions. While students and junior faculty benefit from the wisdom of someone else's experience, their mentors are energized by the unique perspective and fresh energy mentees can bring to a research challenge. *Spectrum* spends time with five faculty mentors and their mentees across campus to see how they work — and learn — together.**

## Positive Energy

**Collaboration with Professor Yang Shao-Horn, who works to uncover materials for next-generation batteries, cultivated Associate Professor Betar Gallant's intellectual potential**

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In fall 2005, MIT sophomore Betar Gallant '08, SM '10, PhD '13 was finishing a lab for an introductory class on engineering materials when the instructor, Yang Shao-Horn, struck up a conversation with her about battery materials.

Listening to Shao-Horn, now the JR East Professor of Engineering in the departments of mechanical engineering and materials science and engineering, talk about how specific arrangement of atoms dictates a material's behavior, Gallant started to appreciate how molecular elements might be arranged to create new material properties. "It was really interesting, and I knew I wanted to learn more," she recalls.

Gallant had developed a love of physics and an interest in electric vehicles growing up in Natick, Massachusetts, where she performed makeshift experiments in the basement with her dad, a polymath with diverse interests in English, music, engineering, and physics. Her father died after a long illness when Gallant was 16. While grieving, and when she was "missing him the most," Gallant pored over the textbooks that had captivated him. She wanted to explore, as he had, a career in engineering.



But as a first-year student at MIT, Gallant felt intimidated. Everyone else seemed to know their path forward. “I didn’t have a crystallized view of the one thing I wanted to do,” she recalls.

Enter Yang Shao-Horn, whose research explores what occurs at a molecular level as charges transfer with the help of catalysts within electrochemical power sources such as batteries and fuel cells. Her work has led to promising materials for energy storage and conversion, helping engineers design lighter, more energy-dense, efficient, and sustainable versions of the lithium-ion batteries used in electric vehicles.

In 2005, Gallant joined Shao-Horn’s research group through the MIT Undergraduate Research Opportunities Program. She credits Shao-Horn’s personal attention and approachability with giving her the confidence to ask to be a part of the lab.

“That single conversation made me think, ‘This is an opportunity to engage and see if I can get involved in research or learn more,’” Gallant says.

For the rest of Gallant’s undergraduate years and then as an MIT graduate student, she worked in Shao-Horn’s lab alongside materials scientists, mechanical engineers, and chemical engineers with a common goal: designing new materials for energy storage and delivery devices.

Shao-Horn, according to Gallant, “has a remarkable ability to say, ‘Let’s hunker down, figure out what we understand, where we need to keep working, and where we’d like to go. We’ll find our way through it.’ And we always did. That attitude really shaped how I think about perseverance and what’s possible.”

After earning three degrees at MIT and completing a postdoctoral fellowship at the California Institute of Technology, Gallant joined the Institute’s faculty in 2016. Now the Class of 1922 Career Development Professor and associate professor of mechanical engineering, she continues groundbreaking research on advanced battery chemistries. Her group focuses on the electrochemical reactions needed to improve battery technologies, such as those based on lithium metal anodes and advanced cathode chemistries for a range of applications.

“We’re also looking at chemistries beyond the classical lithium-ion footprint, like calcium-based batteries and other lithium alternatives,” Gallant explains. “These are not likely to replace lithium-ion batteries, but they could provide functionality in important applications where we don’t need the performance of lithium.”

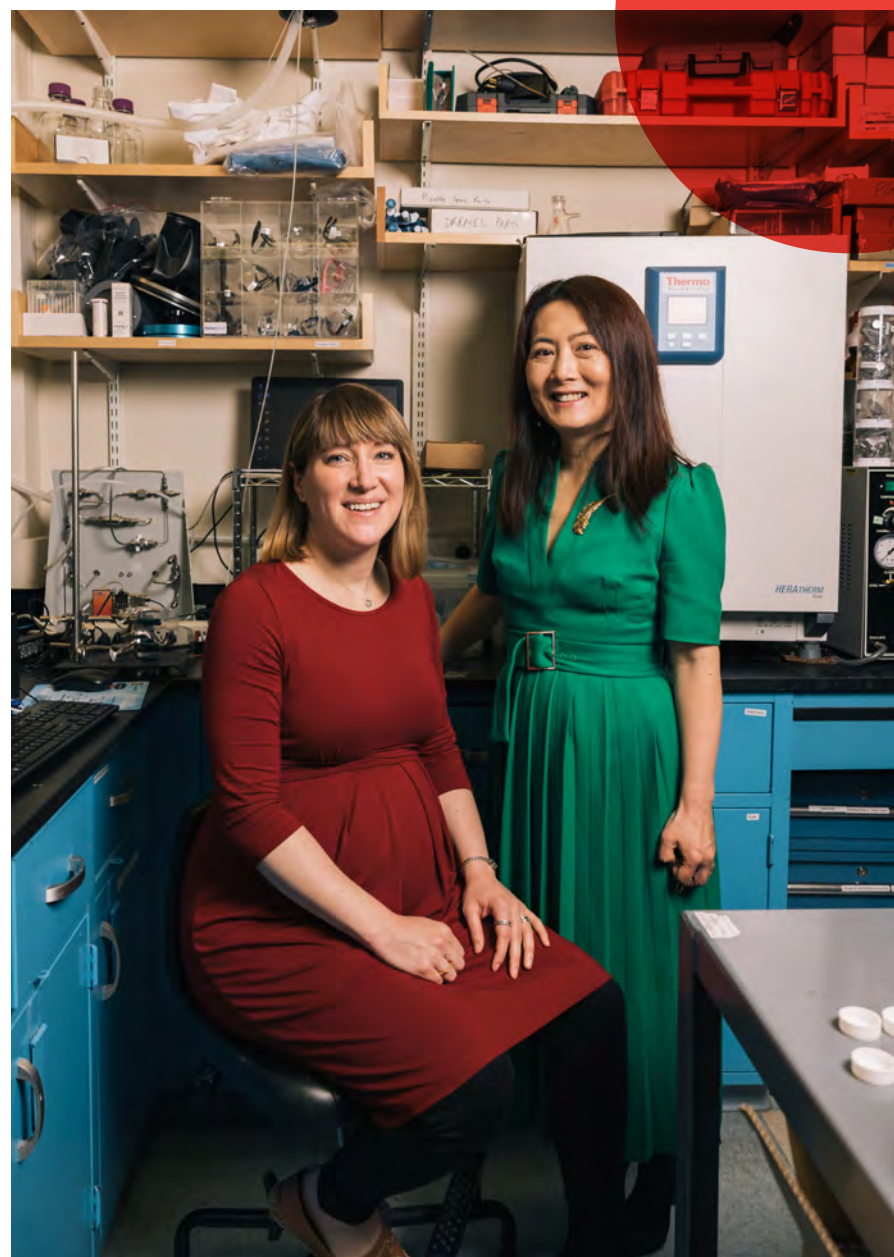
Shao-Horn is still her mentor, according to Gallant. “I didn’t know anybody in academia growing up. Yang taught me, beyond the specifics of research, what it is to be a professor and an academic,” Gallant says. “She lights up when having an intellectually probing discussion with her students, reviewing and thinking through the data with them. That’s something I’ve taken forward with me in my own faculty career.”

Both women appreciate the paths forged at MIT by women who preceded them. “We still have a long way to go, but we are making steady progress,” says Shao-Horn. Mary Boyce SM ’84, PhD ’87, the Institute’s first tenured female mechanical engineering professor, mentored Shao-Horn and served on Gallant’s PhD thesis committee.

“The best mentorship is not about the technicalities of how to progress along some known path but about seeing and cultivating the unique strengths and intellectual potential of another person,” says Gallant. “Yang’s mentorship helped me learn to express my own ideas and find my own way by encouraging not what, but how to think.”

—Deborah Halber

“She lights up when having an intellectually probing discussion with her students... That’s something I’ve taken forward with me in my own faculty career,” says Betar Gallant.



Associate Professor Betar Gallant '08, SM '10, PhD '13 and Professor Yang Shao-Horn.

PHOTO: JAKE BELCHER

# Supporting Intellectual Drive

With golf as a backdrop, MIT Sloan's David Thesmar guides PhD student Tim de Silva in research on the impact of "noise"

When Covid-19 made traditional academic settings impossible for much of 2020, David Thesmar, the Franco Modigliani Professor of Financial Economics at the MIT Sloan School of Management, found a novel way to connect with his mentee, PhD student Tim de Silva SM '21—over a game of golf.

De Silva had completed the coursework for a PhD in management with a concentration in economics, finance, and accounting and was ready to conduct research. "Having a good advisor plays a really important role in making that transition," he says. He had taken courses with Thesmar, whose research interests include corporate finance and behavioral economics.

Impressed with his work ethic and intellectual curiosity, Thesmar invited de Silva to work on a project. "Senior faculty usually has the idea," de Silva says, "and the student helps with grunt work and execution, since they don't have the skills yet." In the course of early-stage research discussions, the two discovered they were both avid golfers.

Since by then outdoor activities were known to be safe, "we started playing golf instead of having Zoom meetings," says de Silva. "Without seeing him in person, I think I might have been lost. Nine holes take two hours, which gives you lots of time between shots to have longer discussions."

Their research examined the impact of "noise" on financial forecasting. Economists define noise as variability in human decision-making that should yield identical results. For example, according to Thesmar, studies show that a doctor presented with the same patient and symptoms on separate occasions will not necessarily make the same diagnosis each time. Noise is observed in decision-making in fields that include judicial sentencing, hiring, and investing.

Thesmar, with de Silva's help, analyzed a large data set of profits and forecasts from companies dating back to the early 1990s and was pleased with the energy his student brought to their investigation. "I've written quite a few papers with my students, and it's a two-way learning process: we teach them what is a good question to analyze, while they bring new ideas and new techniques." Their work resulted in the publication of a paper, "Noise in Expectations: Evidence from Analyst Forecasts."

They found that forecasts were very noisy, and that the further out people try to forecast, the more influenced by noise they become. Their work may lead analysts to improved accuracy in the future—one practical recommendation they make to reduce noise is to ask several analysts for their opinions, even if they are non-expert, instead of just one. "Taking the average forecast reduces noise," says Thesmar. "People have called this the 'wisdom of crowds.'"

## "He's extremely intuitive, and I'm more detail oriented"

De Silva is grateful to have learned from Thesmar at a critical time in his academic development, noting that the shift from taking classes to working full time on research is stressful for graduate students, and that the pandemic exacerbated that uncertainty. "You wake up every morning and think, 'I don't have classes or exams and in three years I have to have a dissertation.'" But if there was a golf game with Thesmar on the calendar, "I knew I had to have something to say about the project I was working on with him as well as my own potential dissertation topics."

The pair worked well together, and while de Silva says they are similar in their research styles, "we also have differences that are very helpful. He's extremely intuitive, and I'm more detail oriented. Because he has the big-picture view and I'm the one who does more of the execution, that works perfectly."

Thesmar remarks that as a former athlete (de Silva played golf and trained as a racing driver in high school and college), his mentee is very disciplined. "Athletes learn to delay gratification. They do a lot of work without seeing an immediate payoff," he says. "That has always impressed me because I am not like that!" He also points out that their roles were reversed on the golf course: "I am the student and he is the master. Tim's an amazing player, and I am enthusiastic but very clumsy."

De Silva acknowledges MIT Sloan's notably high level of interaction between students and professors. "MIT Sloan professors and students tend to be outgoing and social, and the work is naturally collaborative." He will enter the academic job market in the spring of 2024 and hopes to join the faculty of a research-focused business school.

His mentor is confident that he will succeed and is grateful to have played a role in his growth. "Mentoring is part of our job, I've always thought," says Thesmar. "It's not just the research we produce; it's the students we bring to the world." —Christine Thielman

Professor David Thesmar and PhD student Tim de Silva SM '21.

PHOTO: KEN RICHARDSON





# The Right Guiding Star

**Professor Marzyeh Ghassemi is glad to have crossed academic paths with Professor Peter Szolovits. The feeling is mutual.**

During a 2019 interview on Stanford University's *Women in Data Science* podcast, Marzyeh Ghassemi PhD '17, the Hermann Von Helmholtz Career Development Professor, declared that having a supportive mentor contributed greatly to her success as a graduate student. "It's not the project that makes you successful," she said. "Having the right mentor, and the right people around you, should always be your guiding star."

In Ghassemi's case, the right mentor was Peter Szolovits, a professor of computer science and engineering, who served as her PhD and postdoctoral research advisor. Ghassemi first spoke with Szolovits in early 2010 when she was thinking about where to apply for graduate school, then contacted him again in December 2010 after she'd been accepted to MIT and had to decide which lab to join. Szolovits is an expert on applying artificial intelligence (AI) methods to the practice of medicine, which closely aligns with Ghassemi's interests. During that conversation 13 years ago, Ghassemi's infant daughter cried repeatedly, and Ghassemi apologized for the interruptions, worried that she was making a bad impression. "That's OK," Szolovits assured her. "She's just asking for her fair share of your time."

That remark pretty much sealed the deal, Ghassemi recalls. "I realized right then that this was the person for me, someone who would understand that as a nontraditional student—a mother and practicing Muslim who was homeschooled and attended New Mexico State University—I may not be on the same track as everyone else in the lab. He recognized that there are many paths to success."

Szolovits is grateful that she opted to work in his lab and join the Clinical Decision-Making Group, which he leads in the MIT Computer Science and Artificial Intelligence Laboratory. "She's a spectacularly good researcher and is immensely energetic," Szolovits says. "She's definitely one of the

Professor Peter Szolovits and Professor Marzyeh Ghassemi PhD '17.

PHOTO: JAKE BELCHER

best students I've had in my 49 years of teaching at MIT."

## Learning how to become a researcher

Ghassemi's first big task was to choose a research topic, and Szolovits gave her the time and space she needed for that decision. "Some mentors present students with a list of the top-10 open problems in their field, but that's definitely not my style," he says. "I consider learning what to do an important part of the process of learning to become a researcher. I never get in the way of a student who has a good idea by trying to push them in some other direction."

When Ghassemi joined Szolovits's lab, much of the work involved using natural language processing tools to extract information from clinical notes written by physicians. She wanted to broaden the scope of these inquiries, drawing on additional information—vital sign data, bedside monitor readings, pharmaceutical records, and various lab measurements—to see whether machine-learning algorithms could make more accurate predictions regarding patient outcomes. Acquiring such a multimodal perspective was also one of Szolovits's goals, and it ended up comprising the heart of Ghassemi's dissertation project. In a 2014 paper written with Szolovits and others, she demonstrated "that by using vitals, labs, and processed clinical notes, you did better than using any of them alone." This result gave her

confidence that she was on the right path.

Although Szolovits expects to teach his students in the early stages of their work, before long, he expects to learn from them. "And I learned a lot from Marzyeh," he says, noting that she was the first person to spark his interest in the issue of fairness and bias associated with the incorporation of AI into medicine. "That has become a very important concern," he points out, both in Ghassemi's research and in the health care field more broadly.

Previously on the faculty of the University of Toronto, Ghassemi joined MIT in 2020 in the Department of Electrical Engineering and Computer Science—which is housed jointly in the Schwarzman College of Computing and the School of Engineering—and the Institute for Medical Engineering and Science. In addition to her research on effective and equitable uses of machine learning in health care, she now spends much of her time advising students, drawing on the valuable lessons she learned from Szolovits on the art of being a good mentor. "It's important to encourage students to explore things they personally find interesting rather than just gravitating toward what is 'hot' at the moment," Ghassemi says. "And perhaps the most valuable advice I got from Pete was not to compare myself to other people. 'You are running a one-person race,' he told me. 'Your goal is simply to do the best you can on this path that no one else is on.'" —Steve Nadis



# Wisdom of Ages

**MIT philosophy professor Sally Haslanger values the perspective of her young mentees**

By all accounts, Sally Haslanger is a great mentor. “I work on topics that are of immediate social and political concern,” says Haslanger, the Ford International Professor of Philosophy and an affiliate in the Women’s and Gender Studies Program at MIT; she also teaches in D-Lab. “It’s important to me to remain current, not just in the literature of philosophy, but also in how life unfolds for people of other generations. It’s really valuable for me to get their perspective.”

An MIT professor since 1998, Haslanger works on issues of social justice, along with epistemology, metaphysics, and the philosophies of language and mind. Deeply committed to promoting diversity in philosophy and beyond, she is best known for her work in feminist and critical race theory. At MIT, she is much sought after as a mentor.

“Sally is THE feminist philosopher,” says Eliza Wells, a fourth-year PhD student in philosophy and a Haslanger advisee. “I remember being nervous when I met her. But from the very beginning she made it clear she was invested in students. In the first course I took with her, an ‘analytic philosophy boot camp,’ she helped make us feel that the questions we were asking really mattered. I knew I wanted to work with her because I knew she cared about my growth.”

Third-year PhD student Sonia Maria Pavel, another Haslanger advisee, chose to pursue her doctorate at MIT largely because of Haslanger. “I’d heard her speak in Boston when I was an undergraduate at Brandeis,” says Pavel. “I applied to MIT so I could work with her. It was a bit intimidating at first, because she is such a prominent philosopher. But she is the most caring and thoughtful person I’ve met

in the world of philosophy. She’s incredibly generous with her time. You leave every conversation with her with new wind in your sails. She makes you feel like you can do this.”

Born and raised in Romania, Pavel studies the political philosophy of education, a specialty not directly related to Haslanger’s field of study. “I remember one day, soon after I began working with her, I went to her office and found a huge stack of books on the political philosophy of education that she had bought to read,” says Pavel. “She is so busy, yet she took the time to delve into my subject so she could offer the best possible feedback.”

Wells, who studies ethics, and specifically how our social roles impact our moral reasoning and behavior, appreciates her mentor’s broad knowledge base and her intellectual humility. “She doesn’t merely tell you what she thinks,” says Wells. “She gives you the resources you need to draw your own conclusions. And she’s never afraid to say she isn’t familiar with a certain area, and then to send you down the hall to talk to one of her colleagues who is. She’s inspired me in my own teaching.”

With Haslanger’s encouragement, both Wells and Pavel have participated in the Philosophy in an Inclusive Key Summer Institutes (PIKSI). PIKSI-Boston, held in collaboration with the University of Massachusetts-Boston and Harvard, encourages and prepares students from underrepresented groups to pursue advanced studies in philosophy. Haslanger, together with three MIT graduate students, founded PIKSI-Boston in 2015.

Before coming to MIT, Haslanger taught and mentored students at the University of California at Irvine, Princeton University, the University of Pennsylvania, and the University of Michigan. “My goal as a mentor is to give students the tools they need to navigate their particular area of interest, but also the tools they need to navigate the profession, which is not as welcoming as it should be to women and underserved minorities. I have worked and still work hard to change that,” she says. “My students are truly amazing, deeply committed, and brilliant. I know they will continue to change the field and will make a difference in people’s lives.” —Ken Shulman

**“You leave every conversation with her with new wind in your sails. She makes you feel like you can do this,” says Sonia Maria Pavel.**

From left: PhD student Sonia Maria Pavel, PhD student Eliza Wells, and Professor Sally Haslanger.

PHOTOS: (RIGHT) COURTESY OF SONIA MARIA PAVEL; (FAR RIGHT) TONY LUONG







Professor Joey Davis and biology PhD student Laurel Kinman.

PHOTO: KEN RICHARDSON

# Multidimensional Collaboration

**Biology professor Joey Davis's support inspires PhD student and protein enthusiast Laurel Kinman to prioritize mentorship in her career**

During Laurel Kinman's second semester as an MIT biology graduate student, she chose a few labs to explore. The second of three rotations was with associate professor of biology Joey Davis PhD '10, whose lab examines how bacteria, yeast, and human cells rapidly and efficiently assemble, disassemble, and reorganize the complex internal machinery that allows them to do their jobs.

"A lot of researchers work on how intracellular machines function once they're assembled," Davis says. "Our niche is to use biochemical, biophysical, and structural approaches to understand how they're built." Davis is particularly intrigued by protein-synthesizing ribosomes and autophagosomes, which help cells break down and recycle old, damaged, or abnormal proteins.

Kinman, a self-described protein enthusiast, liked the focus of Davis's lab, and already knew she liked Davis. During a fall seminar, she'd mentioned that she found systems biology challenging. "He'd said, 'Oh yeah, that class really kicked my butt when I was a grad student here,'" she recalls. "That was a nice thing to hear."

When her month-long rotation in his lab was over, she told Davis her mind was made up. "He said, 'Laurel, you have to give your third rotation fair consideration.'" She recalls telling him, "I'm gonna be back." A month later, she was.

As a child, Kinman pored over medical school textbooks belonging to her mom, a pediatric endocrinologist. Even before enrolling at Wellesley College for her undergraduate studies, she knew she would major in biology and mathematics.

Davis had majored in computer science at the University of California at Berkeley. Kinman's background in mathematics helped her confidently brainstorm with him about ways to process the massive digital output of one of the cutting-edge imaging tools, cryo-electron microscopy (cryo-EM), used by Davis's lab.

## Cryo-EM data in 3-D

Every time a cell divides, it recreates its entire complement of intracellular machinery in minutes. Cryo-EM flash freezes protein complexes, capturing them mid-assembly. The challenge is tying the resulting images to specific stages of forming complex three-dimensional geometries.

Cryo-EM's raw data comprise noisy two-dimensional snapshots. "You have to use those 2-D projections to reconstruct hundreds of three-dimensional volumes," Kinman explains. "It ends up being a computational task to figure out how all those pictures relate to one another so that you can build up a 3-D model."

The result is akin to an extraordinarily detailed, never-before-seen animation of how cells construct ribosomes and autophagosomes. The work could be critical to developing new antibiotics and treating diseases such as Alzheimer's and Parkinson's, among other uses.

## Inspiring fearlessness

Davis spent time in industry before opting for a career in academia, returning to MIT in fall 2017 as a faculty member actively seeking opportunities to mentor. "I can start with undergraduates the first time they've ever pipetted, or if they're graduate students, the first time they've thought about independent research and formulating hypotheses, experimental design, and interpretation," he says. "And I get to help them work through all of that."

"With Laurel, I've loved working together to define an interesting problem/challenge and then giving her sufficient intellectual freedom to develop these ideas, while also being available to provide feedback, guidance, and support," he says.

Davis hopes to pass along to students the fearlessness—or perhaps, he says, the naivety—that serves him well in his career. "I want to foster confidence that they can do difficult things," he says. Kinman says Davis has inspired her to incorporate her own passion for mentoring and teaching into her goal of becoming a professor at a large research institute.

Kinman wants to ensure that others have the same positive experiences she's had working with Davis. At MIT, she helped lead a peer mentoring group, BioPals, in the Department of Biology and cofounded the BioLGBTQ+ group, focused on creating a welcoming space for LGBTQ+ individuals and allies. She served on two committees, one Institute-wide and one in the biology department, both tasked with providing concrete recommendations for improving mentorship experiences at MIT.

To Kinman, conducting research and supporting the next generation of scientists are inextricably linked. "There's a lot of data that show that people from traditionally marginalized backgrounds benefit disproportionately from good mentorship," she says. "Other data show that people who have positive mentorship experiences in science report being happier on a personal level and are more likely to persist in working in the field."

"It's very clear," Kinman says, "that improving mentorship leads to dramatically better science."

—Deborah Halber





# To PhD and Beyond

**MIT programs provide a mentorship-paved pathway to doctoral degrees—and a potential launch pad to academia**

Joshua Bennett wasn't sure what to expect coming to MIT on a School of Humanities, Arts, and Social Sciences (SHASS) Diversity Predoctoral Fellowship in 2015, having previously associated the Institute solely with science and engineering. "The only cultural reference I really had for it was *Good Will Hunting*," he admits, referencing the film about a young math genius. "I didn't associate MIT with humanistic study."

Then a PhD candidate in literature at Princeton University, Bennett was intrigued by the SHASS fellowship, which provides a nine-month paid appointment to candidates from underrepresented groups. "It seemed like an incredible opportunity," he says. "And lo and behold, I got here to the literature department and people were doing all sorts of things I found absolutely fascinating."

Bennett, now the author of five books of poetry, criticism, and narrative nonfiction, joined the MIT faculty as professor of literature and Distinguished Chair of the Humanities in summer 2023. During his fellowship eight years ago, he

worked on a dissertation about animal figures in African American literature that became his second book, *Being Property Once Myself*, which was published by Harvard University Press in 2020.

The time at MIT was invaluable, he says, not just because it gave him "space and money to read and write," as he puts it, but also because of the mentorship from faculty such as literature professor Mary Fuller. "Mary modeled for me a vision of mentorship that takes the entire person, and not just the scope of a particular research project, into account. It was always my sense from our conversations that I should be thinking about what I loved in life, and how to cultivate a sense of purpose and joy outside of my work."

Bennett drew further inspiration from the camaraderie of fellow scholars researching topics such as Haitian immigration and patterns of educational attainment by Black mothers and daughters. "My whole year was hanging out with my cohort inside and outside of the department," he says. "It meant a great deal to have a bunch of friends I could turn to, especially as we all began applying for jobs."

From left: PhD students Miles and Malik George '22, participants in the EACS Thriving Stars program, and professor of literature and Distinguished Chair of the Humanities Joshua Bennett.

ILLUSTRATION: LUCY JONES



The distinctive MIT environment ended up inspiring his writing as well. “I think a lot about how my time at MIT changed the way I conceive of my larger intellectual project,” he says. “In one of the books I’m working on now, I’m trying to recover a number of early 20th-century Black scientists who understood the practice of teaching science as part of a larger struggle for racial justice.”

In addition to writing and teaching poetry classes, Bennett is spearheading the People’s Poetry Archive, which he hopes will one day be among the largest archives of Black poetry in the world. “MIT feels like a place for builders, a place where you can bring what you imagine to life,” Bennett says. “In my own way, I’m building something here.”

### Future leaders

Twin brothers Miles and Malik George ’22 showed so much promise in bioengineering as MIT undergraduates that one of their mentors suggested they should apply to graduate school. As the first two members of their New Jersey family to earn undergraduate degrees, however, they had no idea how to pay for it. Through **Laureates and Leaders**, a program of the Office of Minority Education (OME), they got a welcome surprise. “One of the astounding things we learned early on was that a PhD can be paid for,” says Miles. In fact, many STEM PhD students receive funding, according to Greg Jain, OME assistant dean for personal and professional development programs.

It’s that kind of knowledge that the Laureates and Leaders program was set up to provide. Since 2007, the program has helped guide students through the process of applying for PhD and MD/PhD programs, offering mentorship, application workshops, and financial assistance with fees, test prep, and conference travel. To date, some 275 students have graduated from the program. “For some of these students, the possibility of graduate school never crossed their mind,” says Jain. “This program allows them to explore all options and reach their full potential.”

As for Miles and Malik, they are both now first-year doctoral students at MIT, working on issues of agriculture and climate science—and producing popular TikTok videos to teach science to young people. “We’re looking for some way to document our PhD process as a platform to encourage other people like us to pursue research at a higher level.”

### Women in physics, unite

Women in the sciences are used to being in the distinct minority, but what if that were to change? The **Rising Stars in Physics** program sought to answer that question during its inaugural workshop in 2016, which provided standout female doctoral students from MIT and other institutions with the opportunity to spend two days engaging in scientific discussions and networking.

“For most of them, it’s the first time they are in the room with a majority of women in physics,” says Pablo Jarillo-Herrero, the Cecil and Ida Green Professor of Physics,

“I think a lot about how my time at MIT changed the way I conceive of my larger intellectual project,” says Joshua Bennett.

who conceived of and launched the program and then secured a grant from the Heising-Simons Foundation to fund its continuation.

In addition to research presentations, an annual Rising Stars workshop features panel discussions by academic leaders on topics such as applying for jobs and grants, balancing work and family, and collaborating with colleagues. Workshops have been held at peer institutions such as Princeton and Stanford, and the event will return to MIT in 2024.

“We give them a realistic vision of what it’s like working in academia—the pros and cons,” Jarillo-Herrero says. The majority of workshop attendees, he adds, have gone on to academic positions, including MIT associate professor Netta Engelhardt, who researches quantum gravity, and assistant professor Lina Necib PhD ’17, a theoretical astroparticle physicist.

### A “galaxy” of EECS stars

The Department of Electrical Engineering and Computer Science (EECS) undertook a concerted effort years ago to affect its undergraduate gender ratio—now it’s almost evenly split. Yet, the doctoral program remains mostly male. The department launched **Thriving Stars** to help tilt that balance. The initiative aims to reach gender parity within five years through meaningful changes to recruitment, among other things. A key element of this is mentorship. Now, admitted female and nonbinary students are matched with a mentor during EECS Visit Days to answer questions and make them feel welcome.

“It was great chatting with my mentor,” says Rebecca Lin, now a first-year PhD student. “I got her candid thoughts on areas of grad school that mattered to me, and it contributed to me choosing MIT.” Lin still looks forward to seeing the familiar face of her mentor, Jillian Ross, at campus events. A second-year PhD student, Ross mentored several students. “I enjoy being a resource to newly admitted students in any way I can,” she says. “We discuss everything from conducting research to housing experiences to visa challenges.”

The initiative has already made a difference, says EECS graduate officer and professor Leslie Kolodziejski, helping to raise the number of women and nonbinary students in an entering class, which previously hovered between 30 and 40 per year, to 48 this year. “My plan is to create a Thriving Stars ‘galaxy,’” she says. “A big network of women who can connect and hang out with each other at conferences in the field.” —Michael Blanding

# Designing Effective Applications

**MIT graduate architecture students offer guidance to potential applicants from underrepresented groups**

Applying for graduate admission at MIT takes courage. The competition is fierce, and only one in 10 applicants can expect to be offered a spot.

The MIT application process can be even more daunting for students from historically underrepresented groups: racial minorities; students from low-income families; and first-generation applicants. For many of these students, admission to MIT can seem especially out of reach.

Many departments at MIT work to assist applicants from underrepresented groups, each tailoring programs to fit that department's unique profile. In the Department of Architecture, for example, current graduate students work with prospective applicants through the Applicant Mentorship Program (AMP) to help demystify the process. The initiative is part of broader efforts to diversify the graduate student population at the School of Architecture and Planning, building on ongoing activities by the Program in Media Arts & Sciences and the Students

of Color Committee in the Department of Urban Studies and Planning.

"Students at MIT learn just as much from their peers as they do from their professors," says Nicholas de Monchaux, who helped launch AMP after becoming architecture department head in 2020. "By working to achieve the most robust diversity of students, we can help create the most engaging educational environment."

In the architecture program, great weight is given to an applicant's portfolio and statement of purpose, so student mentors advise potential applicants how best to present their work and future plans.

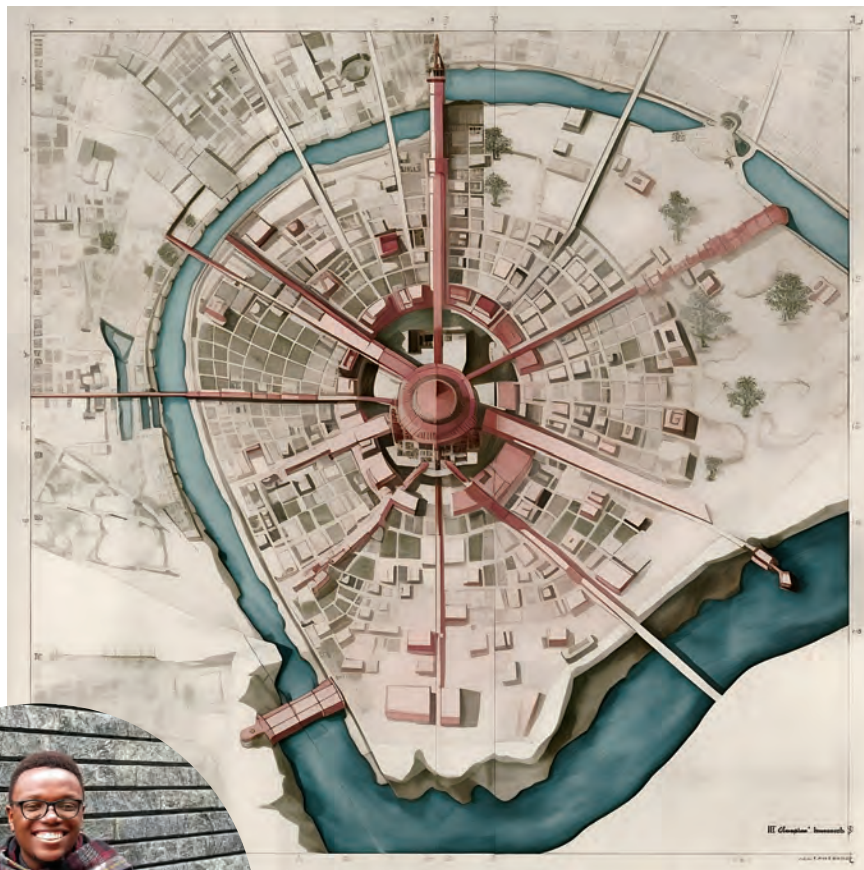
"There are many excellent candidates all across the world," says AMP mentor Geoffrey Mosoti Nyakiongora, a student from Nairobi, Kenya, who is pursuing a master's of science in architecture and urbanism. "But they might not know how to properly present themselves unless they engage with a member of the MIT community. Anyone who accesses this program can substantially increase their chances of admission."

Student mentors in AMP are paid by the department to meet with potential applicants over three five-day intervals scheduled at strategic points during the academic year, and the results have been overwhelmingly positive. In the first two years of the program, approximately 70% of all mentees submitted applications to a program in architecture, and in the first year of the program, 25% of AMP applicants gained admission—a far higher percentage than those from the general applicant pool.

"AMP is only one element of the work we've done here in architecture to address issues of diversity, equity, and belonging," says Terry Knight, a longtime professor in architecture and associate department head for strategy and equity since 2020. "But it's one of the most successful initiatives to date, and one we are quite proud of."

In addition to helping applicants present themselves in the best possible light, the AMP program also strives to find applicants who might not see themselves as potential candidates for admission. "Our goal is to raise awareness about our school and our programs," says Lauren Schuller, the inaugural diversity, equity, and belonging officer at the Department of Architecture. "We want to reach students in certain target groups, students who may not be looking at our website or who don't think they could get into MIT or pay for it if they are admitted."

The AMP program is extremely popular with current architecture graduate students. Student mentors are matched with potential applicants who are interested in their specific programs, and mentors are frequently paired with mentees with similar backgrounds. "Last year I spoke with five potential applicants, four from India, and a fifth from an Indian family who lives in the United States," says Dhvani Mehta, a student in the master of science in architecture studies and urbanism from Mumbai, India. "I think it gives potential applicants a level of comfort. I understand how architecture programs in India work and am familiar with the differences between that system and the one at MIT." —Ken Shulman



In a project called the Mountain of Gold, master's student and AMP mentor Geoffrey Mosoti Nyakiongora analyzed the impact of Jerusalem's Dome of the Rock on the planning, growth, and urban development of the city. In his AMP role, Nyakiongora advises potential applicants on how best to present their work.

IMAGE AND PORTRAIT: COURTESY OF GEOFFREY MOSOTI NYAKIONGORA



# Engineers, Express Yourself

In its 10th year, the MIT School of Engineering Communication Lab helps students translate their work for broader impact

What happens in the lab shouldn't stay in the lab. For a decade, the MIT School of Engineering Communication Lab, which originated in the Department of Biological Engineering and has grown to encompass the school, has empowered students to refine, communicate, and demystify their discoveries for the public. "You could be doing the most interesting science in the world, but if you're unable to explain it in a compelling way, nobody is going to know," says Diana Chien PhD '16, the lab's longtime manager.

In 2013, the Comm Lab's founders, who include Eric Alm, professor of civil and environmental engineering and biological engineering, and Agnieszka Stachowiak '01, PhD '07, a biological engineering technical instructor, developed a one-to-one coaching program where specially trained Communication Fellows provided support for their peers. Graduate student and postdoc coaches, chosen for their scientific and technological acumen and people skills—a treasured combination—continue to form the foundation of today's lab.

"One of our fellows coined a really amazing term: 'optimal intellectual distance,'" says Chien, who became a Communication Fellow while a microbiology graduate student at MIT. "They are well versed in a field but far enough away from the immediacy of the research that they're able to ask just the right level of critical questions."

At the lab, which is housed in the School of Engineering Programs in Technical Leadership and Communication (TLC), students make appointments with a peer coach for help with presentations, graduate school applications, resumes, dissertations, and more. Fellows offer advice and provide camaraderie.

"Over the last 10 years, the Comm Lab, with its model of discipline-specific, time-of-need, peer-to-peer coaching, has had



**"Comm Lab training, as well as practice through coaching, helped me become a more effective communicator," says Katharine Greco.**

significant impact. It has catalyzed the success of so many MIT students and postdocs by honing their communication skills, allowing them to crisply and clearly articulate technical information to a wide variety of audiences," says Reza Rahaman SM '85, PhD '89, the Bernard Gordon Managing Director of TLC.

"There's an element of interpersonal connection," says Chien. "Peer coaches can say, 'Here are things I did to manage stress. Here's how I pulled friends and mentors into my application process.' It becomes a very holistic experience." This perspective is crucial for engineers, who are often so close to their work that it's easy to lose perspective and confidence, adds Chien.

For the lab's 10th anniversary, Chien is coordinating a panel of alumni fellows. One is a climate journalist, another is a White House biotech adviser, and another is training to become an astronaut. "They all say: 'Communication is core to what I do.' Those skills are transferable and applicable to many industries," she says.

Katharine Greco SM '18, PhD '21 is a former fellow and chemical engineer who is now director of technology at the early-stage company Still Bright, which is developing an electrochemical, environmentally friendly way to extract copper metal from ore.

"My experience as a Comm Lab Fellow was extremely fulfilling," she says. "The research and science being pushed forward at MIT is incredible, and helping fellow students communicate the impacts of their work was super rewarding. I also found that the Comm Lab training, as well as practice through coaching, really helped me become a more effective communicator, and I've been able to continue putting these skills into practice in my current role."

While the fellows have pursued exciting careers, Chien is equally proud of their contribution to MIT. "We're seeing an increase in repeat clients, which means that the lab is really becoming part of the MIT culture, which we love. We're trying to normalize the act of asking for help and having conversations," she says. —Kara Baskin

The Comm Lab website houses discipline-specific CommKits that include tools such as templates to help students create displays for all-important poster sessions.

PHOTO: JAKE BELCHER





Nicole Mumbi, a high school apprentice at BioBuilder—which received support from the Venture Mentoring Service—presents her work to industry professionals at a 2022 poster session in BioBuilder’s Learning Lab at Ginkgo Bioworks.

PHOTO: MILEIDY RODRIGUEZ

# Mentors for Life

The Venture Mentoring Service helps MIT entrepreneurs and their ventures to flourish

One of the first things that Don Shobry’s ’75, director of the Venture Mentoring Service (VMS) at MIT, points out is that the name is a bit of a misnomer. “We mentor entrepreneurs,” he explains, “using a real-life venture as a venue for experiential learning, because the best way to learn is by doing.”

Launched in 2000, VMS is open to aspiring entrepreneurs across the MIT community, including students, alumni, faculty, and staff. Services are free, confidential, and tailored to the needs of mentees and their ventures. Each mentee works with a team of VMS mentors, approximately half of whom are MIT alumni. Mentoring teams comprise “a wide cross-section of expertise,” says Shobry, from successful entrepreneurs to experts in adjacent fields like finance, law, and human resources. VMS is focused particularly on the Boston area MIT community, and mentees are encouraged to take advantage of the many programs in the MIT entrepreneurial ecosystem.

“We aim to provide a trusted environment that participants can take advantage of at any point in their career,” says Shobry, himself an entrepreneur and a mentor. “Our motto is ‘VMS for life.’”

## From “reluctant entrepreneur” to passionate leader

Natalie Kuldell has taken that motto to heart. The VMS alumna and founder and CEO of educational nonprofit BioBuilder describes herself as “a reluctant entrepreneur” but, thanks to VMS mentoring, a happy one. When she approached VMS, Kuldell was a faculty member in the MIT Department of Biological Engineering looking for ways to sustain and scale her successful work, supported by the National Science Foundation, to develop transformative biotechnology education.

“Biotechnology is our future,” says Kuldell. She came to VMS with a vision of “a world where everyone’s high school education prepares and inspires them to tackle complex challenges, earn a



family-supporting wage, and understand the world around them.”

BioBuilder, now in its 12th year, is helping to realize that vision by providing high school students, educators, and industry leaders with outstanding, open-source biotechnology programming and education.

Kuldell says VMS mentors helped her consider every aspect of creating a successful organization. Most importantly, they helped her zero in on her personal goals. One pivotal decision was whether to create a for-profit or nonprofit organization; Kuldell’s VMS team helped her select the nonprofit path and develop an open-access model attractive to partners. “They helped me put together the right team,” says Kuldell, while coaching her development as a leader. As BioBuilder grew, she stayed in contact with her VMS mentors and continues to learn from them.

Without VMS, she says, “I would have perpetually been in a reactive mode instead of a proactive one.” Scaling BioBuilder would also have been difficult. “It probably would have remained very boutique—just me, supporting a handful of teachers, as opposed to BioBuilder today,” with a mission of transforming life science education in every US high school. “Working with VMS to create BioBuilder has been one of the most joyful endeavors of my career.”

#### Easing the way for new entrepreneurs

VMS was founded by the late David H. Staelin ’60, SM ’61, ScD ’65, professor of electrical engineering and computer science at MIT, and the late Alexander L. M. Dingee Jr. ’52, an active alumnus and serial entrepreneur, both of whom saw an opportunity to serve MIT entrepreneurs through mentorship.

“Being an entrepreneur is lonely,” says Shobrys. “You’re leading the organization and often going through totally new experiences, while the people sitting across the table from you typically have a lot more knowledge.”

Staelin and Dingee wondered, “Wouldn’t it be helpful if new entrepreneurs had someone to talk to?” he recalls. “Not an investor, or someone trying to sell them services, but someone who could just share information and provide internal guidance?”

Over time, a model of team mentoring centered on the interests of the entrepreneur has evolved at VMS. The mentee’s goals and needs are identified, and a team with relevant skills and experience is assembled. Additional expertise can be added as needs emerge. VMS engagements range from a few meetings to multiple years, and mentees often reconnect with mentors at key inflection points of their careers.

“This program is really driven by altruism,” says Shobrys, noting that VMS receives generous contributions of time and money from mentors and other friends who are passionate about the program. VMS mentors have even teamed up to form companies, and the VMS venture-to-venture email list now includes around 800 founders.

#### A source of educated entrepreneurs for the world

In addition to mentoring, VMS programming includes open office hours with experts, seminars on a range of topics, and collaborations with other MIT programs and external programs like the MassChallenge competition. To share its successful model, VMS has also created a vibrant international community of mentoring programs, working with 122 organizations in 27 states and 27 countries, on every continent except Antarctica.

“VMS is easing the way for the next generation of entrepreneurs and the next generation of great ideas, and doing it in a really cost-effective way,” says Shobrys. “We’re engaging alumni and building relationships between MIT and entrepreneurs early in their careers.” VMS ventures stimulate the economy, create jobs, and bring valuable products to market. Finally, by creating “a source of educated entrepreneurs and fostering mentoring programs elsewhere,” says Shobrys, “VMS is sharing MIT knowledge and expertise on a national and global scale.”

Like many VMS alumni, Kuldell has come full circle, from an eager mentee to a mentor guiding other aspiring entrepreneurs. “I really am just a science nerd,” she says. “I never thought I’d become a social entrepreneur but, boy, am I happy doing it. Every day is just a really good challenge.” —Kris Willcox

## VENTURE MENTORING SERVICE

**4,400**

MIT entrepreneurs

**3,100**

ventures served

**410**

ventures launched

**290**

ventures in the pipeline

Notable VMS-mentored organizations

**Augmental Tech**

**BioBuilder**

**Commonwealth Fusion**

**Hosta a.i.**

**Optimus Ride**

**SurgiBox**

**Vicarious Surgical**

**\$9.8B+**

raised by VMS ventures

(7)

### MENTORSHIP FOR THE HEAD, HEART, AND HANDS

“One question we don’t ask often enough is, ‘How can we help people be authentic leaders?’” says Optimus Ride and limeSHIFT cofounder Jenny Larios Berlin MCP ’14, MBA ’15, an entrepreneur in residence at MIT’s Martin Trust Center for Entrepreneurship.

READ MORE AT

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# J-PAL: 20 Years of Acting on Poverty

MIT lab that transformed development economics marks a milestone

The Abdul Latif Jameel Poverty Action Lab (J-PAL) was founded with a clear mission: to reduce poverty by ensuring that policy is informed by scientific evidence. From scrappy beginnings 20 years ago, J-PAL has grown into a network of more than 750 researchers worldwide rigorously evaluating the most—and least—effective approaches to fighting poverty. It has launched multiple initiatives to concentrate resources around key priorities for policy-makers, launched regional offices, and amassed hundreds of government and nonprofit partnerships to share findings and catalyze the adoption of evidence at scale.

The result: more than half a billion people across the globe have been reached by programs and policies informed by insights from researchers affiliated with J-PAL over the past two decades.

Applying to economics the methodology long used for testing new drugs and medical treatments, J-PAL-affiliated scientists carry out randomized controlled trials that, in the words of J-PAL cofounder and Abdul Latif Jameel Professor of Poverty Alleviation and Development Esther Duflo PhD '99, take “big problems and break them into manageable pieces, smaller questions that admit rigorous answers.” It’s an approach that provides an alternative to “basing decisions on instinct, ideology, or inertia,” says J-PAL global executive director Iqbal Dhaliwal.

In 2019, Duflo; J-PAL cofounder Abhijit Banerjee, the Ford Foundation International Professor of Economics; and longtime affiliate and then Harvard economics professor Michael Kremer were awarded the Nobel Prize in Economic Sciences. The Nobel committee cited the economists’ research that “has considerably improved our ability to fight global poverty” and credited their “new experiment-based approach” with transforming development economics.

Two years after its founding in 2003 by Banerjee, Duflo, and Sendhil Mullainathan, now at the University of Chicago Booth School of Business, what was then known as the MIT Poverty Action Lab partnered with Community Jameel, an organization advancing science to help communities confront pressing challenges. The lab was renamed in honor of the late Abdul Latif Jameel, father of Mohammed Jameel '78, Community Jameel founder and chairman. —Mark Sullivan

## A World of Insights

### UNITED STATES

#### A Federal Office to Bolster Evidence-Based Policymaking

Regional office J-PAL North America contributed in 2015 to the creation of the Office of Evaluation Sciences (OES), whose goal is to “build and use evidence to better serve the public.” Since then, OES has conducted more than 90 evaluations with 20 federal agencies and impacted policymaking across a range of sectors. J-PAL staff and affiliates continue to partner with OES.

#### Promoting Housing Choice to Improve Economic Mobility

Evidence from a flagship randomized evaluation to test the impact of offering rental assistance to help families living in high-poverty neighborhoods move to low-poverty areas provided the impetus for several policy changes at local and federal levels to expand housing choice for families with low incomes.

### PERU

#### Government Innovation Lab to Improve Education

With support from J-PAL, Peru’s Ministry of Education created MineduLAB, a unit to identify, test, and scale low-cost interventions to improve educational outcomes. MineduLAB has conducted nine randomized evaluations and committed to scaling up three programs. It has also informed the design of similar innovation laboratories in Latin America.

### CHILE

#### Information and Enforcement to Reduce Overfishing

Evidence from a randomized evaluation and cost-effectiveness analysis led the Chilean government to expand a consumer information campaign to prevent the overfishing of Pacific hake, which presents a formidable environmental and economic challenge. The study found that awareness campaigns and vendor enforcement strategies helped reduce the availability of illegal hake in local markets.



# 1,640+

## EVALUATIONS

by researchers in J-PAL's network across 95 countries have identified region-specific, context-appropriate policy solutions worldwide.

# 28

## INITIATIVES

identify evidence gaps on key policy priorities; fund research through a competitive, peer-reviewed grant-making process; and engage with policymakers.

# 7

## REGIONAL OFFICES

hosted at universities around the world lead regional research, policy engagement, and training.

# 750+

## RESEARCHERS IN THE J-PAL NETWORK

based at universities worldwide are united in their use of randomized evaluations to design, test, and inform adoption at scale of programs and policies aimed at reducing poverty.

# 50K+

## ONLINE LEARNERS

reached by J-PAL's MicroMasters program in Data, Economics, and Design of Policy, in collaboration with MITx and the MIT Department of Economics. Participants represent 214 countries and territories.



### FRANCE



#### Unintended Effects of Anonymous Résumés

The French government, which had been looking for effective ways to counteract discrimination in labor markets, abandoned a policy that would have required firms to make recruitment decisions based on anonymized résumés after research showed that a voluntary pilot scheme actually harmed underrepresented applicants' employment chances.

### INDIA

#### Clean Cookstoves Program Flickers Out

A global campaign backed by the United Nations sought to reduce indoor air pollution by replacing open-fire cooking with less polluting stoves. J-PAL field researchers in India found the new cookstoves did not reduce smoke exposure, improve health, or reduce fuel usage. The policy lessons: identifying the right technology is key, and new approaches need to be tested in real-world conditions over extended periods before they are widely adopted.



### KENYA



#### Deworming to Increase School Attendance

After research by J-PAL affiliates found that school-based distribution of deworming pills in areas of Kenya with high rates of child intestinal worm infection boosted health and school attendance, the approach has been scaled to reach more than 280 million children. J-PAL research has since led to the launch of similar efforts in Ethiopia, India, Kenya, Nigeria, and Vietnam.

### INDONESIA



#### How Debit Cards Helped the Poor Obtain More Food

For years, the Indonesian government sent bags of rice to villages, where leaders were supposed to distribute them to poor residents. However, people received the full intended amount only 24% of the time. When recipients were instead sent debit cards to buy food themselves, millions of Indonesians started receiving the intended amount 81% of the time. According to a study co-led by J-PAL economists, for the poorest 15% of households, this switch to debit cards reduced the overall poverty rate by 20%.



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Jay Stein PhD '68 and Amy Keating, the Jay A. Stein Professor of Biology.

PHOTO: SIMON SIMARD

# Passing the Baton of Science

Hologic-funded Jay A. Stein Professorship of Biology celebrates MIT innovation across generations

Jay Stein PhD '68 came to MIT as a doctoral student in physics to study the composition of stars using x-rays. Though he was interested in astronomical objects, he was even more fascinated by the tools of his trade. "I found that I enjoyed building the equipment to measure stars more than finding out what was happening in the stars," he recalls. Stein spent the next several decades creating innovative tools to solve complex problems. In 1985, he cofounded Hologic, a health technology company that has had a profound impact on medicine. Among Hologic's many achievements are groundbreaking diagnostic and screening technologies that have reshaped the field of mammography.

Last fall, at Stein's retirement party, friends and colleagues surprised him with a very special gift: the Jay A. Stein Professorship of Biology at MIT, established by Hologic. "It was the perfect gift," says Stein. "The greatest compliment of all was that my colleagues understood me so well." Through the professorship, Stein says he has been given "a permanent link to the future" and to MIT innovators.

The inaugural Jay A. Stein Professor of Biology is Amy Keating, head of the Department of Biology and a noted leader in the field of biological engineering. Keating, who is also a member of the Koch Institute for Integrative Cancer Research, uses computational techniques to study protein structure, function, and interactions and to design molecules that can be used to probe and disrupt processes relevant to human disease.

Monica Aguirre, vice president and chief of staff at Hologic, considers Stein both a colleague and a dear friend. She says it was an honor to plan his retirement celebration and the Stein Professorship, adding that "Jay has made a lasting impression on almost everyone he's worked with." She describes him as possessing the inquisitive spirit of an inventor (he has more than 100 patents to his name), the grit of a hands-on collaborator, and the generosity of a mentor. "He's a true leader, inside and out."

When considering Stein's retirement gift, says Aguirre, "we knew it needed to be something lasting, that would impact many lives, and we knew it had to be MIT, because he loves MIT deeply." By supporting

faculty, the gift supports individuals whose careers, like Stein's, will have "a ripple effect in the world," according to Aguirre, who points out that the Stein Professorship also reflects Hologic's values: "Our mission is to encourage innovation, with the goal of doing good for people. That is what Jay did, and it's the foundation of who we are at Hologic."

## Follow the nerd, not the herd

Stein says it was MIT's culture of "open-minded acceptance" that enabled him to pivot from physics to biomedical technology. He credits MIT faculty mentors with inspiring him to follow his curiosity. He also prized the mentorship of MIT technicians and machinists who taught him the value of finding the right tool for every job, and of taking the time to do the job right.

Stein's personal motto is one that any MIT alum can appreciate: "The secret of innovation is simply this: Follow the nerd, not the herd."

Today, Stein remains a trusted partner to Hologic's leaders, offering suggestions and ideas at quarterly meetings (written recaps of these reflections are titled, affectionately, "The Word from the Nerd") and has recently rejoined Hologic as a consultant on a project to develop new techniques for painless mammography. As he continues to follow his path of innovation, the Stein Professorship offers him a permanent link to the Institute, and to leading faculty like Amy Keating. According to Stein, the professorship "is a way to pass the baton of science, from one generation to the next—hopefully, forever."

—Kris Willcox



## PROTEIN POWER

Amy Keating's lab draws on advances in computational tools to explore creating proteins from scratch.

[betterworld.mit.edu/spectrum/keating](https://betterworld.mit.edu/spectrum/keating)



# Expanding Student Horizons

## Naming gift from Henri Slezynger boosts MIT-Brazil Program

Henri Slezynger '57, SM '58 was two years old when his family escaped the war descending on Europe by emigrating to South America. "The family thought they should leave Belgium," Slezynger recalls from his home in São Paulo. "My grandfather was dispatched to Brazil to see if it was a civilized place; this was 1939, and Brazil was an unknown quantity to Europeans. He went to São Paulo and wrote back, 'It's a very worthy place.' So, everybody decided to come. There was a ship with about 30 of us.

"We were lucky to get out, and we did well here," continues Slezynger, who went on to be the only undergraduate from Brazil in his MIT class and is now the chairman of Unigel, one of Latin America's largest chemical companies. A generous advocate of strengthened ties between his alma mater and his adopted homeland, he recently pledged to endow the MIT-Brazil Program, which is to be renamed in his honor.

The MIT-Brazil Program matches MIT students with projects in Brazil through the MIT International Science and Technology Initiatives (MISTI). MISTI Brazil provides opportunities for students to participate in MIT Global Teaching Labs and internships in industry and university research labs.

Noting that MIT's chemical engineering program was key to his success, Slezynger hopes "to influence some new Brazilian talents to also be successful, if possible, in the field of chemical engineering."

Previously, Slezynger and his wife, Dora, established a career development assistant professorship in chemical engineering. "MIT has been very important to my life and career," Slezynger says. "I felt I should pay MIT back for all the success it has helped me obtain. I started by giving support to a professorship, which was very well filled by Connor Coley [SM '16, PhD '19], who is doing good work.

"My foundation is concentrating on education and health, and I was very taken by the MISTI project in Brazil," he adds. "It impressed me that the program intends to help Brazil by sending people here, trying to help the country evolve, and training worthy candidates."

Reflecting on his career path, Slezynger recalls an internship at Bethlehem Steel during his graduate studies, which required him to cope with hot furnaces and exposure to coke, a fuel used in steel manufacturing. "The coke got on my skin, and it was very difficult to get rid of. I decided that when I started looking for jobs, I'd go to a clean industry."

After MIT, he took a position with the pharmaceutical company Pfizer, working in both the United States and Brazil. In 1966, he founded what is now Unigel.

Unigel broke ground last year on what the company said would be the world's largest facility to produce "green hydrogen," generated using renewable or low-carbon energy. Green hydrogen is seen as a promising clean-energy alternative to fossil fuels.

The company plans to invest up to \$1.5 billion in the facility, which expects to turn out 10,000 tons of green hydrogen and 60,000 tons of green ammonia annually by the end of 2023. The goal is to produce 10 times those amounts by 2027, according to Unigel.

Slezynger said he hopes that his company's green hydrogen venture will offer opportunities in the future to students in the MISTI Brazil Program. "Green hydrogen is new, and there is a lot of research and work to be done in this field," he reflects. "I would advise future chemical engineers to continue their efforts in this area. We're all looking for a better world, a cleaner world, and I'm sure they can contribute." —Mark Sullivan

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### LIFE-CHANGING ALL AROUND

"It was mad fun talking with them and teaching them," says Leeban Morgan '25 of the 34 high schoolers he engaged with through a MIT-Brazil Global Teaching Lab program in Mossoró, Brazil, in January 2023.

READ MORE AT  
[betterworld.mit.edu/spectrum/morgan](https://betterworld.mit.edu/spectrum/morgan)

Brazilian high-schoolers, guided by MIT students, designed and built a remote-controlled vehicle to explore the semiarid landscape of northeastern Brazil.

PHOTOS: FELIPE RIBEIRO/UFERSA (LEFT); VICTOR AFFARO (ABOVE)

# Spectrum

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## A BIG YEAR FOR NANO

Xi Chen, a graduate student in materials science and engineering, loads a sample into the Themis Z G3, an aberration-corrected scanning transmission electron microscope at MIT.nano, housed in the Lisa T. Su Building. In her research in the lab of Associate Professor James Lebeau, Chen employs electron microscopy to study thermal vibrations at the atomic scale. The Themis—capable of making videos of atoms in motion—is one of the 180 tools and instruments available to researchers at MIT.nano, which celebrated its fifth anniversary in October 2023 as the Institute's central facility for nanoscale science and engineering.

PHOTO: KEN RICHARDSON



FOR A BETTER WORLD