EQUAD NEWS

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Spring 2026, Volume 37

SPORTS

The Engineering Student Athlete

PRINCETON ENGINEERING

DEAN'S NOTE

Embracing the true student athlete experience

This issue of EQuad News was born of a mini-reunion last fall. I had lunch with a handful of my '00 classmates who work at Princeton, including John Mack, the Ford Family Director of Athletics. John and I first met on an orientation trip before our first year in what is now called Community Action, volunteering in Trenton by day and sleeping on the floor of Colonial Club's library at night.

One memory led to another, as they so often do, and I began reflecting on all the incredible athletes I knew as a (very unathletic) student, and on how our experiences of this magical place are largely the same. In a moment when college athletics is undergoing a tidal shift nationally, with name, image, and likeness payments, the transfer portal, and an athletic experience that is becoming increasingly disconnected from the student experience, student athletes at Princeton stand apart.

Student athletes engage in every field this campus has to offer, including here at Princeton Engineering. Engineering is not easy, and I have always marveled at how our engineering athletes navigate practices and games on top of weekly problem sets and long hours in lab. What better way to celebrate the Princeton athlete experience than to share stories of some of our many current engineering student athletes!

View the new online version of EQuad News with more photos of our student athletes. engineering.princeton.edu/equad-magazine/sports

Photo by David Kelly Crow

Andrew Houck '00
Dean | Anthony H.P. Lee '79 P11 P14 Professor of Electrical and Computer Engineering

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In the Nation's Service and the Service of Humanity

RECENT HIGHLIGHTS

Photo by Tori Repp/Fotobuddy

Major Venture Forward gift names Sarofim Pavilion in Princeton's new engineering buildings

A gift from the Sarofim Foundation has named the Sarofim Pavilion, which will serve as an academic home to part of the Department of Chemical and Biological Engineering (CBE).

"We are deeply grateful to the Sarofim Foundation for this extraordinary Venture Forward gift," said President Christopher L. Eisgruber '83. "Their generosity has helped us build state-of-the-art facilities that will spark creative inquiry, enhance research in CBE, and enable collaboration across engineering and the sciences."

The 10,000-square foot Sarofim Pavilion connects to the new CBE laboratory building, which is the northern entrance into the University's new Prospect Avenue neighborhood for engineering and environmental studies. CBE previously was housed in the Engineering Quadrangle, which opened in 1962.

"The Sarofim Pavilion provides a beautiful entrance into both our new neighborhood and into a new era for the School of Engineering and Applied Science," said Andrew Houck '00, dean of engineering.

The Sarofim Foundation was established by the late Fayez Sarofim, who had a legacy of philanthropy supporting organizations in Houston, Texas, and beyond. Sarofim founded Fayez Sarofim & Co. in 1958, which became the Southwest's largest investment advisory firm. Early clients included nonprofits, endowments, and foundations that shaped his personal philanthropic vision, which focused particularly on education, health care, and the arts.

"My father's philosophy was to 'bet on people first,' and we are honored to make, as President Eisgruber says, an 'audacious bet' through this gift on the extraordinary faculty, students, and researchers whose discoveries will make a difference beyond Princeton," said Christopher Binyon Sarofim '86, chairman of both the Sarofim Foundation and Fayez Sarofim & Co.

Photo by Tori Repp/Fotobuddy

Small groups, big impact: 'Clusters' seek next research frontiers

Engineering professors Andrew Houck '00 and Nathalie de Leon worked in different areas but shared a vision of quantum information science. And they pulled together others, creating a website, organizing seminars, recruiting faculty. Along the way, the growing group took on national leadership roles, built a major Princeton initiative, and delivered groundbreaking advances in quantum computing.

Now, as dean of engineering, Houck is applying this approach to drive new waves of unforeseen advances. His initiative, called Clusters of Excellence, focuses the strengths of experts from diverse fields to produce new kinds of research.

"Often the most exciting areas of science and engineering emerge from experts in different fields who realize they are interested in the same questions," Houck said. "These small clusters can grow to produce previously unimagined benefits for society and new generations of researchers who think creatively and collaboratively."

Following a call for proposals last fall, funding from the engineering school will allow the clusters to create seminars and build visibility across engineering and other areas of Princeton University. Included in the 11 clusters are groups analyzing the fundamental interactions of microbes, space exploration and development, and the ecological transformation of groundwater.

Houck, appointed dean in August 2025, said the Clusters of Excellence initiative is timely given the substantial growth in the number of Princeton Engineering faculty. The school has added about 40 faculty members since 2020. The clusters offer an opportunity for new and established scholars to build collaborative networks, he said.

"Many of our centers and institutes started with small groups getting together and forging a community," Houck said. "I'm excited to see what emerges from these impressive collections."

Learn more about the 11 new Clusters of Excellence

Princeton's new quantum chip built for scale

In a major step toward practical quantum computers, Princeton engineers have built a superconducting qubit that lasts three times longer than today's best versions.

"The real challenge, the thing that stops us from having useful quantum computers today, is that you build a qubit and the information just doesn't last very long," said Andrew Houck '00, a leader of a federally funded national quantum research center, Princeton's dean of engineering and co-principal investigator on the paper. "This is the next big jump forward."

In an article in the journal Nature, the Princeton team reported their new qubit lasts for over 1 millisecond. This is three times longer than the best ever reported in a lab setting, and nearly 15 times longer than the industry standard for large-scale processors. The researchers built a fully functioning quantum chip based on this qubit to validate its performance, clearing one of the key obstacles to efficient error correction and scalability for industrial systems.

Quantum computers have shown the potential to solve problems that cannot be addressed with conventional computers. But current versions are still in early stages of development and remain limited. This is mainly because the basic component in quantum computers, the qubit, fails before systems can run useful calculations. Extending the qubit's lifetime, called coherence time, is essential for enabling quantum computers to perform complex operations. The Princeton qubit marks the largest single advance in coherence time in more than a decade.

Houck, the Anthony H.P. Lee '79 P11 P14 Professor of Electrical and Computer Engineering, said a quantum computer's power hinges on two factors. The first is the total number of qubits that are strung together. The second is how many operations each qubit can perform before errors take over. By improving the quality of individual qubits, the new paper advances both. Specifically, a longer-lasting qubit helps resolve the industry's greatest obstacles: scaling and error correction.

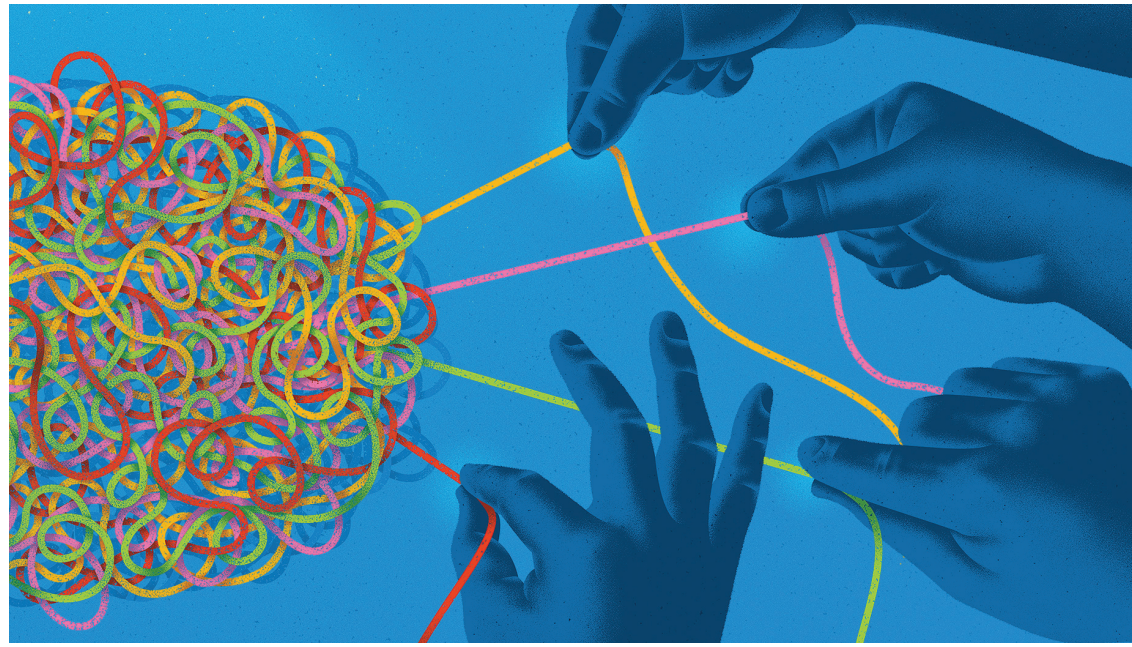
Houck collaborated with Nathalie de Leon, an associate professor of electrical and computer engineering, and Robert Cava, Princeton's Russell Wellman Moore Professor of Chemistry. Experimenting with unique material combinations, researchers from all three labs built a superconducting tantalum circuit on a silicon substrate.

The benefits of these improvements scale exponentially with system size, Houck said. Swapping Princeton's design into industry-leading computers would enable those systems to work thousands of times better. The work is "a major breakthrough on the path to enabling useful quantum computing," he said.

–by Alaina O'Regan

The new chip represents the largest advance in superconducting quantum hardware in more than a decade. Photo by Matthew Raspanti

Illustration by Koukou Sakai for the Simons Foundation



Major autism study uncovers biologically distinct subtypes, paving the way for precision diagnosis and care

Researchers at Princeton University and the Simons Foundation have identified four clinically and biologically distinct subtypes of autism, marking a transformative step in understanding the condition's genetic underpinnings and potential for personalized care.

Analyzing data from over 5,000 children in SPARK, a study funded by the Simons Foundation, the researchers used a computational model to group individuals based on combinations of traits. The team considered a range of over 230 traits, from social interactions to repetitive behaviors to developmental milestones, rather than searching for genetic links to single traits.

This approach enabled the discovery of clinically relevant autism subtypes, which the researchers linked to distinct genetic profiles. Their results were published in Nature Genetics.

"Understanding the genetics of autism is essential for revealing the biological mechanisms that contribute to the condition, enabling earlier and more accurate diagnosis, and guiding personalized care," said senior study author Olga Troyanskaya, director of Princeton Precision Health, the Maduraperuma/Khot Professor of Computer Science and the Lewis-Sigler Institute for Integrative Genomics at Princeton, and deputy director for genomics at the Center for Computational Biology of the Simons Foundation's Flatiron Institute.

The study defines four subtypes of autism:

- **Social and Behavioral Challenges:** This group shows core autism traits, including social challenges and repetitive behaviors, but generally reaches developmental milestones at a pace similar to children without autism. They also often experience co-occurring conditions like ADHD.
- **Mixed ASD with Developmental Delay:** This group tends to reach developmental milestones, such as walking and talking, later than children without autism, but usually does not show signs of anxiety, depression, or disruptive behaviors.
- **Moderate Challenges:** This group shows core autism-related behaviors, but less strongly than those in the other groups, and usually reaches developmental milestones on a similar track to those without autism.
- **Broadly Affected:** This group faces more extreme and wide-ranging challenges, including developmental delays, social and communication difficulties, repetitive behaviors, and co-occurring psychiatric conditions.

–by Molly Sharlach

Learn more about autism traits and their underlying genetics

SPORTS

Engineering student athletes train and compete at a high level while also designing robots, building computer algorithms, and planning for climate resilience. These stories feature a few of Princeton Engineering's more than 180 student athletes.

Photo by Row2K/Ed Hewitt

Photo by Denise Applewhite

Rower-engineer awarded Pyne Prize, Princeton's top undergraduate honor

Braeden Carroll is a recipient of the 2026 Moses Taylor Pyne Honor Prize, the highest general distinction conferred on an undergraduate. The prize, established in 1921, is awarded to seniors who have manifested excellent scholarship, strength of character, and effective leadership.

Carroll, from Kinnelon, New Jersey, is majoring in civil and environmental engineering. He is a recipient of the Shapiro Prize for Academic Excellence, a two-time winner of the George B. Wood Legacy Prize, and an early inductee into the Phi Beta Kappa Society. Carroll also rows for the men's varsity lightweight rowing team.

Carroll's academic pursuits have bridged engineering, the humanities, social sciences, and policy studies, including extensive interdisciplinary fieldwork. His senior thesis, an analysis of walls in historic timber barns, combines his major in civil engineering and his interest in sustainability. The work has implications for understanding the structural behavior of historic timber barns and for developing preservation methods.

Carroll plans to combine the analytical and quantitative skills gained at Princeton to contribute to work in clean technology and sustainable energy.

–Adapted from a story by Erika Knudson, Advancement Communications

Wrestling dumb: A life in balance

In grade school, the Garibaldi brothers struck a deal — Sebastian, the elder, would put the Lego sets together, Gabe, the younger, would play with them once they were built.

"I never liked playing with toys," the elder said. "I just liked feeling the pieces snap together."

Now Sebastian, heavyweight wrestler, mechanical engineer, is closing in on his final months as an NCAA Division I student athlete. His brother Gabe is just getting started, now a first-year student wrestling on the Princeton team. Come May, Sebastian will have wrestled his last match, turned in his last problem set. The balance of his life will shift.

But Garibaldi isn't bothered. He's got a job lined up developing a robot that does housework. He spends the few days he has to himself at home on Long Island with his family. He plays a cherry red flamenco guitar.

He said engineering problems activate his analytical mind, while wrestling activates something almost purely physical. "Brutish," he said.

At 285 pounds, he generates plenty of force. But in wrestling, no matter how strong you are, you also have to be quick. Quicker than the man trying to snap your face to the mat.

"The second you stop to think, you've taken a second," Garibaldi said. At his best, he wrestles a little bit dumb. No thinking. Mind quiet. Ready to strike. **–by Scott Lyon**

Photos by Sameer A. Khan/Fotobuddy, Princeton Athletics/Lisa Elfstrum

Photo by Princeton Athletics/Sideline Photos

From hurdles to heat mapping: Bringing it all together

Growing up pursuing a sport that requires mastery of sprints, hurdles, shot put, and high jump, Julia Jongejeugd knows how to do more than one thing well. And not just in sports.

As a preschooler, Jongejeugd was captivated by track and field events on TV, and at age 6 she began training at a club near her home in the Netherlands. She also started creating virtual cities in video games, and heard a talk by an architect that spurred her interest in the built environment. She chose Princeton because it was one of the few places where she could combine engineering studies with high-level competition in the pentathlon and heptathlon.

Now a senior in civil and environmental engineering, she is seeking new approaches for relieving heat stress in cities. Her senior thesis focuses on interactions between building height, tree canopy, and urban heat. By integrating satellite imagery with data sets on buildings and trees, "I'm trying to simulate real-world neighborhoods without actually having to do a field survey," said Jongejeugd.

With Chennai, India, and Accra, Ghana, as test cases, she hopes to gain insights into how Global South cities can mitigate rising temperatures. Few analyses have considered the roles of both buildings and tree canopies. "A lot of studies focus on one or the other," she said. "I want to bring it all together."

Bringing it all together is what Jongejeugd does as an athlete. While the 60-meter hurdle race is her forte, she also excels at the high jump and at throwing javelin and shot put. She was crowned Ivy Champion in the outdoor heptathlon in both 2024 and 2025, and the indoor pentathlon 2025.

In her final season at Princeton, Jongejeugd is training for more track and field victories while planning for a civil engineering master's degree in Europe.

She would love to compete at the World University Games in 2027, and is also looking to try a decathlon, which would mean training for new events like discus and pole vaulting. But hurdles will always be her favorite.

"You just focus on the first hurdle, and then you get into your rhythm," she said. "You just have to keep up your rhythm and move as fast as you can go. If you're having a good race, you can feel it."

–by Molly Sharlach

Contagious energy

Tyler Harris is a team player, but when he arrived at Princeton in 2023, he found himself without a team.

"I love being on a team," Harris said, now a junior. Teammates provide energy and focus. "You're bouncing ideas off each other, you're communicating, you're working together."

Harris played football, basketball, and lacrosse in high school, but hadn't been recruited by Princeton.

"Sports have always been a part of my life," he said. "I knew I wanted to play a sport in college." He focused on lacrosse, trained during the summer, and joined the team in the fall.

Not long after, he joined another team: the mechanical and aerospace engineering department (MAE). He was drawn to the hands-on approach and collaborative style of MAE courses.

One of his favorite classes was Engineering Design, where students learn to design and build products in groups. In MAE, even individual assignments, like problem sets, can be done collaboratively. "When I start to study alone, I lose motivation," he said.

Last summer, Harris worked in assistant professor Ryne Beeson's lab on a project to identify stable low-altitude lunar orbits. The moon isn't a perfect sphere and has uneven gravity, so finding such orbits is difficult. Harris worked with two graduate students to build models and simulate orbit paths.

Lately, he's become fascinated by aerospace, particularly innovations in commercial aviation. Companies are building electric planes, faster planes, planes that are more environmentally friendly. He's taking courses on aerospace design and energy conversion and the environment in the spring semester, hoping to broaden his experience in aerospace engineering.

It's also an exciting semester for the men's lacrosse team, which was ranked second in Division I. "Our goal is to win a national championship," Harris said. "We talk about it every day. It's awesome to walk in the locker room and have that energy. It's contagious." **–byJulia Schwarz**

Photo by Princeton Athletics/Sideline Photos

Princeton engineers coach middle schoolers in rowing and robotics

From the moment she took her first strokes in a training barge on Mercer Lake, Mimi Cuevas knew she had found much more than a new afterschool activity.

"In middle school, things were so hectic," said Cuevas, now a junior at Pennsbury High School in Fairless Hills, Pennsylvania. But after rowing practice, she felt "peace throughout my day."

Cuevas is one of more than 40 students who have learned to row through Princeton's STEM to Stern program since it began in 2021. STEM to Stern brings middle schoolers from the Princeton area to the University and to Caspersen Rowing Center in nearby Mercer County Park, where Princeton's rowers — including many engineering students — coach them in rowing and science and engineering projects.

Launched in 2016 in Milwaukee, the nonprofit works with 24 partner rowing clubs nationwide to eliminate barriers to rowing and offer hands-on STEM learning to students from under-served communities.

The goal is to connect rowing programs with nearby communities and "help bridge that gap," said Greg Hughes '96, head coach of Princeton's heavyweight men's rowing team and the president of STEM to Stern's board of directors.

"It's a great learning and teaching experience" for the Princeton rowers, Hughes said. "It's the first time they're actually in charge of running a practice."

Two afternoons a week, the program brings students from Trenton middle schools to Mercer County Park or the University's boathouse — in the winter, Princeton's indoor rowing tanks mimic training on open water.

After an hour of rowing practice, Princeton rowers lead STEM projects such as bridge design, rocketry, and computer coding — often taking the middle schoolers into the University's labs and collaborating with Princeton student clubs.

Katie DiPaola, a senior computer science major who has rowed on the women's open team, began leading the STEM sessions in her sophomore

Princeton rowers work with STEM to Stern students twice a week in an engineering teaching lab and at the Shea Rowing Center. Photos by Sameer A. Khan/Fotobuddy

year. Every week, she gets excited to explore new topics with the middle schoolers while fostering their teamwork and problem-solving skills. DiPaola herself fell in love with computer science around sixth grade. Watching her mother doing IT work, she went from being mystified that "she could control the computer with these lines or words" to teaching herself to code. Now, she said, "I can get lost doing it for hours."

This year, Princeton is one of six STEM to Stern sites around the country where students are preparing for a VEX Robotics competition, to be held at Princeton in July. For the competition, the students are building and programming robots to carry out tasks like stacking blocks and playing freeze tag.

Bruce Boyd, a youth development specialist in Trenton who serves as a liaison between the University, the middle schools, and students' families, said that visits to Princeton's campus are an added benefit of the program.

"They may have heard about Princeton, but to come [to campus] and go into an engineering lab, it opens their eyes up to possibilities," said Boyd. "Maybe they never even thought about going to college, and now it's on their mind."

Several STEM to Stern alumni have continued rowing in high school through the Princeton National Rowing Association's Mercer Rowing programs. Cuevas now practices six days a week with Mercer Rowing's varsity team and is looking forward to competing in the Mid-Atlantic Youth Championships and other races this spring.

"I really do think that rowing should be known way more," said Cuevas. She loves telling her friends and family about the sport and the work that goes into mastering it. She sees value in sharing something that has "brought me a lot of peace and comfort and knowledge."**–by Molly Sharlach**

Malinka Kwemo (above) on the rugby field and (right) at Mpala Research Center in Kenya. Photos by Shelley Szwast, Corinne Jordan

A commitment to connect

Thousands of miles from Princeton, Malinka Kwemo polishes her camera lens, caked with dirt after days of staking out endangered zebras and the researchers who track them.

At Mpala Research Centre in Kenya, Kwemo and her classmates are filming a documentary on the Princeton Zebra Project, a long-term research effort to study Grevy's zebras and develop conservation strategies.

The trip is part of an anthropology course on multispecies filmmaking. While not a typical winter break for an electrical and computer engineering major, the class helped Kwemo, a junior, articulate a long-term interest. "There's so much engineering behind all of this," she said, referring to filmmaking. "Maybe my niche is high-tech cameras — working in film but bringing in a technical background."

The course is far outside of her core requirements. For Kwemo, that's the point. Taking a breadth of classes reveals new ways of thinking about engineering and how it intersects with other fields. "There's anthropology in coding, there's anthropology in computers," she said. In machine learning, for example, programming is inspired by how the human brain works.

That instinct to connect rather than compartmentalize also serves Kwemo in her role as a captain on Princeton's women's rugby team. Instead of treating the demands of athletics and engineering as competing forces, she combines them into one. "The key is to do them together as much as possible," she said.

That means staying after practice to film the men's rugby team for a project, doing engineering homework on the bus to practice, and keeping an open dialogue with her coaches and professors.

In juggling all of this, Kwemo has never worried that she won't pass a class. Instead, she thinks in terms of how much work she'll need to do and how she'll get the resources she needs, knowing that her teachers and coaches want her to succeed.

On the field, that self-assurance helps her recognize a flicker of doubt in her opponent's eyes that tells she's going to make a play. "That honestly gives me the confidence to tackle them," she said. "Believing you can achieve it before you actually achieve it is something I use in both rugby and engineering." **–by Alaina O'Regan**

Algorithms for swimming, and life

Before mounting the starting block at DeNunzio Pool, Conor McKenna optimizes variables.

"There's stroke counts and tempos and a lot of visual aspects of technique," said McKenna, a senior majoring in computer science. "There's heart rates and pace, the amount of resistance used, the exertion throughout the set — this number of repetitions at this intensity with this amount of rest in between. In the weight room, tracking velocities on various exercises, tracking the amount of weight used, and just trying to use as much information as can possibly be gathered."

This kind of analytic discipline propelled McKenna to Olympic tryouts while still in high school in Frisco, Texas. It led to his role as co-captain of the Princeton swimming and diving team and all-Ivy and all-American honors as a student athlete.

It's also a formula that has benefited — and benefited from — his academic successes.

By his junior year, McKenna was working on two independent computer science projects. One, part of Computer Science 333, improved students' ability to sort through available floor plans and configurations in the annual room draw. It worked so well that the students who run the widely used TigerDraw app adopted the innovations that McKenna and his collaborators created.

Photos by Sameer A. Khan/Fotobuddy, Sideline Photography/Ryan Samson

At the same time, McKenna launched an independent research project to create a video game. He had never created a game, nor worked in 3D modeling and animation. "I sort of went into the project blind," he said. His focus became the "hierarchical finite state machine" to control how characters in the game respond to player inputs. After 15 weeks, McKenna produced a working version, which earned him the Department of Computer Science's Exemplary Independent Work Award.

Success, whether in the pool or in computer science, has been about creating efficient sets of steps to achieve a desired output. "Learning how to program and learning all these algorithms and how to think algorithmically, I think connects to a lot of things in life, athletics especially," he said.

"I think it's all process-oriented for me," said McKenna. "Trying to improve myself in various facets of life." **–by Steven Schultz**

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