

# Spectrum



**The  
Whole  
Student  
Experience**



PHOTO: TAYLOR TRACY

(7)  
**CREATING OPPORTUNITIES THROUGH SERVICE**

Wilhem Hector '25 is a mechanical engineering major with a passion for wind energy and for service. "The community here has helped establish that public service element within my undergraduate career, and I'm very grateful for that."

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

(7)  
**INSPIRED BY THE FUTURE OF NUCLEAR POWER**

Sara Hauptman '19, a first-year PhD student in nuclear science and engineering, is working on the design for a next-generation reactor. "I still get that excited feeling in my gut about this technology."

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

**Wide Angle**

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**Subjects**

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4 An up-close look at Instrumentation and Measurement for Biological Systems

**FRONT COVER**

Incoming MIT students participate in an egg drop challenge on campus as part of a Pre-Orientation Program called Discover Chemical Engineering. During the program, students explore the principles of engineering and chemistry and engage in teamwork, critical thinking, and problem solving—crucial components of a "whole student" education at MIT.

PHOTO: SARAH BASTILLE

**The Whole Student Experience**

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## Fall 2024

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**MIT Spectrum** connects friends and supporters of the Massachusetts Institute of Technology to MIT's vision, impact, and exceptional community.

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

**“MIT students are explorers, endlessly curious about the intellectual subjects that interest them, from quantum computing to urban planning, bioengineering to political science to entrepreneurship. That spirit of exploration inspires them outside the classroom, too, as they dive into music and performing arts, sports, public service, and countless social activities and residential programs. An MIT education is challenging and intense, and we take very seriously our responsibility to help the ‘whole student’ thrive.”**

**SALLY KORNBLUTH**



# Mission: Climate

**MIT faculty focus their expertise and energy on changing the course of climate outcomes**

In February 2024, MIT announced the Climate Project, an Institute-wide response to climate change, drawing on MIT's expertise and signature interdisciplinary approach to problem-solving. The effort's goal is to change the expected course of global climate outcomes for the better within 10 years.

Seven MIT faculty members representing diverse areas of expertise are now at the forefront of the effort. They are the Climate Project's mission directors, focusing the Institute's strengths on six areas that represent some of the toughest problems standing in the way of an effective global climate response.

- Decarbonizing energy and industry: Supporting improvements to the electric power grid and the transition of all industry to low-emission pathways.
- Restoring the atmosphere, protecting the land and oceans: Removing or storing greenhouse gases already emitted into the atmosphere, and protecting ocean and land ecosystems.

- Empowering frontline communities: Developing climate solutions in support of the world's most vulnerable populations.
- Building and adapting healthy, resilient cities: Designing urban solutions to a new climate reality, and working on transportation, infrastructure, and finance.
- Inventing new policy approaches: Creating new institutional structures and incentives, including in carbon markets, finance, and trade policy.
- Wild cards: Seeking out unconventional solutions and unorthodox approaches to climate challenges.

The mission leaders are collaborating with faculty and researchers across MIT, as well as each other. According to MIT President Sally Kornbluth, "they will be absolutely central as the Climate Project seeks to marshal the Institute's talent and resources to research, develop, deploy, and scale up serious solutions to help change the planet's climate trajectory."

—Christine Thielman

# Meet the Mission Leaders



## **Decarbonizing energy and industry**

Elsa Olivetti PhD '07, the Jerry McAfee Professor in Engineering



## **Restoring the atmosphere, protecting the land and oceans**

Andrew Babbin, associate professor of chemical oceanography and marine microbiology



Jesse Kroll, the Peter de Florez Professor in the Department of Civil and Environmental Engineering, a professor of chemical engineering, and the director of the Ralph M. Parsons Laboratory



## **Empowering frontline communities**

Miho Mazereeuw, the Mark Hyman, Jr. Career Development Professor of architecture and urbanism and director of MIT's Urban Risk Lab



## **Building and adapting healthy, resilient cities**

Christoph Reinhart, the Alan and Terri Spoon Professor of Architecture and Climate



## **Inventing new policy approaches**

Christopher Knittel, the George P. Shultz Professor of Applied Economics at MIT Sloan, associate dean for climate and sustainability, and director of the MIT Climate Policy Center



## **Wild cards**

Benedetto Marelli, associate professor in the Department of Civil and Environmental Engineering



## **SUPPORT AND LEARN MORE ABOUT THE CLIMATE PROJECT**

[betterworld.mit.edu/the-climate-project](https://betterworld.mit.edu/the-climate-project)



# Microscopy and the Big Picture

Students build their own microscopes and expand their interdisciplinary skills through coding, modeling, and circuitry in this cornerstone biological engineering course

## TITLE

### 20.309 Instrumentation and Measurement for Biological Systems

## INSTRUCTORS

Maxine Jonas PhD '07, Steven Wasserman '88 (Spring 2024)

Students construct their microscopes using a kit, so they have time to conduct experiments. "We build microscopes with specialized applications that are used by people in real research labs, so students become familiar with the suppliers and what they may purchase for their own labs in the future," says Senior Lecturer Maxine Jonas.

## FROM THE CATALOG

Quantitative measurement underpins many significant advancements in biological science and engineering, highlighting the central role of cutting-edge measurement techniques. In the context of measurement, 20.309 explores the intricate relationship between measuring, manipulating, and modeling biological systems. Lectures cover the application of engineering techniques such as statistics, signal processing, system identification, and control theory to biological systems. Lab sessions focus on optical methods and electronics. Fundamental topics include measurement error and the limits of precision and accuracy.

## CLASS STRUCTURE

"People call it 'the microscope class,'" says Jenna Houle '25, "but now that I've taken it, I can see that there's so much more to it. I hadn't learned microscopy formally before this, and it's great to have it as a tool in my toolkit now."

Houle, a double major in biological engineering and materials science and engineering who conducts research at MIT's Koch Institute for Integrative Cancer Research, is referring to 20.309 Instrumentation and Measurement for Biological Systems, a required class for all biological engineering majors. In it, students **construct a microscope** and use it for experiments using mammalian and yeast cells, while also expanding their interdisciplinary engineering vocabulary through coding, modeling, and circuitry.

The class is a cornerstone of the undergraduate biological engineering program that was established at MIT in 2005. Senior Lecturer Maxine Jonas PhD '07 has been teaching the class since 2013, when she returned to MIT after working in the pharmaceutical and biotech industry.

"It's a very special class," Jonas says, noting its hands-on nature and how different facets of engineering and physics come together to form the curriculum. "Students are empowered to tell the whole story, from the design of their experiment

to the implementation to the data analysis. They develop a practice of incremental improvement that engineers use, again and again, to design, build, test, and refine.”

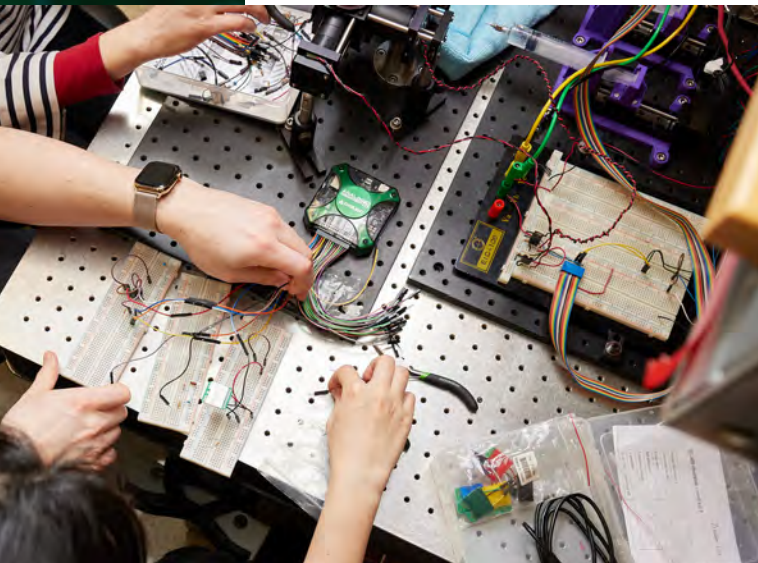
### An evolving lens

One strength of the class comes from its ability to shift with cutting-edge research and pull from the knowledge base of the entire MIT community. When microfluidics research became popular in the Department of Biological Engineering, Jonas and her fellow instructors took note. “What we invented and developed in the class, in partnership with some professors whose research is based on microfluidics, was a new system where the students expose yeast cells to varying salt concentrations,” she explains. “We always want to bring it back to modeling biology and understanding how the biological system responds.”

While technologies evolve over the years—students now use 3-D printers and laser cutters for some projects—microscopy is a constant. “Compared to a lot of other investigative methods, microscopy is remarkably intuitive,” says Isaac Lock ’25, who is currently at the Whitehead Institute for Biomedical Research through the Undergraduate Research Opportunities Program and has a **double major in biological engineering and philosophy**. “Zooming in is a useful way just to gain the type of fundamental knowledge you need to understand other experiments as well.”

“Even though forms of microscopy have been around for about 400 years—and we teach students a little bit of the history—it’s still crucial to the advancement of biology and biological engineering,” says Jonas. “There’s still so much that is observed one protein or one gene at a time.”

Lock: “I think the most interesting intersection between my majors is in the realm of bioethics, which is a natural combination of any sort of biological science and a philosophy. But there’s also the philosophy of knowledge: How do we even know things? That relates directly to observation, which came up a lot in this class. How do you actually know that what you’re seeing is real and isn’t just noise, or some aberration of the signal?”



Jonas: “I had a good memory of MIT. I like how people can be very original, very witty, very weird. I feel that at MIT, people give their best and want to really do the best they can for their job, for their team. It pushes you to also give your best and be there for others.”

### Popping the “molecular scale bubble”

It’s the interdisciplinary nature of the class, says Houle, that makes “the microscope class” almost a misnomer. For example, the hands-on nature of the syllabus is a welcome change of pace for most biological engineering students. “Everything I do in most of my research is moving one clear liquid to a tube of another clear liquid. Look what I made, and that was months of work!” laughs Houle. “This class gets us out of our molecular-scale bubble. You build something with your hands that you can see at the end.”

Isabella Gandara ’25 could see the parallels for gene expression in her research. “I want to do epigenetics research as it relates to public health and see how our genome is affected by different environmental exposures,” she says. “I was initially worried about having to relearn the physics and differential equations needed for the class, but it wasn’t about relearning—it was about developing an intuition for the concepts and putting them into action. We were all really inspired and encouraged by the amazing teaching staff to think about how we can apply these concepts to our own work, and our lives in general.”

After working in industry, Jonas strives to put practical components into the class that students will recognize in their future professional lives. It was her experience teaching clients to use large robotic instruments, as well as her teaching assistant days as a graduate student at MIT, that **drew her back to the Institute as an instructor**. “We want to teach students the fundamentals so that when they encounter a complex microscope, they understand how it works. Because once you know the basics, you can just translate this to more complex systems,” she says.

It was the practical components, as well as the interdisciplinary focus, that Lock found most interesting. “This class showed me why interdisciplinary thinking is really, really important. We introduced concepts from across disciplines that I never would’ve imagined using,” he says. “Applying these radically different fields to a biological system proved to be incredibly useful.” —Joelle Carson

the  
whole  
student  
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**What does it mean to educate the “whole student” at MIT? It’s encouraging students to ask themselves, “What do I want to do with my time at the Institute?” It’s creating a culture that encourages students to balance academics with hands-on learning, fun, food, athletics, the arts, well-being, and community. It’s shaping engaged, global citizens who are well prepared to live lives of meaning and impact.**

**nce**



# Educating the Whole Student at MIT

**MIT Chancellor Melissa Nobles, who is also the Class of 1922 Professor of Political Science, talks with Daniel Griffin, the director of development strategies and communications in the Office of the Chancellor, about her role at MIT and the Institute's emphasis on supporting students in every aspect of their lives.**

**DG: You have been MIT chancellor for a little over three years. What have you reflected upon most during that time?**

**MN:** I am fortunate to have engaged with our talented students over every phase of my career at MIT, from serving as a faculty member in the Department of Political Science, then as department head, later as dean of the School of Humanities, Arts, and Social Sciences, and now as chancellor. This path has provided me with unique insight into the perspectives and experiences of our students in and outside the classroom. I am continually inspired and amazed by their curiosity, ingenuity, passion, and tenacity. Their drive to challenge themselves and each other is infectious and constitutes a key ingredient in MIT's "secret sauce."

It is therefore more important than ever that the well-being of our students remains at the center of our work. The world-class

teaching, learning, and research that is MIT's hallmark cannot be sustained without also preparing our students for life after MIT. We provide the opportunities, services, and support that empower our students to meet the demanding requirements of an MIT education while also providing them with the tools to become happier, healthier, and more successful individuals. In short, we want our students to thrive—that is what it means to educate the whole student.

**DG: What are the primary elements of educating the whole student?**

**MN:** There are three key elements in our approach: supporting academic success, fostering community and well-being, and cultivating personal and intellectual growth. We want students to gain a deeper understanding of themselves and the world around them as they drink from the proverbial MIT

firehose. We help them uncover new passions and embrace new experiences as they learn to care for themselves physically, emotionally, and spiritually.

A good example of this work is the collaboration between the Wellbeing Lab (see story on page 18) and the Department of Athletics, Physical Education and Recreation, which provides programming that benefits the overall well-being of our students and the broader community through yoga classes, drop-in sessions with nutritionists and personal trainers, group exercise classes, and massage therapy. We continue to seek ways of weaving well-being—and access to a rich and fulfilling spectrum of experiences—into student life.

**DG: The concept of educating the whole student is championed by liberal arts institutions across the United States. How is it different here at MIT?**



Chancellor Melissa Nobles  
with MIT students.

PHOTO: GRETCHEN ERTL

**MN:** We are building on decades of transformative work across MIT seeking to improve the student experience and ensuring that our humanity remains at the core of our educational values. MIT is world-renowned for our academics and research, especially in science and technology. However, academic excellence and pathbreaking research ultimately depend on, and are carried forward by, talented individuals who require the same level of investment and attention that academic disciplines receive. Striking this balance has been a challenge for MIT historically. We need to continue making purposeful efforts to imbue our culture and educational mission with a focus on those who make it all possible.

Another way to think about educating the whole student is focusing on what we refer to as the three P's: people, places, and programs. Of those three, the first "P" is the most important ... people. That is why ensuring access to an MIT education remains a top priority for my office and a key component of the Whole Student Initiative. Scholarships are awarded based solely on financial need, and close to two-thirds of all undergraduates receive some form of scholarship support during their four years here. Enhancing our ability to provide scholarships will continue to be a key priority for my office moving forward, as we seek to ensure that an individual's financial situation does not create a barrier to experiencing all that MIT has to offer.

**DG:** Can you expand on how "places" affect our students?

**MN:** Learning is not exclusive to the classroom or lab; students learn and grow through all aspects of their MIT experience, and we must ensure that our campus facilitates such learning. From casual conversations over foosball, pizza, or table tennis to late-night problem sets, team meetings, and study groups, our built environment must enable unstructured and organic interactions to help students learn from one another and about themselves.

Over the past year we completed renovations to the Stratton Student Center, which houses our Wellbeing Lab and dance studio, and reopened an enhanced and entirely redesigned Sports Performance Center. These improvements are having a tremendous and positive impact on the student experience. Looking ahead to the fall of 2025, we will open the Undergraduate Advising Center in a central location along the Infinite Corridor. In that space, students can seek guidance from advisors assigned to each of them and find resources as they navigate through their MIT journey (see more on page 23).

We also recently opened the West Campus Graduate Junction residence, significantly increasing the number of on-campus apartments available to graduate students. There's also a comprehensive renovation of East campus taking place and a planned renewal of McCormick Hall.

This work continues in earnest as our residences, athletic fields, dining halls, and study spaces require consistent investment to ensure that MIT's world-class education has the facilities to match.

**DG:** MIT students must meet demanding academic requirements. How can they balance that with self-care and still excel?

**MN:** We have invested heavily in efforts to support our students holistically. From the Wellbeing Lab, currently in its second year of operation, to the Division of Student Life's DoingWell program, with its broader focus on educating students about self-care and instilling a sense of belonging, we continue to put the whole student at the center of each individual's journey through MIT. Educating the whole student does not interfere with or take away from the academic rigor of the MIT experience. Indeed, it's quite the opposite. A well-rested, nourished, and socially connected student will perform better in the classroom and lab, and it is our job to make sure that is the norm, not the exception.

Moreover, well-being is not only an Institute priority; it is also a priority of our incoming students and their parents, who have expectations about student well-being, socialization, and personal growth. Remaining a global leader in academics and research is simply not enough, and I believe we can do more.

**DG:** Is there anything else you would like readers to know about our work?

**MN:** We will continue to support our students' development each and every day, while also building community and a sense of belonging so that they have the skills and perspectives necessary to succeed as students and in life. This important work requires partners across all areas of MIT, and I welcome the opportunity to connect with anyone interested in learning more about how they can engage with us to help move these critical initiatives forward.

## Student Life as a Launchpad

**Suzu Nelson is the vice chancellor and dean for student life at MIT, overseeing the Division of Student Life. Here's how she views her mission.**

"The experiences students enjoy outside the classroom and lab help prepare them for life at MIT and beyond. The opportunities to get those experiences are almost as

limitless as our students' imaginations.

"We have more than 500 student groups and countless other ways for a student to get involved in campus life. Perhaps they are a student-athlete or serving on the government of their residence hall, fraternity, sorority, or independent living group. Maybe they are mentoring new students or promoting wellness through an

organization like MindHandHeart.

However they choose to participate, students stand to learn invaluable lessons about leadership, teamwork, and well-being while forging relationships that can last a lifetime.

"MIT is known for bold ideas. Student life at MIT provides launchpads for those ideas, making the student experience here a laboratory for personal growth and



achievement. 'We are here for students' is more than the Division of Student Life's motto — it's our pledge to support students and help ensure a vibrant and singularly MIT experience for everyone who seeks an education at the Institute now and in the future."

# The Many Paths Through MIT

No two undergraduate student journeys at MIT are exactly alike, but in the following conversations with four current students and two recent graduates—all scholarship recipients—we find common threads: living and learning paths paved with formative experiences, eye-opening classes and extracurriculars, and financial support that have helped shape lives and aspirations.

—Interviews conducted by Kara Baskin and Joelle Carson

93%

of the Class of 2023 participated in the Undergraduate Research Opportunities Program

## Desmond Edwards '22

Biological Engineering (Course 20) and Biology (Course 7)

“Ever since I was younger, I haven’t liked *not* understanding things,” says Desmond Edwards ’22. Growing up hearing both English and Patois in rural Jamaica, he always had an interest in understanding other languages, so he studied French in high school and minored in it at MIT. As a child with persistent illnesses, he was frustrated that doctors couldn’t explain the “how” and “why” of what was happening in his body. “I wanted to understand how an entity so small that we can’t even see it with most microscopes is able to get into a massively intricate human body and completely shut it down in a matter of days,” he says.

Edwards, now an MIT graduate and a PhD candidate in microbiology and immunology at Stanford University — with a deferred MD admission in hand as well — feels closer to understanding things. The financial support he received at MIT from the Class of 1975 Scholarship Fund, he says, was one major reason that he chose MIT.

### Support for research and discovery

I took a three-week Independent Activities Period boot camp designed to expose first-years with little or no research background to basic molecular biology and microbiology techniques. We had guidance from the professor and teaching assistants, but it was up to us what path we took. That intellectual freedom was part of what made me fall in love with academic research. The lecturer, Mandana Sassanfar, made it her personal mission to connect interested students to Undergraduate Research Opportunities Program (UROP) placements, which is how I found myself in Professor Rebecca Lamason’s lab.

At the end of my first year, I debated whether to prioritize my academic research projects or leave for a higher-paying summer internship. My lab helped me apply for the Peter J. Eloranta Summer Undergraduate Research Fellowship, which provided funding that allowed me to stay for the summer, and I ended up staying in the lab for the rest of my time at MIT. One paper I coauthored (about developing new genetic tools to control pathogenic bacteria’s gene expression) was published this year.

Desmond Edwards.

PHOTO: CHRISTIE HEMM KLOK

### French connections

French is one of the working languages of many global health programs, and being able to read documents in their original language has been helpful because many diseases that I care about impact Francophone countries like those in sub-Saharan and west Africa. In one French class, we had to analyze an original primary historical text, so I was able to look at an outbreak of plague in the 18th century and compare their public health response with ours to Covid-19. My MIT French classes have been useful in some very cool ways that I did not anticipate.

### Translating medicine for the masses

When I go home and talk about my research, I often adapt folk stories, analogies, and relatable everyday situations to get points across since there might not be exact Patois words or phrases to directly convey what I'm describing. Taking these scientific concepts and breaking them all into bite-size pieces is important for the general American public too. I want to lead a scientific career that not only advances our understanding and treatment of infectious diseases, but also positively impacts policy, education, and outreach. Right now, this looks like a combination of being an academic/medical professor and eventually leading the Centers for Disease Control and Prevention.



## Iselle Barrios '25

Chemical Engineering (Course 10)

Iselle Barrios's passion for the environment deepened when she took two intensive classes at the MIT Introduction to Technology, Engineering, and Science (MITES) semester



Iselle in Mongolia in front of a ger home.

PHOTO: COURTESY OF ISELLE BARRIOS

program during high school. "I wanted to apply to MIT because of that experience," she says. Once accepted, she participated in Interphase EDGE/x, a two-year program that provides a summer session as well as programming during the academic year that gives students a launch pad for the college experience (see story on page 30). Financial support from the Robert T. Haslam Scholarship Fund, she says, was also instrumental to bringing her to MIT. "I could not have attended MIT without the scholarship, so I'm extremely grateful for that."

### Terrascope and sustainability solutions

Before coming to MIT, I became interested in looking at what can we *do* about climate change to mitigate its impact. I was able to start that right away in Terrascope, a learning community where about 50 first-years take a class that gives them a complex sustainability challenge. The first couple of weeks have some structure, but after that, it's up to you as a class how you want to approach the challenge. Students are given the kind of autonomy that you don't normally get in a first-year class. You learn a lot about the subject area, but also how to work with other people and consider different angles of a problem. I've enjoyed coming back to work as an undergraduate teaching fellow for the last couple of years.

### Anthropology pivot

One anthropology class, 21A.501 Anthro-Engineering Decarbonization at the Million-Person Scale, totally changed my outlook.

The class focuses on the air pollution levels in Ulaanbaatar, the capital of Mongolia, which are over 100 times the World Health Organization's recommended level. We worked with the idea of a molten salt heat brick which you could fuel by using waste heat from the coal-burning power plants and traveled to Mongolia during the following Independent Activities Period. The trip included some testing but it mostly focused on talking to people who live in the affected districts, policymakers, and all kinds of stakeholders, getting a bunch of different viewpoints on the issue. I had never been exposed to anthropology before, but that perspective has been incredibly valuable for me.

### Exploring policy in Washington, DC

During my time at MIT, I've become interested in a career in policy and trying to make change on the issues that I care about—not necessarily in a hard science and technology career, but using the STEM background that I have in a more social science-type of field. I enrolled in the MIT Washington Summer Internship Program, which is designed to expose MIT students to the policy environment in Washington, DC, in the summer of 2024. One of the big components is an internship at a policy-related organization. I had an internship at the Union of Concerned Scientists, which was a great fit for my interests—I could see more clearly how my scientific background could potentially come into play at the policy level.



## Cesar Meza '25

Aerospace Engineering  
(Course 16)

Cesar Meza '25 is candid about his transition to MIT from high school: the work was hard, and all-nighters didn't always pay off. He found a supportive community among his Catholic peers, in the Sport Taekwondo Club, and through UROP, where he studies lunar soil in the Department of Aeronautics and Astronautics. These opportunities, he says, would have been out of reach without support from the Viterbi Family Scholarship. "This support has been monumental in funding my education and has allowed me to focus on pursuing research that I am passionate about, rather than worrying about how to pay for school," he says.

### Ambitions of space

I was always interested in space travel. When my parents took me to the Kennedy Space Center in Florida as a toddler, I was absolutely blown away by the massive rockets. After that experience, I would watch Apollo footage in my room and read anything I could about space. That's what really got me into STEM and engineering.

I knew MIT had a hands-on culture. So, before I started, I reached out to Professor [of the Practice] Jeffrey Hoffman because I wanted to research technologies for space travel. I cold-emailed, saying, "Hi, I'm a rising freshman. Can I work in your lab in the fall?" From there, I was able to UROP in his lab.

### More to life than grades

In high school, I would put in a certain amount of time and effort and get a good grade. I could stay up all night working on something. I tried that my first year at

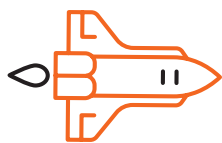
MIT, and quickly realized it was a completely different game. To be honest, it made me feel miserable! I didn't know what my work was worth. But the UROP program was a great experience that helped me get through. I was paired with a graduate student mentor who gave me hands-on work doing testing and validation for an Antarctic Seismo-Geodetic Ice Penetrator—imagine a missile without propulsion, dropped from a plane or helicopter to measure forces acting on the ice sheets. This really kept me going, because it reminded me that classes weren't everything.

I am also engaged with the Catholic community on campus and joined the MIT Sport Taekwondo team my first year. Even when I was getting an average of four hours of sleep a night and thought that I was one of the worst students at MIT, these folks would remind me that this was not true. I owe a lot to my faith and the people around me.

### The importance of charting your own path

Coming to MIT, I knew everyone would be smart, but I didn't expect people to be so kind and compassionate. I have friends who are absolute geniuses, yet they can look at me and say, "Wow. You're doing all this cool stuff." If they could look at me and be impressed, why couldn't I do the same thing with myself?

I struggled a lot with imposter syndrome. It took me three years to finally feel comfortable in my own skin, to realize that I do have things going for me. This year, I took a lot of project-based classes and got to start my own research on enriching lunar soil to extract iron and oxygen. I hope to continue working in lunar-soil enrichment, which I believe is important to the future of space travel. But, if there's one thing MIT has taught me, it's that I can't plan too far ahead.



"Scholarship support ... has allowed me to focus on pursuing research that I am passionate about, rather than worrying about how to pay for school," says Cesar Meza.



## Julia Schneider '26

Artificial Intelligence +  
Decision Making (Course 6-4)

Growing up as an expat overseas, Julia Schneider '26 first heard about MIT when competing in international robotics competitions. Visiting campus after her admission, she was struck by the immediate potential for research and lab work, even in her first year. "MIT felt like the end of the rainbow," she says. She credits the Harry and Eunice Nohara Scholarship for providing invaluable support: it "enables me to attend my dream school without putting a financial strain on my ability to pursue the many opportunities available here," she says.

### The value of undergraduate research

MIT is brimming with opportunities. In only my first week on campus I met one of my academic heroes, Professor Sangbae Kim, through the Discover Mechanical Engineering First-Year Pre-Orientation Program (FPOP). A semester later, I joined his lab as a UROP researcher. In the 1.5 years since, I've developed reinforcement learning control policies and designed neural network architectures for the MIT Mini Cheetah and Humanoid. My postdoc and PhD mentors' unparalleled mentorship has made UROPing at the Biomimetic Robotics Lab the highlight of my MIT experience.

I feel privileged to be an MIT student because the Institute fosters an academic culture that values undergrads' contributions to its research efforts. I also discovered that students of all ages were enrolled in graduate-level courses alongside me, which speaks to how the only limiting factor at MIT is the number of hours in a day. These early "mens et manus" experiences helped prepare me for internships at Lockheed

Martin and NVIDIA, where I worked on autonomous navigation and large language models, respectively.

#### Academic flexibility

When choosing to attend MIT, I was especially excited that I could major in Artificial Intelligence + Decision Making as an undergraduate, rather than having to wait until graduate school to specialize. Coming here, I learned that I also really enjoy math for math's sake, although I'd previously thought of it as a tool for computer science. At MIT, every time I took a math class, I discovered new models and methods I could apply to solve the challenges I faced in machine learning and robotics. I'm looking forward to declaring a secondary major in math in the fall.

#### New interests and advisory roles

One of my favorite things about MIT is how I learn something new in every conversation with my peers. This inspired me to pursue new interests in student government as a means of immersing myself in our enriching community. As co-president of MIT IEEE/ACM, I lead our executive board to hold an array of seminars, tech talks, and socials that connect students, faculty, and industry partners within the Department of Electrical Engineering and Computer Science (EECS). I also serve on the EECS and MIT Stephen A. Schwarzman College of Computing Undergraduate Advisory Boards, where I advocate for undergraduate experience improvements in regular meetings with department administrators and deans, and

they truly listen to our feedback. I didn't expect to pick up any nonacademic extra-curriculars, but now one of my favorite ways to recharge is through the MIT Latin Dance Club, where we hold weekly bachata and salsa lessons and field a performance team.

#### (7)

#### ANOTHER MIT JOURNEY

Medical student **Lucy Zhao '24** takes the lessons she learned from her multifaceted experience at MIT into the world.

[betterworld.mit.edu/zhao](https://betterworld.mit.edu/zhao)



58%

of undergraduates received a need-based scholarship in the 2022-23 academic year

Julia and her classmates celebrating the end of final exams by using their PE sailing class credits to go for a sail on the Charles.

PHOTO: COURTESY OF JULIA SCHNEIDER



## Raj Mehta '24

Computer Science, Economics, and Data Science (Course 6-14) and Data Analytics (Course 15-2)

Raj Mehta '24 never thought he'd attend MIT. As a kid, he was an avid coin collector and history buff who attended a humanities magnet school in New York City. Over time, he felt drawn to STEM, and stepped out of his comfort zone to apply to the Institute. At MIT, Mehta worked hard to balance studying with fun, joining the Priscilla King Gray Public Service Center as a business analyst and consultant for the Local Enterprise Assistance Fund, which specializes in lending programs and financial assistance for entrepreneurs from under-resourced backgrounds. He also found time to join a fraternity, participate in Model UN, and do research in the Department of Urban Studies and Planning. He names financial aid, particularly the Edward O. Vetter Scholarship, as "the security that ensured I didn't need to work to make it through college and had time for extracurriculars and research."

### A surprising path to MIT

Initially, I thought I wanted to study archaeology in college. I love history and trivia. But throughout high school, I slowly realized that I was more of a quantitative person. I like to problem-solve, to develop frameworks, and to methodically reach solutions. I basically maxed out the STEM curriculum in my school: I took all of the math classes offered and enrolled in STEM-focused programs at nearby colleges.

My mom and I were visiting colleges in Boston the summer before my senior year, and walking through MIT's campus was breathtaking. Obviously, the STEM curriculum is top of the world, and the

diversity of the student body drew my attention. My transition from high school, even from a magnet school, was tough, though. I was really grateful that we weren't graded during that first semester. I could focus more on learning the material and learning studying habits—essentially learning how to learn at MIT.

### "Put your eggs in a bunch of baskets"

My number one word of advice to first-years is to keep an open mind. The first year is the best time to put your eggs in a bunch of baskets and explore all your interests: academically, professionally, and extracurricular-wise. And just meet people—people at MIT are some of the smartest, most accomplished, most successful in the world.

"I didn't come to MIT expecting to join Greek life, but I connected with Theta Chi. They had a solid sense of brotherhood and the work-life balance that I was trying to achieve," says Raj Mehta.

Getting involved in extracurriculars was crucial for me. I was a member of the executive board of our South Asian Association of Students for three years, planning festivals and connecting with South Asian alumni. I also joined Mirchi, our Bollywood fusion dance team, which was an outlet for me both culturally and physically, as well as the Energy Club and Model UN. I also didn't come to MIT expecting to join Greek life, but I connected with Theta Chi. They had a solid sense of brotherhood and the work-life balance that I was trying to achieve.

### Next: the MIT graduate experience

I'm still at MIT and just started my master of engineering. I'm conducting research in the Operations Research and Statistics Group at MIT Sloan and working as a teaching assistant in the Department of Economics.

I'm also studying for the GRE because I hope to go to business school and someday work in data analytics, data science, or even product management. Eventually, I want to be director of analytics for a nonprofit.

Raj (back row, in green) with the MIT Bhangra team at the invitation-only Cornell Pao gathering.

PHOTO: COURTESY OF RAJ MEHTA







Kaleigh in Venice for a MISTI Global Classroom summer session.

PHOTO: COURTESY OF KALEIGH SPEARS



“I became a Resident Peer Mentor to make sure that others living in my dorm knew where to go if they needed help, because it can be tough,” says Kaleigh Spears.

about how world travel works and how to be in a new culture for the first time. During Independent Activities Period (IAP) in 2024, I went to London with a literature class, 21L.591 Literary London, where we read authors including Shakespeare and Virginia Woolf. It was a wonderful experience to focus on literature apart from everything else at MIT—the backdrop and Professor Diana Henderson’s enthusiasm made everything exciting. I just can’t say enough good things about the trip.

## Kaleigh Spears '25

**Urban Science and Planning with Computer Science (Course 11-6)**

As a high school student, Kaleigh Spears looked at colleges through the chlorine-tinted lens of competitive swimming. “After having great conversations with the coaches and swimmers here, I could really see myself at MIT,” she says, “but I also chose to come here because it was affordable for me and my family.” The Arthur J. Samberg Scholarship was a critical part of that support, she says. After graduation, Spears will spend an extra year on campus to complete a master’s in city planning.

### The universality of urban planning

I didn’t know what urban planning was coming into school, but learned about it in a first-year advising seminar about environmental justice with Justin Steil, an associate professor of law and urban planning. We discussed issues like climate justice and energy in small groups. While I was enjoying my

math classes, I liked going to that seminar every day where everything wasn’t so black and white, and where we were thinking about how other people are impacted by our actions.

I ultimately chose urban planning as my major because of the human aspect—everyone has experienced urban planning issues. I’ve really enjoyed bringing what I’m studying in the classroom to the table to include other people in the conversation.

### Lessons from abroad

After my sophomore year, I did a two-week MISTI (MIT Global Initiatives) trip to Venice, Italy, where we learned about biodiversity in their salt marshes and made a hypothetical city plan. It was neat to think about urban planning in a totally different context. That was my first trip abroad, so I also learned

### Resources and relationships

My first year at MIT was a roller coaster. I sought out a lot of resources and tutoring, so as a sophomore, I become a Resident Peer Mentor, an informal resource for new students and other residents. I wanted to make sure that incoming students and the others living in my dorm knew where to go if they needed help.

Swimming has also been a huge part of my journey and helped with the transition to MIT life. During IAP, especially, we would have intensive practices and team dinners where we’d really get to bond. We traveled during the season, but since MIT has one of the best facilities in the Northeast for Division III swimming, a lot of teams would come here to compete. I was on the team for two years, and now I get to go to their meets and cheer for some of my closest friends.

give

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# Real People, Real Solutions

**MIT D-Lab students innovate to help solve challenges in communities worldwide**

This past January, in the small, small town of Ambovombe in southern Madagascar—a place accessible by the bumpiest of roads—Lilly Heilshorn '25 learned something she'll never forget: what gets engineered in the controlled comforts of a lab may not work once it's dropped into the real world for a test drive.

You might say it's a central lesson of MIT D-Lab, which works with people around the world to develop and advance collaborative approaches and practical solutions to global poverty challenges. Founded in 2002, D-Lab is now part of the MIT Morningside Academy for Design, an Institute hub for cross-disciplinary education, research, and innovation formed in 2022.

In Madagascar, the majority of the population struggles with accessing clean water. Tatirano, a local organization that empowers Malagasy women and works on water access, has responded in part by developing the beginnings of a solar-driven desalination system. They reached out to D-Lab for assistance in designing and building a condensing chamber for the desalinator to collect the clean water.

That's how Heilshorn and six classmates from MIT and Wellesley found themselves last fall in a course called D-Lab: Development, creating two prototypes of the chamber, an iterative process that involved weekly meetings with Tatirano and others. "I love the way the class was set up," says Heilshorn, "in that we were presented with this challenge to solve." She found that the best way to work through that challenge was to communicate with her teammates both in Cambridge and half a world away. "This class really emphasizes creating technology that matters to real people," she says. Otherwise, "it will not last as a long-term solution."

The condensing chamber prototypes weren't something that Heilshorn and her fellow students could simply bring aboard the plane, which meant they needed to transmit their design specs to a group of Malagasy students ahead of time to build onsite. During Independent Activities Period, the student team traveled from Boston to Ambovombe to see Tatirano's model for collecting rainwater and empowering local women firsthand. It's also when Heilshorn and her classmates realized their prototypes weren't working.

**"What can I do to ensure that the work that we're doing will be meaningful when we go to the place it's intended for?" says Lilly Heilshorn.**

Above and opposite page, top: D-Lab students tested a desalination system in Madagascar.

PHOTOS: COURTESY OF D-LAB

Heilshorn says connecting with real people and real problems taught her the value of weaving a central question into her engineering projects going forward: “What can I do to ensure that the work that we’re doing will be meaningful when we go to the place it’s intended for?” She also came to recognize the importance of talking with local partners when collaborating. “It just feels a lot more tangible,” she says. “Engineering exists with a context. Within a place.”

But beyond observing whether the prototypes worked or not, Heilshorn stresses the importance of “getting to experience a new culture and use that to inform future projects.” She loved connecting with Malagasy students her own age who taught her that water access is fundamental to every aspect of life.

### “It gets you out of your seat”

The D-Lab curriculum, which consists of a dozen or so class offerings per year, isn’t meant only for those who want to pursue a career in international development. Rather, “students are coming from every major, and we really are providing them with tools to think about interdisciplinary complex problems,” says Libby Hsu MNG ’10, SM ’11, D-Lab’s associate director of academics.

One such problem that students wrestle with in the introductory course is: What does poverty look like around the world today, what historical forces shaped our modern economic and social reality to distribute wealth unequally, and what might we do about it? Sometimes, the students are tasked with developing responses to particular fallouts of climate change. “We really want students to be exposed to these global ideas,” Hsu says, “and the diverse ways that people are thinking about those problems around the world.”

No matter what trajectory a student takes after graduating from MIT, Hsu says the intention is that “they’ll use those problem-solving skills they acquired at D-Lab in their personal and professional lives in the future.”

Most of the classes contain an overseas travel component. Because these projects can’t be completed



within a single semester, international partners often work with successive cohorts of students over many years.

Heilshorn found the D-Lab curriculum refreshing. “It gets you out of your seat,” she says. “It gets you out of your iPad and your notebook. You meet with your teammates one day. Then you prototype things. Then you test them and share your results.”

### Human-centered design

Graduate students can sign up for D-Lab classes too. Neil Patel MAP ’23, for example, took a year out of his career implementing projects for the United States Agency for International Development to pursue a master’s in the Data, Economics, and Design of Policy program at MIT. His background is in economics and data science, so he was excited to try a hands-on experience with D-Lab that allowed him to work with environmental, mechanical, and civil engineers. Patel and his team helped a group in Colombia to develop a wastewater treatment system that mimicked an artificial wetland, using a layer of worms to compost the fecal sludge before filtering it through multiple layers of gravel and sand.

Patel has noticed that those in the humanitarian field sometimes develop solutions before properly understanding the problems and needs of a community. D-Lab taught him the importance of co-creation and human-centered design. “An idea is only as valuable as the people who ultimately use it,” he says. “We were working with our Colombian counterparts collaboratively to see how our collective strengths could come up with the best possible solution.”

As for Lilly Heilshorn, she credits D-Lab with helping her find her niche and a sense of direction. “I found the intersection of my academic, community service, and travel interests,” she says proudly, “and I’ve found something that I can see myself doing in the future.”

—Ari Daniel



SUPPORT MIT D-LAB AT  
[giving.mit.edu/d-lab](https://giving.mit.edu/d-lab)

In Colombia, Neil Patel MAP ’23 (left) and his team worked on a wastewater treatment system.

PHOTO: COURTESY OF NEIL PATEL

# A Place for Well-Being

MIT prioritizes support for student health and community

Rome Delgado-Gonzalez '26 was unmoored when he arrived at MIT. As a first-generation American from Miami, he missed his family. He worried about the workload. He even felt overwhelmed on the basketball team, a sport that typically helped him to blow off steam. As fall faded to winter, he started drinking heavily to cope.

"MIT was a long way from home. The culture and the lifestyle are very different. The intensity of the environment wasn't easy. I missed my family. I felt very depressed. I worried that I wasn't performing well. I was always anxious," he recalls.

One night, Delgado-Gonzalez became overly intoxicated and ended up in the hospital. Things had to change.

"I wasn't talking about [my feelings] with anybody. I'd never been to a therapist before," he says.

Assistant Dean of Student Wellbeing Robyn Priest met with him to come up with a plan for healthier living. In a meeting, she suggested that he apply to be an assistant at MIT's new Wellbeing Lab. The role recentered him. Today, Delgado-Gonzalez greets fellow students who visit the lab. He introduces them to the space and to programming like workshops on sleep, nutrition, and self-care.

The Wellbeing Lab is the physical manifestation of DoingWell, an Institute initiative focused on four pillars: mind, body, relationships, and purpose. The lab debuted in October 2023 on the third floor of the newly renovated Stratton Student Center. Sunny and bright, it offers a quiet place to recharge mind and body with coloring books, knitting, and (since this is MIT) LEGO. It hosts community workshops and movie nights to foster strong relationships. Finally, it houses private areas for meetings with offices like Student Mental Health and Counseling and GradSupport for students to crystallize a sense of identity and purpose.

## Services, proactive education, faculty involvement

The Wellbeing Lab, says Suzy Nelson, vice chancellor and dean for student life, "is the culmination of more than a decade of work to integrate and centralize well-being on campus."

In 2020, the Division of Student Life launched the Office of Student Wellbeing to support the effort. Part one involved ensuring the MIT community knew where to turn for help when needed, which was particularly critical

The new Wellbeing Lab provides fitness classes as well as a comfortable place to rest and recharge.

PHOTOS: COURTESY OF WELLBEING LAB



during the Covid-19 pandemic. Part two was proactive education: reaching out to students, beginning at orientation, about how to prioritize self-care in a stressful environment. Third, the office worked with faculty on how to interact with students in crisis and how to foster learning communities that promote camaraderie and connection.

“We wanted faculty not just to refer students when they were concerned about their health, but also think about how to infuse principles of well-being into classes while still maintaining the academic rigor that MIT is famous for,” says David Randall, the senior associate dean for student life.

Data culled from MIT’s Institutional Research team and from Student Quality of Life surveys cemented the urgency. They found reliable predictors of undergraduate and graduate student well-being: confidence in their ability to navigate MIT socially, having friends and a sense that they belonged, and feeling prepared for life after graduation.

The Wellbeing Lab, made possible through the financial support of MIT alumni and friends, is a place where students can see those efforts in action. World-class research labs and makerspaces have long signified MIT’s commitment to knowledge building and hands-on



The Wellbeing Lab “is the culmination of more than a decade of work to integrate and centralize well-being on campus,” says Suzy Nelson.

learning. Providing a lab dedicated to well-being signals the same prioritization of student health and connection. Here, it’s OK to curl up on a comfy couch for a nap, quietly sip tea, or just read a book.

### The importance of boundaries

Of course, relaxation can be a tough sell for highly motivated students.

As a first-year student, “there was always something to do that was more pressing than rest or recovery,” says Annabelle Liefke ’26, a computer science major who works at and uses the Wellbeing Lab. As a sophomore lab assistant, she began to set boundaries.

“I don’t do homework while I’m eating. I refuse, whether it’s a snack or a meal. That’s a sacred time. When I’m on my well-being shift, I make a cup of tea and check in with people at home. If I find the motivation to get some work done, maybe I’ll open my laptop, because sometimes working on something is rewarding. I try to maximize those times,” she says.

Yes, students do study at the lab, but it’s a choice, not a focus. Student lab assistants help normalize resting and recharging, students say. Having a dedicated space to connect helps to legitimize that goal.

“MIT is a really busy school. There’s honestly no getting around that. But by establishing a space that allows students to take a step back and have two- or three-minute conversations with friends in an amiable environment, it’s an invaluable addition to MIT’s campus,” says lab assistant Surya Sakhamuri ’26, a materials science and engineering major. “It not only serves as a reminder but also as an opportunity to take some time for yourself. Everyone can afford to do it. It’s just about how much of a priority it is for students.”

For Delgado-Gonzalez, it took a medical crisis to prioritize mental health. Today, he’s glad he did. He’s thriving as a business analytics and data science major. He competes on MIT’s Men’s Basketball Team and is part of the Sigma Chi fraternity and the MIT Sloan Investment Management Club. As a Wellbeing Lab assistant, Delgado-Gonzalez wants his peers to know that they aren’t alone, or any less worthy, if they feel overwhelmed.

“This is obviously one of the most challenging institutions not only in the United States but in the world. There are a lot of expectations on you, and the curriculum is very tough. It’s like an identity crisis: you’ve been a top student your whole life, and then you come to the school and it humbles you. It’s a very hard thing to overcome at times,” he says.

Of course, what makes MIT stressful also makes it special. The Division of Student Life hopes that students see the Wellbeing Lab and the overall DoingWell initiative as tools to sharpen focus in other areas of campus life.

“We know that students come to MIT because of the high academic rigor. The academic experience is what MIT is known for. What we’re trying to do is to have students prioritize their well-being so that they can be the best students, researchers, and learners possible,” Randall says.

—Kara Baskin

# Presidential Fellowship Moves Innovation and Research Forward

Prestigious MIT program celebrates 25th anniversary

In fields as varied as computer architecture, behavioral economics, data activism, and planetary science, MIT Presidential Fellowship recipients and alumni credit the prestigious award with improving their research, expanding their opportunities, and broadening their academic network. The donor-supported program, administered by the Office of Graduate Education in coordination with the Office of the Provost, provides fellows with tuition, a monthly stipend, and medical insurance for their first academic year at MIT.

Raechel Walker SM '23, a PhD candidate in the MIT Media Lab's Media Arts and Sciences program working in the Personal Robots Group, says the Presidential Fellowship has helped her build on a passion for increasing diversity in computing through her Data Activism Program for African American high school and college students. During her master's thesis, Walker introduced the concept of "liberatory computing," which ensures African American students use their computing skills for societal transformation.

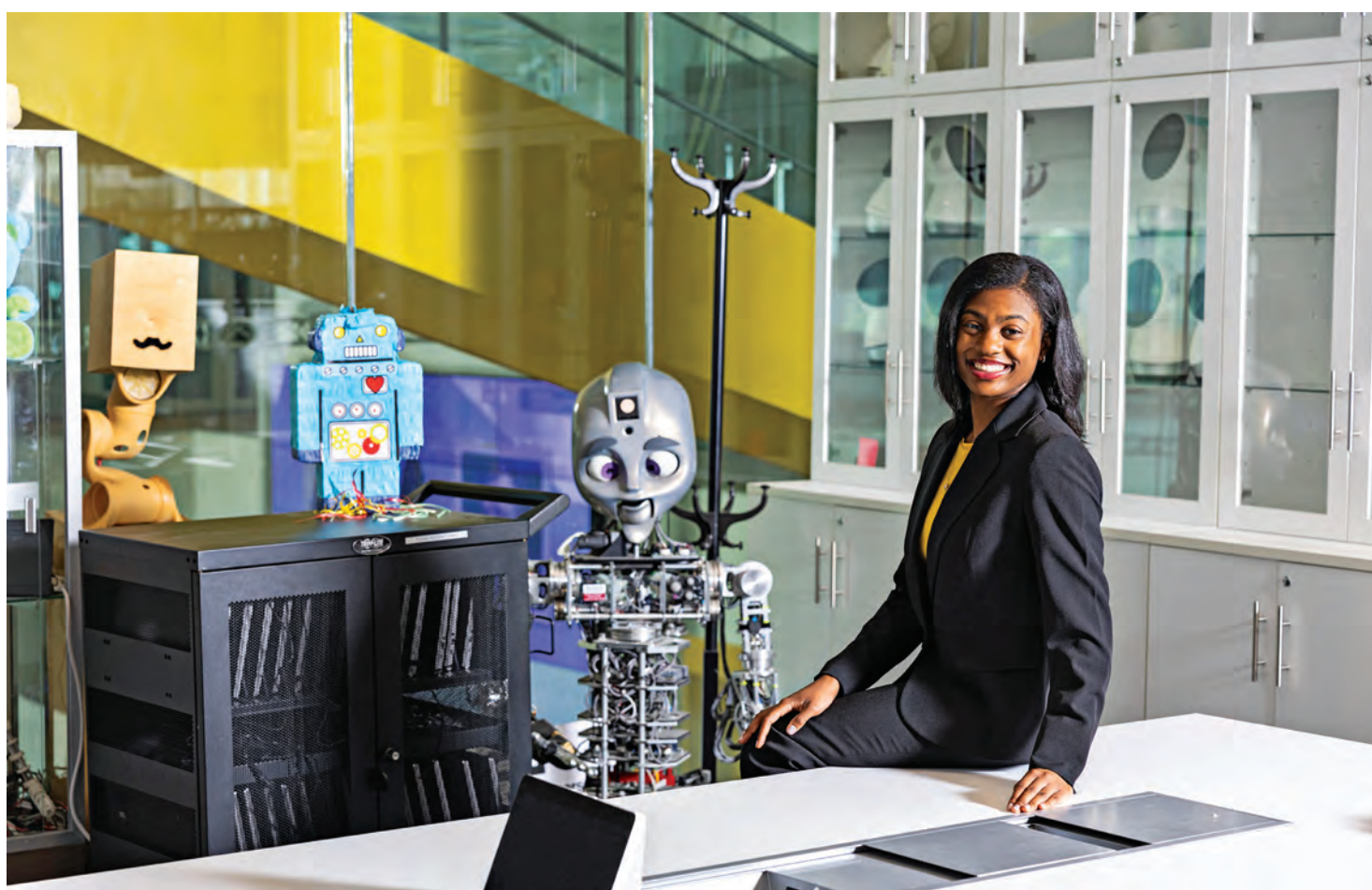
Today, she's publishing the program's results and sharing her data activism curriculum with a larger audience. She ran two programs last summer virtually and in person at the Media Lab with 34 students. While collaborating with four community organizations, students used computer programming and data analysis to create insightful data visualizations highlighting systemic issues such as AI bias in education, environmental injustice, health care disparities, and mass incarceration.

"What excites me the most about my research is seeing students view themselves as data activism researchers after completing my program," Walker says. "I also love when students feel more empowered to become data scientists because they share a similar cultural background with their classmates and mentors, which is not usually the case in a typical computing environment."

The Presidential Fellowship meant she received enough funding to pursue independent projects based on students' needs. "This fellowship is important to me because it allows me to focus on ensuring that my research makes a

Raechel Walker SM '23 conducts research in the Personal Robots Group at the MIT Media Lab.

PHOTO: JAKE BELCHER





positive impact on the world,” Walker says. “Additionally, the recognition from this fellowship gives me the confidence to expand my data activism program, knowing that other researchers and academic professionals find my research valuable.”

#### “The freedom to explore”

Walker is not alone. MIT established the annual Presidential Fellowship awards to recruit the most outstanding students worldwide to pursue graduate studies at the Institute and admitted the first class of fellows in September 1999.

Recent fellows include Courtney Golden, a PhD student in the Department of Electrical Engineering and Computer Science and researcher in the Computer Science and Artificial Intelligence Laboratory, who came to MIT with a broad set of interests and an open mind in terms of research. Now, with the goal of designing next-generation electronic systems, she concentrates on designing innovative computer hardware and orchestrating how mathematical computations run on that hardware to dramatically increase its performance and efficiency. This could save scientists time and energy on applications such as big weather simulations, circuit design, and even credit card fraud detection.

“Where you store your data on a chip relative to where you physically do the computation involving data has a huge impact on performance,” she says. “If those computations can run faster, then scientists can iterate faster on their designs. They can solve problems and

answer questions. Another exciting part is that we can provide the capability to do more complicated algorithms that we currently don’t have the resources to do.”

The Presidential Fellowship, she says, “really let me explore and kind of try out a few things during my first semester, before settling on a project.” She looked into how to accelerate MRI image reconstruction, for instance, before deciding on her current focus.

“It was a lot of reading papers, talking to people within MIT, and figuring out what different research areas would look like,” Golden says. “The ability to scale things up and be able to support computations for the modern world was very interesting, so I saw possibility in that direction.”

#### Economics to design social change

Pedro Carregã Sant’Anna, a PhD student in the Department of Economics, says it is unlikely he could afford to be at MIT without the Presidential Fellowship, much less in Indonesia assisting in conducting large-scale field experiments for the first time. Working last summer with Benjamin Olken, the Jane Berkowitz Carlton and Dennis William Carlton Professor of Microeconomics, and with the Abdul Latif Jameel Poverty Action Lab, Carregã Sant’Anna interviewed a wide range of Indonesians to understand

how two government programs related to poverty and unemployment could best be designed by his team and then tested and implemented.

Carregã Sant’Anna’s projects use economic tools and data to analyze and design policies related to inequality, discrimination, and social identity. His primary interests—motivated, he says, by his experiences growing up as a Black man in São Paulo, Brazil—focus on development, political economy, and behavioral economics. “Hopefully, this can improve our understanding of these issues, providing insights on how to design policies that make people’s lives better,” he says.

The fellowship was a “huge honor,” Carregã Sant’Anna says, and a sign that the university believes in his potential.

“I am confident that MIT is the ideal place for me to pursue the research that interests me,” he says. “In the economics department and at MIT in general, I have found an incredible community with supportive faculty who engage deeply with students’ ideas and inspiring colleagues who are very collaborative and have already become my great friends. At MIT, I am becoming a much better researcher, which would be impossible without the Presidential Fellowship.”

PhD student Courtney Golden’s research focuses on next-generation electronic systems.

PHOTO: SARAH BASTILLE



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PhD student Jensen Lawrence's geology field research took him to Muddy Mountains, Nevada.

PHOTO: COURTESY OF JENSEN LAWRENCE

### Going the distance

The fellowship also took Jensen Lawrence, a planetary science PhD student in MIT's Department of Earth, Atmospheric and Planetary Sciences, far away from Cambridge—from a geological mapping camp in Nevada to an observing run collecting data at a major research telescope in Chile. It's no wonder: Lawrence's research

focuses on how planets and planetary systems form and evolve, primarily by studying protoplanetary disks (the disks of dust and gas that encircle newborn stars) and exoplanets (planets that orbit a star that is not the sun).

"The physics and chemistry of protoplanetary disks determine the characteristics of the planets they form," says Lawrence, who works in the Planet Formation Lab under the supervision of Richard Teague, the Kerr-McGee Career Development Professor, and studies solar system surfaces in the lab of Assistant Professor Gaia Stucky de Quay. "Similarly, the physical, chemical, and orbital properties of existing planets provide hints about how they formed and how they've evolved since formation. I hope to leverage telescope observations and computational models to elucidate connections between protoplanetary disks, exoplanets, and the solar system."

Thoroughly enjoying this period of his academic career, Lawrence says the Presidential Fellowship program helped set him up for success. He has been able to pursue the research that interests him and take the classes he wants without restriction or financial worries, particularly important to him as an international student from Canada.

"I'm very grateful for the freedom that this fellowship has enabled," Lawrence says. "There are so many revolutionary discoveries just around the corner that will yield deep insights into planetary origins and evolution, and I can't wait to be a part of them." —Pamela Ferdinand

## Fellowships and Spaces for the Whole Student

**JULIE A. LUCAS**, the Institute's vice president for resource development, talks about MIT's role in supporting the whole student through Presidential Fellowships and campus spaces.

### The Presidential Fellowship program is celebrating its 25th anniversary in 2024. What makes this program special?

Each year, the Presidential Fellowship program provides full financial support to many of our most promising graduate students. With the resources of the program behind them, Presidential Fellows have the flexibility to explore and pursue the research interest of their choice during their first year at the Institute. You can meet some extraordinary fellows starting on page 20 and learn about their deep expertise and passion for their work.

The fellowships are also a powerful tool for recruiting and retaining graduate students who

will work with our world-class faculty and help accelerate MIT's research enterprise.

One of the primary reasons the Presidential Fellows program has been so successful in supporting students over the years is the contributions of alumni and friends. As the Institute celebrates a quarter century of this flagship program, raising additional funds continues to be a significant priority.

### How else can MIT's alumni and friends support the whole student?

Scholarships, fellowships, experiential learning opportunities, athletics, physical spaces, and unrestricted funds are all crucial components of MIT's commitment to educating the whole student—which you can read more about in the discussion with Chancellor Melissa Nobles on page 8—and there are numerous opportunities for the MIT community to contribute.

One of MIT's top priorities is developing and maintaining spaces that celebrate community, wellness, and residential life. The Wellbeing Lab (page 18) and Undergraduate Advising Center (page 23) are great examples of this, as is the iconic East Campus residence. The distinctive residence, which opened in 1924 and remains a bastion of self-expression for undergraduates, is being renovated for future generations with input from students, faculty, alumni, and administrators. Reopening is planned for 2025.



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# A Home for Advising

## Four things to know about the MIT Undergraduate Advising Center's new campus hub

The MIT Undergraduate Advising Center (UAC), established in 2023, helps undergraduates reach their full potential by offering individualized advising from their first year to graduation. A new advising hub, located along the Infinite Corridor and slated to open in fall 2025, will support the activities of the UAC and other related programs and initiatives.

### 1) The new space was designed with the whole student in mind.

Supporting academic success is a cornerstone of Chancellor Melissa Nobles's focus on supporting the whole student. To that end, the UAC strives to positively influence the academic lives of every undergraduate and recognizes that every student will have a unique experience at MIT. "Our vision is that every undergraduate student at MIT, no matter their background, receives world-class advising support," says UAC Director Diep Luu. "We are actively developing new student success programs and initiatives to help reduce the disparities in on-time graduation, particularly among underserved student populations such as first-generation college students, low-income students, and transfer students." Luu likens the UAC to "connective tissue that coordinates advising, tutoring, and other supports across campus to ensure that students know about these resources and use them when they need them."

### 2) The design of the advising hub is the direct result of student feedback.

The hub answers a longstanding call from students for a centralized campus location to support undergraduates' academic needs, says Kate Trimble, senior associate dean and director for the Office of Experiential Learning. "We engaged students at every step of the hub's design, getting their input on what makes a space comfortable, welcoming, functional, and fun," says Trimble. Particular attention was paid to details like natural lighting, comfortable seating, and the creation of multifunctional areas that can be used for both private conversations and larger-scale gatherings. "We want students to feel excited



ARTISTIC RENDERING: MERGE ARCHITECTS

and energized by the space because it reminds them of why the MIT community is so special," says Trimble.

### 3) Dedicated UAC advisors will use the space to advise undergraduates throughout their entire undergraduate MIT experience.

UAC advisors, professional staff with advising expertise, provide students with a guiding hand throughout their undergraduate years. "The intention is to make it easier for students to navigate the MIT landscape and encourage them to connect with academic support resources sooner rather than later, whether it's for MIT's General Institute Requirements or more advanced-level classes," says Luu, who has been instrumental in the design of the center's advising model. The UAC advisors will complement—not replace—students' departmental faculty advisors and will stick with students for all four years, providing helpful and holistic advice and warm referrals on a wide range of topics (majors, minors, concentrations, experiential learning, financial aid, career pathways, and more).

### 4) The hub will be multifunctional and open to all.

The new UAC is anticipated to open in the fall semester of 2025. Trimble envisions the UAC's dynamic design and multifunctionality, brought to life by Merge Architects, as a magnet that will draw in all students. "It will be a place to touch down between classes or work collaboratively with friends, inviting them to pop in and say hello to their advisor or grab a snack," she says. "We want it to function well for students and staff, for a wide variety of uses—everything from getting a quick answer to a question to having a sensitive advising conversation to big open house-style events." —Julianne Massa

*Julianne Massa is a 2024 Council of Advancement and Support of Education (CASE) Summer Intern.*



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# Driven by Doing

The MIT Edgerton Center helps students build confidence and camaraderie through hands-on challenges

The motor whirrs as MIT undergraduates gather around their electric car, running some final tests in preparation for racing it at a competition in a few days. One student sits in the driver's seat, squeezed between steel tubes and a steering wheel that looks like a glorified Xbox controller, another hunches over a laptop, and another tinkers at a wall full of toolboxes. "We started designing this last July," says Megan Gupta-She '25, president of the MIT Motorsports Team. Students designed and welded the frame, cut carbon fiber panels, built batteries from scratch, and test-drove the finished vehicle, all during a single school year. "You'd never see a car company build something this quickly," she observes. "It's kind of crazy they let us do this."

The team builds their vehicle inside a massive garage in MIT's Building N51 on Massachusetts Avenue. It's one of several student clubs that use the space, a controlled chaos of heavy machinery, workbenches, and computer stations, thick with the smell of auto grease. The garage is one of the campus facilities providing students with space for hands-on engineering under the auspices of the MIT Edgerton Center, an organization created to honor the legacy of pioneering MIT professor Harold "Doc" Edgerton. "We are strong believers in experiential

learning—as was Doc," says Professor J. Kim Vandiver SM '69, PhD '75, who founded and still directs the Edgerton Center. "When students try something on their own and fail and fail again but then succeed, it's a huge confidence builder for them."

## Learning without noticing

As a graduate student at MIT, Vandiver was Edgerton's teaching assistant before joining the faculty as a professor of ocean engineering in 1975. He maintained a close relationship with Edgerton until he died in 1990, with a front-row seat to Doc's creative approach to education and warm rapport with students and colleagues. Known for his pioneering freeze-frame photos of subjects ranging from a milk droplet to a bullet bursting through an apple, Edgerton continued to innovate throughout his life with new technology for underwater photography and sonar. His philosophy of teaching was hands-on, encapsulated by his famous quote about students: "The trick to education is to not let them know they are learning something until it is too late."

Starting in 1992, Vandiver turned a lab in Building 4, known as Strobe Alley, into an Edgerton-inspired center of learning-by-doing, funded for the first 10 years by Doc's

The 2024 MIT Motorsports Team with their electric race car at an Edgerton Center Showcase in April.

PHOTOS: SARAH BASTILLE

wife, Esther, and then through an endowment established by the Edgerton family. Additional support from donors, many of whom knew Doc personally, has allowed the Edgerton Center to expand its support of student-inspired projects and K-12 programs.

Vandiver leads the way down a hallway lined with Edgerton's iconic photographs to a makerspace used for K-12 education, home to a monthlong summer design workshop for high school students. "That's the wall of failures," he says, pointing to a wall of half-finished skateboards and electric guitars, all object lessons on the road to eventual success.

#### "It's your space"

While the center teaches classes in the strobe photography that made Edgerton famous, the majority of the spaces it runs are free for students to use for any project, not just those specific to coursework, providing a valuable outlet from the pressure cooker of tests and lab assignments. "When you are doing something you are excited about, it gets your mind off the stuff that's dragging you down," says Vandiver. "When you combine that with the feeling of success when something you've been working on finally works out, there is nothing like it to improve your mental well-being."

Nearby in the basement of Building 6C is a new electronics lab, a full-blown machine shop, and the so-called Metropolis makerspace, complete with laser cutters, sewing machines, and woodworking tools, which students can access after being trained by fellow student-mentors.

The garage at N51 opened more than a decade ago and is now home to the MIT Solar Car Team, Combat Robotics Club, and the Motorsports Team. In keeping with the Edgerton Center's philosophy, however, the space is open to any student to use. "I give a lot of responsibility to students," says MIT technical instructor Patrick McAtamney, who previously worked as a research machinist on NASA's Hubble Space Telescope and space shuttle radar systems. "I always tell them, 'it's your space, I just watch over it to make sure nobody gets hurt.'"

#### Forming lifelong bonds while excelling

MIT Motorsports has had its share of victories in annual race car competitions over the years, but its team members are just as well-known for their sportsmanship and collaborative spirit. "I've seen students leave their own paddock to help another team with a battery or mechanical issue," says McAtamney. "MIT just breeds these students that want to help other people."

After the Covid-19 pandemic paused the club's in-person operations for more than a year, the Motorsports Team had to recreate itself from scratch and is thriving despite having to restart with students who were new to designing and building cars. In the spring of 2024, MIT's team put in an exceptional showing at the Formula Hybrid Competition, founded and run annually by the Thayer School of Engineering at Dartmouth College, winning second in acceleration and first in design.

**"Working towards something bigger than ourselves is a big part of our motivation," says Megan Gupta-She.**

It's no surprise that top vehicle companies, including Tesla, SpaceX, Ford, and GM, are eager to recruit Motorsports and Solar Car grads, according to Vandiver. "These are some of the very best engineers at MIT," he says. "They've had these real-life experiences and learned how to manage a project from beginning to end."

For students, the experience is as much about camaraderie as career opportunities. Team captain Gupta-She recalls one first-year student from a small-town high school who was completely overwhelmed by the rigor of MIT when he arrived. "He said one of the things that got him through first semester was Motorsports, and working with a supportive group of people towards something tangible that you could see."

Gupta-She lives with two friends she met through the club, and recently visited club alumni who still live together in Silicon Valley. "You can't do a project like this without being really good friends and supporting each other," says Gupta-She. "Working towards something bigger than ourselves is a big part of our motivation."

—Michael Blanding



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# Competing for the Joy of It

**MIT club athletes play for fun and friendship, with winning results**

An engineering mindset lends itself to wrestling. Just ask the Pannell sisters, Viveca '25 and Veloria '26, both engineering majors and, as stars of the MIT Wrestling Club, perhaps the Institute's most accomplished tag team.

"At MIT, people joining in the practices really enjoy the technique stuff," says Viveca, an electrical engineering and computer science major who is also a two-time National Collegiate Wrestling Association (NCWA) champion and three-time All-American in the 130-pound weight class.

"There's so much coaching about how your lever arm's longer if you grab the guy by his wrist instead of his armpit, or if you shift your weight, you get your opponent over the pivot point," she says. "A lot of our team members really like the mechanics of it."

Adds Veloria, an electrical engineering major, two-time NCWA champion in the 143-pound class and 2023 winner of the association's Most Outstanding Wrestler Award: "In engineering, you're used to failing over and over again until you can perfect it and get it right. You learn to improve, and that's really helpful."

The hours of practice may be grueling, they say, but the reward comes in the hand raised in victory and the knowledge that you have done your best. "The best feeling is when you're losing in points throughout the match and you fight your way back and finally triumph in the last minute," says Veloria. "That feels great, because you've earned it."

## "You will become talented and skilled"

The Pannells are enthusiastic participants in the vast universe of MIT club sports, with thousands of individuals competing for fun and the love of the game.

A complement to 33 intercollegiate varsity sports at MIT, the Institute's 34 club sports range from archery, badminton, and cricket to triathlon and ultimate frisbee. Club sports are open to all students, faculty, staff, alumni, and spouses with a Department of Athletics, Physical Education and Recreation membership. (That's in addition to the more than 20 intramural sports offerings, with in-house league competitions in basketball, soccer, flag football, and esports, among other recreational activities.)

Sport taekwondo, golf, and gymnastics are the three most popular club sports at MIT, says Nicholas Jewell, associate director of club sports, intramural sports, and sports camps. "We have some clubs that are trying to win national championships, and some that don't compete at all and are purely instructional," he says.

"As I tell parents at orientation, MIT will prepare their child for a successful career when they graduate," he says. "But it can be a struggle for a student coming to a new city, not knowing anybody, not having

any friends, or having trouble socializing. Mental-health barriers can be overcome by picking up a hobby or a sport, even casually.

"My whole pitch about club sports is if you do this even for just two of your four years at MIT," says Jewell, "you will become talented and skilled enough at a sport so that no matter where you move in the world or what you end up doing, you will be able to integrate yourself into a community of friends."

According to Jewell, some 3,300 of the more than 4,000 members of the MIT community who participate in club or intramural sports annually are undergraduate or graduate students. He estimates close to a third of the total student body takes part in club or intramural sports before graduating.

Sometimes the club athletes even give their varsity counterparts a run for their money. Jewell recalls the remarkable performance of the MIT Rowing Club's men's eight at the Head of the Charles Regatta (HOCR), the world's largest two-day rowing event, in 2022 when the club rowers finished only three seconds behind the MIT men's varsity heavyweight "C" eight over the three-mile course.

"They were this close—probably only a boat's length away," he says. "I think it fills them with a little bit of glee. There's a lot of camaraderie in that spirit of competition."

## "A community I appreciate"

Maarten Peters, a doctoral student in materials science and engineering, rowed in the boat that set a club record at the 2022 HOCR with a time of 16 minutes, 11 seconds. "It just clicked that day," he says.

Rowing in the two seat, Faraz Faruqi SM '22, a PhD student in computer science, was competing for the first time in the HOCR. Faruqi had never set foot in a shell before signing up for a learn-to-row class with the club the year before, he says. Now he is a regular at practices on the Charles at six in the morning.

"Rowing is a good motivation to wake up, but it has very quickly become a community I appreciate," he says. "I know that once I'm at the boathouse, I will not miss my bed."

Among other noteworthy accomplishments by MIT club athletes, Karyn Real '23, MNG '24, a member of the MIT Sport Taekwondo Club, competes for Team USA in the sport. She has medaled at the Pan American Games and US Open, among other competitions, and was ranked second in the world in 2022. Specializing in poomsae, a noncontact technical sequence of blocks, strikes, and kicks in the Korean martial arts, Real will compete at the 2024 World Taekwondo Poomsae Championships in the fall.

Meantime, NASA astronaut Warren "Woody" Hoburg '08 so fondly recalled his experience with the MIT Alpine Ski Club that he asked for a club patch to take to space with him aboard the

### (7)

#### LEADERSHIP AND FRIENDSHIP

Named the National Collegiate Athletic Association's Woman of the Year in 2022, soccer player **Karenna Groff '22, MNG '23**, credits her MIT athletic experience with building leadership skills and bonds of friendship to last a lifetime.

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

MIT wrestlers Viveca (left) and Veloria Pannell.

PHOTO: KEN RICHARDSON



International Space Station. “He’s got a picture of himself floating in space with it,” Jewell says. “It’s just really cool, the impact club sport communities have on students, even after they leave.”

#### “MIT gymnastics will be in my life for a long time”

PhD biology student Molly Carney, copresident of the MIT Gymnastics Club, started in gymnastics as a five-year-old in Arlington, Massachusetts, and competed through high school and then with the gymnastics club at the University of California, Los Angeles.

Carney has kept up with the sport at MIT, focusing on balance beam and floor exercises. In April, she traveled with some 20 teammates to Albuquerque, New Mexico, to compete in the nationals hosted by the National Association of Intercollegiate Gymnastics Clubs.

“The friendships and relationships I’ve made are going to last beyond my time at MIT,” Carney says. “Alumni are allowed to be part of the team, and there are people who went here for undergrad who are still active in the club in their thirties. I feel like I could be here forever, if I wanted to. So I think MIT gymnastics will be in my life for a long time.”

#### “It has taught me mental resilience”

“I like going to practice as a stress relief,” says wrestler Veloria Pannell. “It’s a way to connect with people and take your mind off school. When you’ve been stuck in a study session for hours on end, it’s a good break.”

The Pannells said their two younger brothers had been wrestling for a couple of years when, with the introduction of a girls’ wrestling team at their high school in Los Gatos, California, the sisters decided to take up the sport. “We stuck with it because we enjoyed it so much,” says Veloria. Both sisters have excelled.

“The thing I enjoy about wrestling is it’s fun,” says Viveca. “It has taught me mental resilience, that it’s OK to fail and keep going. Plus, wrestling people are just really fun to hang out with. I like to tell people, wrestling keeps me grounded.” —Mark Sullivan



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# Great Expectations

For MIT varsity athletes, excellence in sports, studies go hand in hand

The 50-yard freestyle is nicknamed the “splash and dash.” For Tobe Obochi '24, a national champion in the swimming event, all the miles swum in practice come down to a 20-second sprint.

“It’s sheer will,” Obochi says, “just willing your arms and your legs to get you to the wall faster than everyone else.”



“When you hit the wall, you have no clue who won, until you look at the board,” he says. “In the 100, you know if you’re ahead or behind. But in the 50, you can’t really see anyone. You just spin, touch the wall, turn around. And then you win or lose, by margins of 100ths of a second.”

With his victory in the 50-yard freestyle at the National Collegiate Athletic Association (NCAA) Division III Championships in Greensboro, North

Tobe Obochi '24 is a national champion across multiple distances.

PHOTO: ANDY MEAD

Carolina, in March, the recent graduate in computer science and engineering from Highland Park, Illinois, won the second individual national title of his college career and his fourth title overall.

A 19-time All-American who previously won Division III national championships in the 100-yard freestyle, 400-yard freestyle relay, and 200-yard freestyle relay in 2022, Obochi contributed to a notable harvest of NCAA national titles by MIT student-athletes in the 2023–2024 academic year.

MIT varsity athletes won NCAA Division III national championships in eight individual and relay events this past year, including:

- Alexis Boykin '25, Women's Track and Field, in shot put and weight throw (indoors) and shot put and hammer throw (outdoors)
- Jackson Blied '26, Men's Outdoor Track and Field, in the high jump
- Kate Augustyn '25, Women's Swimming and Diving, in the 100- and 200-yard backstroke
- Augustyn, Edenna Chen '24, Annika Naveen '26, and Ella Roberson '27, Women's Swimming and Diving, in the 200-yard medley relay

“Our student-athletes exemplify the fact that high performance and success in athletics and high performance and success in academics are not mutually exclusive,” says MIT athletic director G. Anthony Grant.

“The same level of dedication our student-athletes put forward in the classroom is

exemplified in their particular sports,” he says. “The skills honed in varsity athletics complement MIT’s academic rigor. It’s a ‘yes and’ proposition, not an ‘either or.’”

With 33 varsity sports, MIT provides the most intercollegiate offerings of any NCAA Division III institution.

At the close of the 2023–2024 academic year, MIT finished seventh in the Division III standings for the Learfield Directors’ Cup, which recognizes excellence in athletic departments, with points awarded based on each institution’s finish in NCAA Championships.

MIT’s varsity teams have won 26 national championships since 1925. Sailing has the most, with 13. Most recently, NCAA Division III titles were won by Men’s Outdoor Track and Field in 2023 and Men’s Cross-Country in 2022.

MIT’s first NCAA title was won by track athlete Henry Steinbrenner 1927 in the 220-meter hurdles. Since 1927, MIT varsity athletes have won 72 individual and relay national championships.

Boykin, who came within one centimeter of adding a national championship in the discus to her titles in shot put and hammer throw at the NCAA Division III nationals in May, compares unleashing a winning throw to acing an exam.

“It’s like when you take a test and just know you’re writing all the right answers,” she says. “You’re putting in all your effort, and you know you’re going to get the payout.” —Mark Sullivan

## (7)

### Q&A: ALEXIS BOYKIN '25

In 2024, Boykin became the first MIT Women’s Track and Field athlete to win multiple events at the same NCAA championship meet.

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

## Renewed Sports Performance Center Benefits All Students



Spaces that promote health and wellness are critical to the Institute’s goal of supporting students in every aspect of their lives at MIT. With the help of MIT alumni and friends, the Sports Performance Center in the DuPont Athletic Building (W31) underwent a major renovation, recently reopening with triple the previous space and vastly improved facilities.

The center now provides ample open space for teams to train together, offering shock-absorbing floors, new equipment, and a turf sprinting area. The educational space was upgraded to include a flexible workspace for instructors to review lesson plans as well as private offices for meetings with students.

“Providing appropriate resources is an essential component of our student-athletes’ training programs,” says G. Anthony Grant, MIT’s athletic director and head of the Department of Athletics, Physical Education and Recreation (DAPER), noting that modernized and fully equipped training areas increase athletes’ competitive performance and reduce injuries. “The expansion of the sports performance facility has better positioned DAPER to meet the needs of our student-athletes as well as expanding training and teaching opportunities for the broader student population.”

# Connecting and Supporting Student Veterans

**Graduate students help create centralized office for veteran support and success**

In 2018, 35-year-old Omar Rutledge was accepted into a PhD program in brain and cognitive sciences at MIT. The acceptance was long sought and hard-won. Born in El Paso, Texas, Rutledge had spent much of his adult life in the US Army—including a 15-month combat tour during the 2003 invasion of Iraq that left him with chronic back pain and recurring PTSD. He finished his undergraduate degree in 2009 but was rejected by every graduate program he'd applied to. Undeterred, Rutledge vowed to become the best candidate he could be. He completed a master's degree in biomedical imaging at the University of California at San Francisco, then ran clinical trials in oncology and neuroscience laboratories at Stanford University.

Acceptance at MIT felt like the realization of a lifelong dream. And it was, except for one thing.

"One of the first things I did when I arrived at MIT was to look for other veterans here," says Rutledge. "People who have served in the military have a special form of camaraderie, a bond that you don't get from any other organization I'm familiar with. But there was no [integrated] organization that connected veterans on campus, nor was there a dedicated office to help veterans tap into their GI Bill benefits or other resources."

In his first few months on campus, Rutledge met a few fellow veteran students. That initial group formed the MIT Student Veteran Association (SVA), electing Rutledge as president after students returned to campus in 2021 following the pandemic. "We had three primary goals," says Rutledge, who hopes to complete his PhD in 2025: "Build a veteran community. Advocate for veterans on campus. And establish an office at MIT that would manage veteran issues."

By the end of the 2021–2022 academic year, SVA membership had grown from 10 to 65.

The group worked with then Vice Chancellor for Undergraduate and Graduate Education Ian Waitz to create the Office of Student Veteran Success and hired fellow vet Liam Gale as its program administrator. "My job is to help student veterans transition to life at MIT," says Gale, an Air Force veteran who served in various regions around the world. "I help connect student veterans to outside organizations including the US Department of Veterans Affairs and various nonprofit organizations that offer benefits and support for veterans and their families—everything from tuition to relocation services to childcare. Starting at MIT can be intense. The last thing new students want to be doing in their

first few weeks is spend hours on hold trying to find the right person or office to help them."

Today, there are more than 200 veterans enrolled at MIT. Most are graduate students, and many are enrolled at the MIT Sloan School of Management. "We work to help each veteran develop their own definition of success at MIT," says Gale. "One thing we encourage them to do is ask for help. Veterans tend to be self-reliant, to solve problems on their own. We want them to know they can reach out to administrators, to fellow students, and of course to us, with questions about everything from benefits to academic deadlines."

Gale is pleased that his office helps incoming veterans find community and support at MIT, with access to services, programs, and social events that benefit them and the entire MIT community. "Regardless of the branch in which they served, every veteran has a sense of professionalism and selfless service," says Gale. "They know how to focus on a task and see it through to completion. As almost all our veterans were supervisors, they are also great coaches and mentors, willing to share their experience and to give back. They will make sure to leave MIT a better place than it was when they arrived."

—Ken Shulman





Interphase EDGE/x students enjoy a BBQ on campus this past summer as part of their introduction to MIT.

PHOTOS: SIMON SIMARD

# A Head Start at MIT

## EDGE/x helps first-year students hit the ground running

Beginning as a student at MIT can be both exciting and daunting for even the best-prepared scholars. One recent first-year student described the experience as “going from zero to 60 in a nanosecond.” For students hoping to soften that initial jolt, as well as students who want a running start into the rigors of their first year at MIT, there is Interphase EDGE/x (Empowering Discovery Gateway to Excellence).

Founded in 1969, Interphase EDGE/x is a holistic experience that combines academics, community building, and individual development. Beginning in late June, incoming EDGE/x students spend eight weeks on campus (a smaller cohort participates in the program remotely and joins the main group on campus in week six). Students attend classes, workshops, and team-building exercises, mastering a series of skills that include oral and written communication and problem-solving.

“Interphase EDGE/x gives incoming students an opportunity to explore the campus, to develop friendships, to ramp up in certain subjects, and even a chance to earn physical education points and take their required swimming test ahead of time,” says Krissy Robinson, staff associate for academic success at the Office of Minority Education, which oversees the program. “When classes start in September, EDGE/x students have already moved into their dorms, met faculty and administrators, and formed friendships and community. MIT feels familiar instead of disorienting. They know where to look for opportunities and support. And students have a much better chance of succeeding.”

Students in the Interphase EDGE/x program call themselves “Interphasers.” They come from all backgrounds and origins. “The program was created to support students from diverse backgrounds,” explains Robinson. “We still actively seek scholars from varied ethnic, cultural, and socioeconomic origins, as well as those with unique life experiences. But all incoming students are invited to apply and take part in the EDGE/x program.”

While the eight-week summer session forms the main part of EDGE/x, students remain in the program through the end of the second semester of their second year. Many EDGE/x alumni sign on to work in the program during their junior and senior years on campus. “I started working with EDGE/x at the end of my sophomore year,” says Michaela Purvis ’24, an EDGE/x alumna. “I was a residential facilitator, helping incoming students adapt to dorm life,

**“It made me appreciate the type of person who is admitted to MIT, a person who does things because they are passionate about them,” says Meli Nabage.**



and then a residential advisor and a teaching assistant in chemistry class. A lot of us who did the program have come back to teach or mentor incoming EDGE/x students, because of what the program has done for us. We know the value of seeing friendly faces on campus during the first semester.”

Purvis, who participated in EDGE/x remotely during the Covid-19 pandemic, says the program definitely helped her academically. “Right after I was admitted, an MIT student called to tell me about the EDGE/x program,” she recalls. “He said it was a good opportunity to smooth my transition on campus and to fill some holes in my knowledge and skill set. That call, and the EDGE/x program, were among the reasons I chose MIT. He was right about filling those holes. If I hadn’t taken physics with EDGE/x over the summer, I don’t think I would have passed fall course 8.01—the introductory course on classical mechanics.”

But she notes that the social and emotional benefits of EDGE/x were even more valuable: “I attended a demanding boarding school for high school. There weren’t a lot of people who looked like me there, and I was already suffering from imposter syndrome. Now I was coming to MIT. But the EDGE/x program was really affirming. It helped me be more in touch with my identity and with how I interact with the world. Just sitting in with my cohort in a Zoom session—and later meetings in person—was enough to remind me that I do have a place here.”

While diversity remains a cornerstone of the EDGE/x program, incoming students experience that diversity in new and surprising forms. “Diversity isn’t just limited to one’s ethnicity or culture or language,” says Meli Nabage ’27, a rising sophomore student studying computer science and neuroscience. “People at MIT have diverse academic backgrounds and interests as well. Some members of my EDGE/x cohort were wild about chemistry. Others were interested in electronics and built computers in their spare time. These were new

worlds for me. It made me appreciate the type of person who is admitted to MIT, a person who does things because they are passionate about them, not just because it might look good on a college application.”

Nabage, who learned about EDGE/x during Campus Preview Weekend, says the summer program classes she attended gave her more confidence when she started regular classes in the fall. “I didn’t feel I had a solid base in physics. EDGE/x gave me a head start on the material and gave me a sneak peek into life on campus.”

In addition to making friends at EDGE/x, Nabage also learned how to work in a group. “In high school, I tended to do my work alone,” she recalls. “I think a lot of incoming students did as well. But they tell you that at MIT collaboration is everything. That no one can do physics alone. I was a little nervous about how I might integrate into a group. It was so useful to have practice solving problems as a group before the fall semester.”

Most of all, says Nabage, the EDGE/x program helped her overcome her doubts and fears about succeeding at MIT, not because these were unfounded, but because she learned that so many other incoming students had the same doubts and fears. “I was nervous about coming to such a notoriously rigorous school,” she recalls. “Of course, I expected everyone I met at MIT to be perfect and excel at everything. Instead, I met students who shared my apprehensions, students who might be great at calculus but struggle with chemistry. It was reassuring to learn that everyone had their strengths and weaknesses, their doubts. It made me feel seen and reassured me that I wasn’t alone.” —Ken Shulman



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KAYSON NYI '65

## Leading by Example

“The reason my fraternity (Chi Phi) meant so much to me is that I came to MIT at age 16,” says Kayson Nyi '65. “I didn't know how much out of my depth I was. I had a rough first semester but the upperclassmen in the fraternity helped me to survive and to graduate on time.”

As Nyi sees it, MIT gave him opportunities. “It opened doors because people saw the MIT degree in the record even though it wasn't from an outstanding student.”

When Nyi was in a position to make philanthropic gifts, he chose to support the Independent Residence Development Fund (IRDF) established by alumni in 1964 to provide financial support to MIT's fraternities, sororities, and independent living groups, hoping to help provide the kind of undergraduate experience that meant so much to him for today's students. “My wish is that MIT's independent residences survive—because I think that they offer something special.”

Nyi fondly recalls the Chi Phi residence at the intersection of Hereford Street and Commonwealth Avenue in Boston. “It was



magnificent 60 years ago, and it has been well maintained. I was told recently in a visit that the IRDF has made funds available for Chi Phi over the years at some significant level for capital improvements.”

Perhaps the biggest advantage of his MIT education, Nyi reflects, was the assurance he gained. “When you get through MIT, there is a confidence that comes from that saying, ‘if I can do this, I can do anything.’” —Christine Thielman

PHOTO: JUSTIN MUIR

PAUL DAVID TOMPKINS '92 (1970–2022)

## Scholarship Honors Lifelong Learner and Explorer

Friends and colleagues of Paul David Tompkins '92 (1970–2022) remember him as a person who never did anything halfway. Mountain climbing and scuba diving took him all over the world. He had his helicopter pilot's license, a black belt in karate, and proficiency in Japanese and Spanish. He took medieval history courses at MIT, and it was a common sight to see him working on chain mail in his spare time.

Space, though, was a lifelong passion, which led to him majoring in aeronautics and astronautics at MIT. Tompkins went on to become lead flight director for NASA's Lunar Crater Observation and Sensing Satellite mission, which discovered water under the moon's surface in 2009. Paul worked at SpaceX from 2010 to 2019, taking a leading role to develop, document, and direct operational procedures and flight rules for Cargo Dragon and Crew Dragon flights, which performed the first-ever commercial spacecraft rendezvous with the International Space Station and Earth through deorbit, entry, and landing.

His most recent employer, Blue Origin, sent a plaque into space that honored his memory as an explorer who was “dedicated to expanding humanity beyond Earth.”

“He loved life, and sharing what he loved with other people,” says his mother, Mimi.

After graduating from MIT, Paul earned a

master's degree in mechanical engineering from Stanford University and master's and doctoral degrees in robotics from Carnegie Mellon University. He traveled extensively to research his dissertation, “Mission-Directed Path Planning for Planetary Rover Navigation,” testing the rover on landscapes like the Canadian Arctic and the Atacama Desert in Chile — the driest desert on Earth.

Mimi Tompkins knew that endowing a scholarship gift to support current and future students on their own educational journeys would be a fitting way to honor her son's memory.

“Paul was always reaching to the moon and beyond, and his MIT degree launched him on the career of his dreams,” she says. “I wanted to make a scholarship gift that will last in perpetuity so that others achieve their goals as well, and so that his name will be remembered.”

Friendships formed at MIT also made a profound impact on his life, his mother notes, recalling the bittersweet experience of joining her son's Theta Chi fraternity brothers at what would have been Paul's 30th MIT Reunion.

“Paul would be proud to know his contribution will assist others in fulfilling their dreams. He never missed an opportunity to inspire, encourage, and support his fellow human beings in making their dreams come true.” —Joelle Carson



MICHAEL '87 AND KATHLEEN SCHOEN

## In Support of “Body, Mind, and Spirit”

When Michael Schoen '87 was earning his bachelor of science at the MIT Sloan School of Management, joining his fraternity, Lambda Chi Alpha, and participating in team sports helped him make the most of his years at MIT.

“MIT changed my life,” says Schoen, who played on rugby and varsity soccer teams. “But without athletics and my fraternity, I’m not sure I’d have gotten through MIT. I was the first kid in my family to attend college. When I first arrived from Ohio, I was punching over my weight. Running on the soccer field and rugby pitch and friendships in my fraternity helped me move forward through MIT in a good way.”

Schoen cites former MIT president Howard Wesley Johnson, who also served as chair of the MIT Corporation and dean of MIT Sloan, as one of his mentors. “To have someone of his caliber help me think about my future is just one example of what things were like time and again at MIT. I want to say thank you by supporting what helped me survive and thrive at MIT, which for me was athletics and my fraternity.”

Soon after graduating, Schoen began his ongoing support of the MIT Department of Athletics, Physical Education and Recreation (DAPER). Taking a more active role, he worked with Donald E. Shobrys '75, a track-and-field athlete and now director of the MIT Venture Mentoring Service, and Professor Emerita Candace Royer, then director of DAPER, to start Friends of DAPER, an alumni organization that raises funds and recruits volunteers for the department. Schoen also accepted an invitation to join the DAPER Visiting Committee.

“Nothing is more important than the whole person—body, mind, and spirit,” says Schoen. “Doing things I love and being challenged help me to feel healthy and strong and to do well. Athletics is part of the lives of many students and applicants. With athletic programs worthy of MIT and the students at MIT, we attract and keep the best students.

“MIT is the best school in the world, a school that can change the world and save the world. I’ve interviewed phenomenal applicants who were competing in sports at the highest level in high school. With

top-notch facilities and more full-time coaches, MIT won’t lose great applicants who want to keep playing high-level sports.”

Noting that MIT’s intramural and physical education programs are equally important, Schoen says, “When I visit MIT, I see how facility upgrades and innovative programming are benefiting all students, not only varsity athletes.”

Schoen’s interest in care of the whole person—body, mind, and spirit—is shared by his wife, Kathleen, a clinical nutritionist. Parents of Nuala, 30, Quinn, 28, and Nikki, 26, they regard philanthropy as a family affair, and their priorities include cancer research and patient care.

“Cancer affects many families, including ours,” says Schoen, who chairs the board of the HealthCare Chaplaincy Network, a nonprofit that advances integration of spiritual care, including professional chaplaincy services, into clinical treatment.

“In the late 1940s, while my dad was in college on the GI Bill, his father was diagnosed with cancer. My father dropped out to work and to support his mother and sister. He never got to finish his degree and follow his passion—to be a sportswriter. And in 2009, my mother passed away quite suddenly and unexpectedly from small cell lung cancer.”

Not long after, Schoen met with John Oyler '90, a fraternity brother, who was starting a company, BeiGene, designed to develop more accessible and affordable cancer treatments. In 2017, after 30 years of leadership roles at such investment banks as JP Morgan, DLJ, and Credit Suisse, Schoen joined BeiGene. He is now strategic advisor and special assistant to Oyler, BeiGene’s chairman and CEO. “After following BeiGene from its very beginning,” says Schoen, “I came to realize I wanted to be part of it. It’s been a beautiful adventure ever since.” —Susan Saccoccia



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## RESEARCH, PICTURED

Felice Frankel, a photographer and research scientist in MIT's Department of Chemical Engineering, celebrates 30 years with the Institute in 2024. To create this image of ferrofluid, a suspension of nanoparticles that responds to magnetic fields, Frankel placed a 4 cm drop of the material on a glass slide, arranging a yellow sticky note and seven circular magnets underneath. Her work has appeared in articles and on the covers of journals and other publications, helping to draw attention to important research at MIT. The author of several books, she is now working on a handbook series for communicating science and engineering called *The Visual Elements*. Frankel leads workshops on campus about the importance of images and graphics not only for journal submissions, but also as a powerful means of engaging the public with science. View her work at [felicefrankel.com](https://felicefrankel.com).

PHOTO: FELICE FRANKEL