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CHARTING THE UNKNOWN

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BY JULIA QUINN-SZCESUIL; PHOTOGRAPHY BY JIM GENSHEIMER

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LETTER

FROM THE EDITOR

Letters to the editor may be altered for length, clarity, and accuracy. We ask that letters offer the reader's opinion without rancor. Letters that mock or insult will not be published. Opinions expressed do not necessarily reflect the views of WPI. Send your letters to wpijournal@wpi.edu.

The production cycle of a quarterly magazine is like a non-stop merry-go-round at the amusement park. The pace can be exciting, unrelenting, and occasionally dizzying until you get used to the spin. As I jump aboard as editor of the *WPI Journa*l, I'm looking forward to a fun and rewarding experience.

I'm certainly no stranger to Worcester, having spent more than 20 years of my career at other institutions of higher education in this city. I came to this job with an outsider's admiration of WPI's project-based education, notable faculty researchers and teachers, and the STEM-minded students who are destined for great careers.

Two months after becoming an official insider, I've learned some other interesting WPI quirks—such as how the grading system (A, B, C, No Record) encourages collaboration and risk taking; the height of the water bubbling up in Freeman Plaza is determined by wind speed monitors on top of the nearby buildings; and why crossing Earle Bridge holds greater importance at the beginning and end of a student's WPI career.

I've also learned that innovators are embraced, supported, and nurtured here, and a few of those stories are told in this issue. I admire the fearlessness of **Manasi Vartak '10**, an entrepreneur succeeding in an industry dominated by men, and the audacity of **Ryan McDevitt '03** and **Matt Shea '03**, whose propulsion technology is in three satellites now circling the planet. You can also read about how students, faculty, and alumni are being helped by a comprehensive entrepreneurial ecosystem that includes mentors, seed money, and technical help.

I know I've only scratched the surface in getting to know this unique place, so please let me know if you have story ideas that will help me learn more.

—Kristen O'Reilly

Gompei ♥ Starbucks and Pho U

New food options, including a new Starbucks, came to The Goat's Head in Founders Hall this fall. Chartwells, the company that manages WPI's dining services, also added two concept restaurants—Pho U, and Paper Lantern—that will evolve and change every seven weeks. While the full-service Starbucks covers the Frappuccino, latte, and baked-goods crowd, Paper Lantern's fare is fast-casual Asian, with Pho U serving up dim sum, ramen, pho (a Vietnamese soup), and other pan-Asian fusion items.

PHOTO BY MATTHEW BURGOS

[A CONVERSATION WITH THE *president*]

PHOTO BY MATTHEW BURGOS

FEATURING

Deans Debora Jackson of The Business School and Mimi Sheller of The Global School

LL: I'm so excited to be here with our two newest deans.The Global School and The Business School are essential to WPI, helping to provide our STEM students with the critical skills that help them transform lives and make meaningful impact. Talk to us about that.

MS: Thanks, Laurie. The reason I came to WPI was because I love the way STEM education is integrated with business and with global learning, with projects and with teamwork and interdisciplinary work all around the university. I think that's just so important for STEM students to learn those skills. The Global School is on this fantastic growth trajectory to really expand that kind of education.

DJ: We've been conferring business degrees at WPI for over 70 years, and have been able to take business principles and technology and bring them together to make an impact on developing sustainable solutions for responsible global impact. That's what we do. And that's what's so exciting.

LL: Yes, and more of our students need to get those skills, even if they aren't getting a degree in The Business School. You're both developing great new programs for our current students, also for returning alumni and postgraduate degrees. What are some of the new programs in The Business School?

DJ: At the undergraduate level, we are so excited about a new course that we're offering in D-Term called "WPI Means Business." I call it a survey course that will allow students to get exposure to several business disciplines—entrepreneurship, value creation, marketing, finance—so that they can understand how it might impact their careers. And then at the graduate level, we've redesigned all of our graduate programs to be online, as well as on campus. The online format is delivered asynchronously—exactly how learners want to learn today.

LL: Perfect. Really responsive to what we're hearing from our alumni and others about what they want from us. And The Global School has exciting new programs, too.

MS: Yes, we recently launched the new master's degree in community climate adaptation at a crucial time, when we are seeing the drastic impacts of storms, flooding, drought, and fires, locally and globally. When the United States needs to launch a new workforce in climate adaptation for communities, we hope to be preparing our students for those jobs.

LL: And just really the first of many new programs coming out of The Global School, in addition to continuing to deliver our signature Global Projects Program available to all of our students. So, really exciting.

MS: Absolutely! We also are working with other WPI schools on new interdisciplinary graduate programs in key areas such as Science and Technology for Innovation in Global Development, Global Health, and Transregional Studies, all of which include WPI's model of global project-based teamwork.

LL: You both are new in your roles over these past few months. Debora, you are a two-time WPI alum and a former trustee. You obviously know WPI well. Mimi, you are brand new to our community. I would love to hear from you both what's really struck you in your first weeks and months in your roles as deans. What's got you excited?

DJ: You're right, I've seen WPI for decades—as a student and as a trustee—and now being able to help shape and pour [knowledge] into the students, the way that others poured into me when I was at WPI, is really exciting.

MS: And for me, I'm just so impressed by how collaborative it is here. I've reached out to engineers, to folks in The Business School, arts and humanities, and social sciences. And the students are open-minded, they're engaged—it's a wonderful atmosphere to work in.

LL: So great to hear. Just endless possibilities, right? I'm so happy that you're both here at WPI, leading two amazing schools.

WPI

The latest in university news, research, and commendations

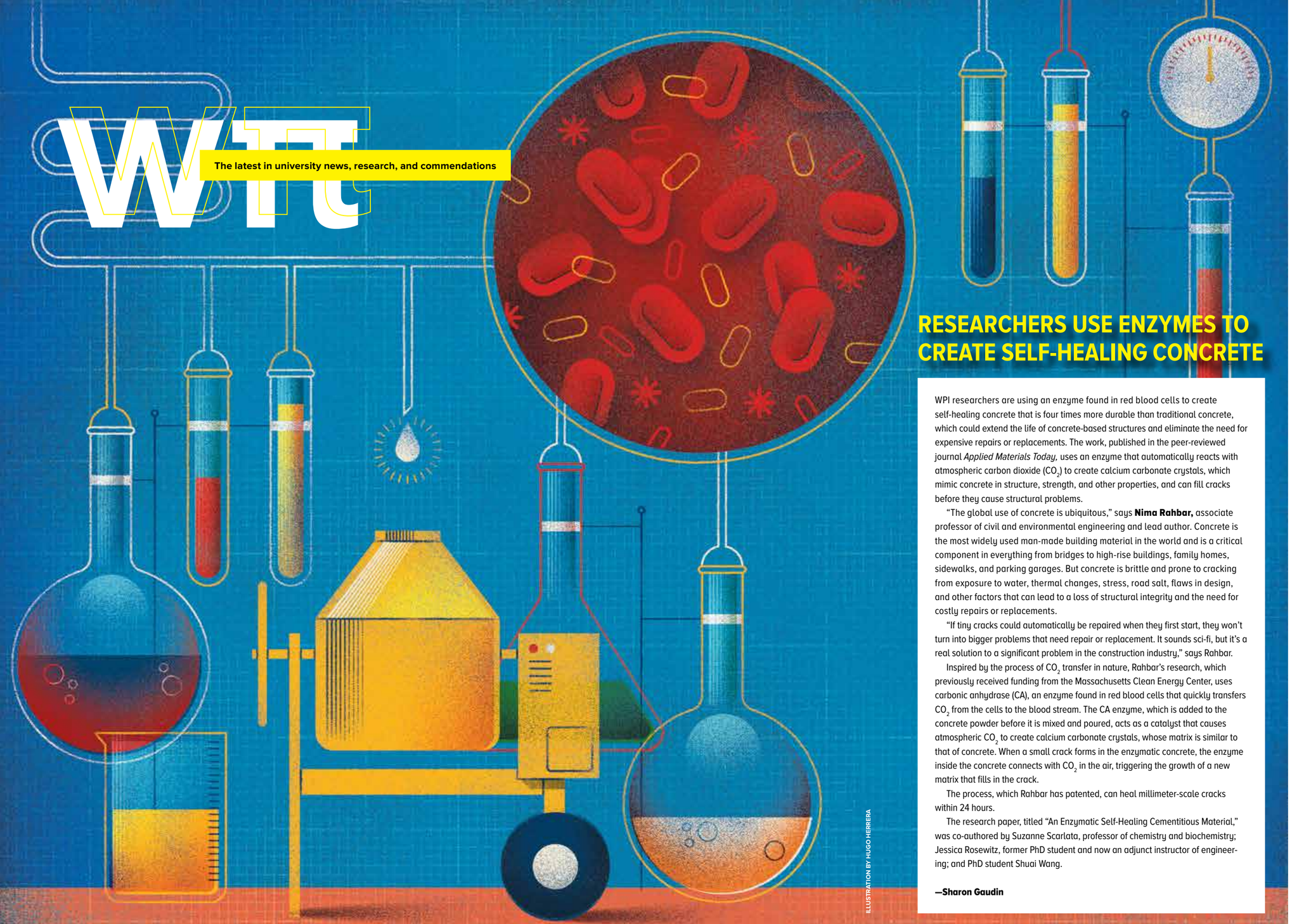


ILLUSTRATION BY HUGO HERRERA

RESEARCHERS USE ENZYMES TO CREATE SELF-HEALING CONCRETE

WPI researchers are using an enzyme found in red blood cells to create self-healing concrete that is four times more durable than traditional concrete, which could extend the life of concrete-based structures and eliminate the need for expensive repairs or replacements. The work, published in the peer-reviewed journal *Applied Materials Today,* uses an enzyme that automatically reacts with atmospheric carbon dioxide (CO_2) to create calcium carbonate crystals, which mimic concrete in structure, strength, and other properties, and can fill cracks before they cause structural problems.

"The global use of concrete is ubiquitous," says **Nima Rahbar,** associate professor of civil and environmental engineering and lead author. Concrete is the most widely used man-made building material in the world and is a critical component in everything from bridges to high-rise buildings, family homes, sidewalks, and parking garages. But concrete is brittle and prone to cracking from exposure to water, thermal changes, stress, road salt, flaws in design, and other factors that can lead to a loss of structural integrity and the need for costly repairs or replacements.

"If tiny cracks could automatically be repaired when they first start, they won't turn into bigger problems that need repair or replacement. It sounds sci-fi, but it's a real solution to a significant problem in the construction industry," says Rahbar.

Inspired by the process of CO_2 transfer in nature, Rahbar's research, which previously received funding from the Massachusetts Clean Energy Center, uses carbonic anhydrase (CA), an enzyme found in red blood cells that quickly transfers CO_2 from the cells to the blood stream. The CA enzyme, which is added to the concrete powder before it is mixed and poured, acts as a catalyst that causes atmospheric CO_2 to create calcium carbonate crystals, whose matrix is similar to that of concrete. When a small crack forms in the enzymatic concrete, the enzyme inside the concrete connects with CO_2 in the air, triggering the growth of a new matrix that fills in the crack.

The process, which Rahbar has patented, can heal millimeter-scale cracks within 24 hours.

The research paper, titled "An Enzymatic Self-Healing Cementitious Material," was co-authored by Suzanne Scarlata, professor of chemistry and biochemistry; Jessica Rosewitz, former PhD student and now an adjunct instructor of engineering; and PhD student Shuai Wang.

—Sharon Gaudin

INDIAN PANGOLIN OR ANTEATER (MANIS CRASSICAUDATA), ONE OF THE MOST TRAFFICKED/SMUGGLED WILDLIFE SPECIES.

INTERDISCIPLINARY TEAM TACKLES WILDLIFE TRAFFICKING

Researchers Renata Konrad and Kyumin Lee are part of a team that is bringing together law enforcement, scientists, and policy makers to help detect and thwart wildlife trafficking.

Konrad, associate professor in The Business School, and Lee, associate professor in the Department of Computer Science, are co-principal investigators on the 18-month project, which is funded by a $265,998 National Science Foundation planning grant. Principal investigator is Meredith Gore, associate professor in the Department of Geographical Sciences at the University of Maryland, College Park.

Wildlife trafficking involves the illegal capture and trade of protected animals and their byproducts—everything from eels to ivory. It impacts thousands of species and is estimated to generate billions of dollars in revenue annually worldwide.

"Wildlife trafficking is a poorly understood global problem that poses threats to animals, people, ecosystems, and national security," Konrad says. "The goal of this planning grant is to prioritize a research agenda for the nexus of engineering, computer and information science, and the social sciences to deploy their expertise to develop tools that will help law enforcement identify and disrupt trafficking networks."

Both Lee and Konrad have previously focused their research on malicious human activity. Lee has used machine learning and predictive modeling to build algorithms to detect fake product reviews and disinformation online. Konrad, an expert on supply chains, has explored how data analytical tools could be used to disrupt the supply chains that sustain human trafficking.

Wildlife trafficking is particularly difficult to detect and disrupt because it exists alongside legal trade in wild animals and their products. In addition, laws differ from country to country according to species and cultural traditions. In the United States, smuggled wildlife often travels through port or border cities. Criminals work together in physical and virtual networks, sometimes exploiting social media and other online platforms.

The researchers are convening a series of meetings with experts to gather ideas for a future research agenda. An initial meeting with financial service providers, law enforcement, wildlife agencies, and others who are fighting trafficking was held virtually in June.

—Lisa Eckelbecker

PHOTO BY MATTHEW BURGOS

GARCIA NAMED BESWICK PROFESSOR

Rosanna Garcia, an expert on business innovation and marketing, joined the WPI faculty on July 1 as the Paul R. Beswick Professor of Innovation and Entrepreneurship in The Business School.

Garcia, who has a PhD in marketing from the Eli Broad Graduate School of Business at Michigan State University, was most recently the Walter Koch Endowed Chair of Entrepreneurship at the University of Denver; she previously held associate professor positions at North Carolina State University and Northeastern University. Her research on entrepreneurism, innovation, and consumer behavior has been published in peer-reviewed journals; she is the author of the textbook *Creating & Marketing New Products and Services*. She co-founded Vijilent Inc., a data science company that serves the legal industry.

"Dr. Garcia is an accomplished leader who brings exceptional academic credentials, a passion for encouraging minority and female student entrepreneurs, and extensive experience mentoring hundreds of student start-up businesses," says Debora Jackson, dean of The Business School. "She shares our collective vision at WPI for transforming business education and furthering our progress toward making societal impact while also engaging diverse constituencies. We are so excited to welcome her to The Business School and to WPI's thriving innovation and entrepreneurship ecosystem."

The Beswick Professorship was launched in 2007 with a gift from the late **Paul R. Beswick '57** and his wife, Siang Kiang. Beswick was the founder, president, and chief executive officer of Beswick Engineering Inc. in Greenland, N.H.

Garcia earned her MBA in marketing and finance at the University of Rochester, and her BS in chemical engineering and BA in business economics at the University of California, Santa Barbara.

—Colleen Bamford Wamback

QUOTABLE

"Moving forward, we will continue to follow the latest science and learn from our own data, while keeping the health and safety of this community as our North Star. As the pandemic evolves, we learn more every day, and we must adjust our approach as necessary to help protect all members of our campus community while providing the highest quality educational experience for our students."

—President Laurie Leshin in an email announcing all employees who access campus were required to be vaccinated by Oct. 11.

SEEKING GREATER EQUITY IN THE PROMOTION OF IT PROFESSORS

In the United States, only about 20 percent of full professors of information technology (IT) are women. With a $998,053 grant from the National Science Foundation, a team of researchers that includes Elizabeth Long Lingo, assistant professor in The Business School, will explore ways to foster greater equity in the promotion of IT faculty.

The researchers are collaborating with the Association for Information Systems (AIS), an international professional group and a leading organization for IT scholars, to gain additional insight into the role of professional societies and the connections, community, and support they provide, from meeting up with collaborators to developing ties to journal editors and conference organizers.

Long Lingo notes that, in IT, professional associations play a particularly important role for women and underrepresented minorities who want to advance to the rank of full professor. "That's why it is so important to focus on associations and their role in fostering more equitable outcomes," she says.

The researchers plan to analyze and improve the way AIS gathers data about IT professors across the globe, create practices that will support women as they aim to become full professors, and implement practices and training programs that will reduce and address biases within AIS and its members.

"From these insights we can understand how associations can play a role in supporting more inclusive scholarship, foster greater diversity among journal editors and award committee members, and build stronger communities of practice among women and underrepresented minorities," says Long Lingo, a co-principal investigator of the project known as "ImPACT IT: Increasing the Participation and Advancement of Women in Information Technology."

"Coupled with gathering data and creating accountability systems based on that data, we see an opportunity to forge potentially powerful mechanisms for change across the IT field, and STEM academia more broadly."

The grant was awarded under NSF's ADVANCE program, which aims to increase the number of women in science and engineering by encouraging academic institutions, industry, and professional groups to address factors that impact women in their ranks.

—Jessica Grimes

PHOTO BY MATTHEW BURGOS

WPI'S MAESTRO TAKES A FINAL BOW

When **Doug Weeks,** administrator of music and associate head of the Department of Humanities and Arts, joined the WPI faculty part-time in 1980 (he would become just its third full-time music instructor in 1987), the Institute's modest instrumental music program had one performing group: a 15-piece brass ensemble. Today, the university teems with opportunities to not only perform instrumental and choral music, but to study it, to pursue it as a minor or major, to explore it deeply through project work, and to bring it to appreciative audiences around the globe.

"We associate Bill Grogan with the WPI Plan; we associate Doug Weeks with the WPI music program," said Phil Ryan '65, former chairman of the WPI Board of Trustees and former acting president of the university, at a virtual celebration in May to honor Weeks's WPI career. "Both of you have had and will continue to have a very big impact."

The celebration marked Weeks's belated retirement. Having planned to step down at the end of the 2019–20 academic year, he agreed to extend his tenure for another year to help the university prepare to fill his oversized shoes. Little did he know that his final year as a full-time faculty member would be one of the most challenging of his career, as the COVID-19 pandemic made face-to-face instruction and in-person performances before audiences difficult, if not impossible.

"After 40-plus years, I imagine this one stood out," President Laurie Leshin said. "I've been talking at every Commencement ceremony [six were held in June 2021] about how amazing it is that our music and theatre groups figured out how not to be held back by this pandemic, to continue to bring joy to people, and to let people continue to express themselves. They did that with great guides and great teachers, and you are both, Doug."

A running theme during the celebration that one heard from students and alumni who contributed to a 2½-hour video tribute to Weeks (and from noted alumnus Sergio Salvatore '02, acclaimed pianist and senior director of engineering at Vimeo, who appeared by Zoom to perform an original composition called *Although*), is that under Weeks's leadership, WPI has become well known among prospective students who are interested both in music and in studying at a top STEM university.

Weeks, himself, is well known at WPI as the conductor of WPI's Concert Band, Orchestra, and Brass Ensemble and as an educator who developed well-attended courses in American Popular Music, Music Arranging, and Performance and who advised award-winning humanities and arts projects and Major Qualifying Projects. But he also made his mark in the region and around the world as a trombonist who has performed with symphony orchestras, with live theatre groups, and with noted artists like Luciano Pavarotti, Christopher O'Reilly, Henry Mancini, and Leon Fleicher. He is an educator who has served as a guest conductor, clinician, and adjudicator at music festivals; as a mentor, teacher, and performer with students at the Al Kamandjati Music School in Ramallah, Palestine; and as a global ambassador who has taken WPI ensembles on tour in the United States and throughout Europe, Russia, and Egypt.

As the event concluded, Weeks promised that, while his retirement will mark the conclusion of his formal career, there are sure to be many encores in the years ahead as he remains involved with the university and its music scene. One of the first of those may come next spring when the university will hold a special concert to honor Weeks, complete with the debut performance of a new work especially commissioned for the event.

"I want to thank a far-sighted administration, as well as the wonderful students who have incorporated music as part of the Humanities and Arts program at WPI and the WPI Plan," Weeks said at the conclusion of the event. "I walked into a school with a structure in place, and it has been exciting to see it grow and expand. And to see all of these students and alumni here today, some of whom I have not seen in years, is truly overwhelming. I am amazed, and I thank you all so much."

—Michael Dorsey

New Tenure Tracks Recognize and Reward Teaching Excellence

WPI is gaining national recognition for creating new tenure tracks and extended contracts for teaching faculty, a move that recognizes and rewards excellence in teaching. The new policies guarantee academic freedom and participation in faculty governance for full-time faculty members whose primary responsibility is teaching.

The changes give WPI new tools to retain excellent teachers, a shift that will ensure that students receive top-notch instruction, says Provost Winston "Wole" Soboyejo.

"WPI has excellent faculty who have a mission to teach and conduct research, as well as excellent faculty who focus on the teaching mission of WPI," Soboyejo says. "The approach that we are taking will distinguish WPI as a leading university that best balances research with teaching, educating students who are distinctive, while also rewarding faculty who contribute significantly to the preparation of students who are ready to work on day one."

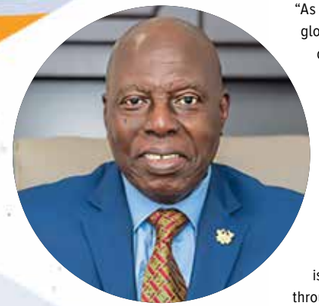
Tenure is an employment category that guarantees professors the right to speak, teach, and research as they wish, and it confers permanent job security. At research universities such as WPI, tenure is traditionally awarded only to faculty members who balance teaching, research, and service, and only after a lengthy review process. While WPI's new tenure path for teaching faculty will be equally rigorous, it will focus on the quality and impact of teaching practice and innovation.

"As an institution that is deeply committed to transforming the lives of our students and to respecting the contributions of all members of our community, I am proud that the trustees, administration, and faculty have collaborated to bring forward this latest innovation in our academic work," says President Laurie Leshin. "Our dedicated teaching faculty will now have a strong voice in institutional governance, and WPI will have a much stronger commitment to their professional growth and careers. I hope we can be a model for other universities in truly valuing the important contributions of teaching faculty."

WPI trustees and faculty approved the new policies in a series of votes over recent months, capping more than three years of study and discussion among faculty members, administration, and trustees. The university expects to identify 45 teaching faculty members over the next three years who will be eligible to pursue tenure; the first group of 15 were identified this summer.

—Lisa Eckelbecker

BARFUOR ADJEI-BARWUAH NAMED FIRST DISTINGUISHED STATESMEN IN RESIDENCE



His Excellency **Barfuor Adjei-Barwuah**, formerly Ghana's ambassador to the United States, is the university's inaugural Distinguished Statesman in Residence.

"As a leader in project-based and purpose-driven global education, research, and outreach, WPI actively builds and sustains partnerships around the world," says Winston "Wole" Soboyejo, senior vice president and provost. "To do that most successfully, we seek out dynamic and prominent leaders whose skills and passions align with ours and who can greatly enhance our efforts and our impact. Barfuor Adjei-Barwuah's influence cannot be understated, and his invaluable insights, understanding of complex issues, and keen ability to build consensus through mentorship of students and faculty alike will greatly enhance WPI's position as a leader and innovator in addressing global challenges."

A native of Ghana, Adjei-Barwuah earned a PhD in geography from Indiana University Bloomington in 1972 and was a lecturer at the University of Ghana. He has served as an advisor to the United Kingdom's Learning and Skills Development Agency as well as Ghana's ambassador to Japan. In 2017 he was appointed by President Nana Akufo-Addo to serve as Ghana's ambassador to the United States.

Adjei-Barwuah will engage with students and faculty through the Social Sciences and Policy Studies Department in the School of Arts & Sciences and will interact with the Institute of Science and Technology for Development (InSTeD) and the Provost's Office. He will also partner with University Advancement to enhance and develop the Provost's Global Initiatives in Sub-Saharan Africa, particularly in Ghana.

—Colleen Bamford Wamback

JOHN A. MCNEILL NAMED BERNARD M. GORDON DEAN OF ENGINEERING

John A. McNeill, PhD, a longtime faculty member in electrical and computer engineering whose excellence in teaching has been recognized numerous times, has been named the Bernard M. Gordon Dean of Engineering. McNeill, who joined WPI in 1994, began his career working for Bernard Gordon, an inventor, entrepreneur, philanthropist, and former member of the WPI Board of Trustees. McNeill has been serving as the interim dean since September 2018.

"John McNeill is a dynamic educator and a respected leader, attuned to what both industry and the world need—namely, globally focused and creative problem solvers from across disciplines who will work together to make the world and people's lives better in tangible ways," says Provost Winston "Wole" Soboyejo. "This is challenging and meaningful work that requires hands-on leadership, creativity, collaboration, mutual respect, and endurance. John delights in teaching, and he inspires that same joy and excellence in others."

While WPI has been well known for its engineering excellence since its founding, the School of Engineering was established just 11 years ago and is now one of four schools—including the School of Art & Sciences, The Business School, and The Global School. Each school embraces and extends the university's half-century of leadership in global project-based education and its dynamic research ecosystem that draws steadily increasing levels of funding and works with a diverse array of partners to understand and solve the world's technological and societal problems.

"I didn't think it was possible to have a better job than that of professor, but serving as WPI's Gordon Dean of Engineering is the opportunity of a lifetime, especially because it brings my career full circle," says McNeill. "Bernie Gordon was an important influence who taught me that being an engineer meant working for the benefit of people—and that my work as an engineer needed other people's talents and commitment in order to have the most value. He helped me understand the importance of collaboration and mutual respect for true success."

—Colleen Bamford Wamback

BUILDING A MARKETPLACE FOR COLLEGE ARTISTS

Matteo Cugno '22 enjoys the creative thrill of building something from scratch. As a kid, that meant building giant snow forts in his front yard, intricate designs with his Lego collection, or new worlds in Minecraft. When considering an academic direction at WPI, mechanical engineering seemed the logical choice.

But lately, Cugno has discovered a passion for building something entirely different—as an entrepreneur. He partnered with his best friend, Josh Kim, to cofound The Cubby, an art marketplace for college students to sell and showcase their work to the public. Their mission is to empower college creatives by allowing students to retain 100% of their listing price, unlike other existing marketplaces such as Etsy, Society6, or Redbubble.

"The Cubby is built by college students for college students," says Cugno, who serves as the start-up's chief operating officer. "We want college creatives to be able to support themselves through their artwork, whether they are fine arts majors, or someone in STEM whose passion is to create."

Artists work with a third-party vendor that provides shipping labels through the site, making the transaction process as smooth as possible. "We also focus on marketing the artist as a student, rather than just the product they're selling," he says. Each profile includes a personal bio, a portrait, the name of the school the artist is attending, and artistic and college career goals. "We want buyers to know their purchase has a real impact on that student's college career."

Since February 2021, The Cubby has attracted more than 500 student artists from 37 schools across the country—with 3,000 monthly users.

The Cubby began as a campus marketplace for college students where they could sell each other items such as textbooks, dorm appliances, or other college-related essentials. Kim launched the small venture—originally called Sklaza—from his residence hall at Colby College in Maine, and experienced modest success up until March 2020. During the pandemic-forced isolation, Cugno and Kim joined forces to explore whether the business was realistic as a going concern.

"That summer, internships were closed and there was no work, so we said, 'We're going to dive headfirst into this and see where we can take it,'" he says. They rebranded their venture, and when the fall 2020 semester began, launched The Cubby at five colleges: Colby, Northeastern, University of Maine, Boston College, and WPI.

Although the pandemic kept many college campuses empty, and users were wary about meeting in person, they noted one category of items for sale was very popular: student-made items.

"We thought, we have something here that we should look into, because we're solving a real problem now," says Cugno. They spent winter break conducting customer discovery interviews and market research, speaking with a hundred potential buyers and sellers, and pivoted the site again to become art focused.

Since relaunching in February 2021, The Cubby's main source of income has been grants and prize money from business plan pitch competitions, including a $25,000 grant from the Maine Technology Institute.

Because the site does not charge users, the team needed to figure out a different kind of revenue model. The conclusion was that The Cubby community itself has value. "As our generation gets older, we're the next biggest consumer in the U.S. economy. Companies don't really know how to market to us. Our users know what's cool, what's trendy, and their creative nature is valuable to brands and businesses who are looking to grow rapidly," he says.

The start-up is also gaining attention as it begins to enter the growing crypto currency space of non-fungible tokens (NFTs)—digital assets that can be recorded in a database and purchased or traded from person to person. With the future of art now shifting to a more digital medium, The Cubby plans to encourage college creators who make digital art to explore this new space.

"Our motto is to focus on the next small win that puts us in a greater position for success: Small wins add up," Cugno says.

—Kristen O'Reilly

IN SIDER

MATTEO CUGNO '22

PHOTO BY MATTHEW BURGOS

PROJECTS

See how WPI students put theory into practice through projects.

Developing a Holistic Approach to Fighting Food Insecurity

THE STUDENTS

Rachel Feldman '23, Mia Long '23, and **Lydia Ellen Tonani '23**

ADVISOR

Laura Roberts, director of the Worcester Community Project Center and an instructor in WPI's Department of Integrative & Global Studies

THE BACKGROUND

According to data from the organization Feeding America, Massachusetts has seen a 59 percent increase in food insecurity during the COVID-19 pandemic. Those with food sensitivities and allergies have a difficult time finding food from nonprofit and government food programs. Feldman, Long, and Tonani worked with Thrive Support & Advocacy, an organization that serves youths and adults with intellectual and developmental disabilities and their families across Central Massachusetts. Thrive was recently selected by the Massachusetts Department of Developmental Services to manage the Worcester-area Family Support Center and work with more than 600 new families in Worcester and seven surrounding communities.

THE CHALLENGE:

Create a food pantry that takes into account not only hunger and food insecurity in the area, but also the best possible diet for different populations—including those with food allergies and dietary restrictions—while also respecting ethnic and cultural cuisines.

THE SOLUTION:

The Interactive Qualifying Project team focused on finding sources and suppliers of foods that are safe for Thrive's clientele. Thrive is partnering with WPI for the initial build-out of the space as well as ongoing support from WPI students to volunteer at the food pantry.

Tonani used demographic data to assess nutritional and accessibility needs in the area and how to best accommodate people's cultural and ethnic backgrounds as well as any dietary needs and food sensitivities. Feldman learned how to measure and design a site to be ADA compliant within the sponsor's budget. She reached out to other local food pantries about their operating procedures as well as supermarkets to ask about donations. Long researched sensory rooms and their importance to individuals living with developmental disabilities.

SUBMITTED DELIVERABLES:

Projects included a blueprint for the space, budget, inventory plan, and identification of partnerships for volunteers and food sources.

PHOTO BY MATTHEW BURGOS

Tim Loew is executive director of Massachusetts Digital Games Institute, or MassDigi, which joined WPI earlier this year. Since its founding in 2011, MassDigi has collaborated on the launch of more than 30 games and provides a supportive, well-connected environment for students to gain invaluable experience, network with professionals in the video game industry, explore game development jobs, and build and hone their skills.

What is your role at WPI?

A decade ago, when MassDigi first got going, our role was to foster entrepreneurship, academic cooperation, and economic development across the state's games ecosystem. Since that time, our efforts have primarily focused on collaborating with students and faculty, start-ups, and established studios in Massachusetts to support the sector and its success.

At WPI, given the institution's tremendous capacity, we expect our role to grow in both scope and scale, allowing us to collaborate more deeply not only throughout New England, but across the country and around the world, particularly in areas beyond entertainment such as health care, education, and training.

Why do you think MassDigi and WPI are such a good match?

We could not have been more fortunate than to have found a new home at WPI. Between WPI's highly regarded interactive media and game development program and its commitment to innovation and entrepreneurship, we're a great combination. The global games market continues to grow exponentially.

How is MassDigi positioned to lead the way and meet the demands of this fast-moving industry?

The cultural, technological, and economic impact of games is really quite amazing. More people in more places connect through play—be it online or across a table—than through nearly any other shared human experience. As sprawling as games are, and as fast-moving as the game industry is, we feel that, given the quality and range of our relationships, we are always on top of key trends, changes, and advances.

What do you enjoy most about your role?

As executive director, the best part of my day comes when I have the chance to see and hear about what students are thinking about and working on. The vibrancy and energy that come from being around young people on their way up are unbeatable.

What is your vision for MassDigi?

The game development process is an iterative one and we have used that same approach when shaping our vision. We are always looking to learn and improve, and our vision will always reflect that dynamism. That said, one thing is for sure, being at WPI means our future is brighter than ever.

—Jessica Grimes

ILLUSTRATION BY JONATHAN REINFURT

GLOBAL IMPACT

IN-PERSON PROJECTS RETURN TO ACADIA NATIONAL PARK

Back in grade school, some teachers would start off the academic year with a writing prompt, asking students what they did during their summer vacations. While WPI students have long since wrapped up their grade school careers, the ones who spent their summers at the Acadia National Park Project Center to complete their Interactive Qualifying Projects (IQPs) would have quite the stories to tell—and not just about their completed project work.

"We were the first group to go back to in-person work since the pandemic began," says Project Center Director and Professor of Music Frederick Bianchi, who cites being able to meet and work with his students in person as the highlight of this year's trip. "It was great to just see the students arrive, and to see them in person for the first time in this environment that was so great … all of us being there together was just perfect."

And really, there's no place better than Acadia for long-awaited reunions and picturesque scenes. Its stunning views and myriad outdoor activities make it a popular tourist destination—so popular that much of the students' project work focused on addressing preservation, improvement, appreciation, and sustainability of the natural environment, as well as issues affecting the visitor experience.

"The universal problem is that there are so many visitors," Bianchi explains. "That translates to not only traffic problems but the visitor experience. It all trickles down; there's resource depletion, pollution, noise … there are so many issues underneath that one umbrella, and endless opportunities for WPI to engage in important work."

The reasons students choose to travel to the Acadia National Park Project Center are as varied as the projects themselves. Some, such as James Van Milligen '23, were drawn to the project center by their love of the outdoors, while Navelyn Carrillo '23 had never been to a national park before and was eager to spend her summer at one. Bryce Bragdon '23 and Donovan Shaw '23 are both native Mainers who wanted to get a different perspective on the park itself.

"I've lived in Maine my whole life and had only really been to the park once," Bragdon says. "This was a great opportunity to help out something in my home state and experience it from a whole new perspective."

Many of the projects are also years in the making: Bragdon and Carrillo were part of the Trail View Hiking project, which focused on documenting all the trails in the park with panoramic photos and informational sidebars to create immersive, 360-degree virtual tours for park visitors and cyber tourists. The project originally began in 2012 and has been built upon by subsequent teams ever since. Other multi-year projects include tracking light pollution through the Dark Sky project, and tracking and monitoring visitor traffic behavior. It all makes for the ultimate project experience as they collaborate with each other, as well as with students of years past.

This year, the project center saw not only the return of in-person project work, but a new partnership with StreetLight Data, a big-data transportation company based in San Francisco. Access to StreetLight Data allowed many of the WPI teams to achieve in a single term what has taken past teams several years to achieve. Van Milligen and his team used this data to develop strategies to help reduce traffic congestion in the park.

"There was no better feeling than actually being in the park collecting data," Van Milligen says. "One of the rangers actually came up after [our presentation] and had a conversation with us on one of our methods."

While the excitement of in-person projects was palpable, there was still the uncertainty of whether anyone would be able to see the students' final presentations. Bianchi prepared his students for the possibility that, because things were not quite back to normal, the presentations might be sparsely attended. However, their anxieties dissipated when the park's superintendent and entire leadership team walked through the door to see the students and commend them for their work.

"We held up our end of the bargain," Bianchi says. "We did all the research, and we were well-prepared. We kept our fingers crossed, and it all ended up being perfect."

—Allison Racicot

ACCESS EXCLUSIVE DIGITAL CONTENT—INCLUDING PHOTO GALLERIES OF STUDENTS IN ACTION—AND LEARN MORE ABOUT WPI'S WORK IN ACADIA NATIONAL PARK AT *WPI.EDU/+ACADIAJOURNAL*.

PHOTOS WPI ARCHIVES

THE ARCHIVIST

George Rockwood, Class of 1888: A Pioneer of Automatic Sprinklers Saved Countless Lives

When it was acquired by Gamewell Company in 1930, the Rockwood Sprinkler Company of Worcester employed more than 325 individuals with annual sales of $1.5 million (about $25 million in today's dollars) as it dominated the automatic sprinkler market throughout the Northeast and Canada.

Located in the industrial heart of Worcester, the company was responsible for saving countless mill and factory workers during an era of rapid industrialization. Its founder, George Ichabod Rockwood, graduated from WPI in 1888 with a degree in mechanical engineering. He was first employed as a draughtsman at the Wheelock Engine Company before beginning work as an independent mill engineer in 1893. By 1905, he had patented an automatic fire-suppression system he named the Rockwood Sprinkler System.

In 1906, his factory opened on Harlow Street and began to supply life-saving equipment to the many industrial interests of the region. The Rockwood Sprinkler System was designed to automatically begin feeding overhead water to a space whenever a fire developed past a certain temperature.

In World War II, **Howard Freeman '40** developed the "Waterfog" nozzle at the request of the U.S. Navy during World War II while he was employed at Rockwood Sprinkler Company. Freeman's design, combined with Rockwood's means of production, is credited with saving the lives of thousands of sailors during World War II and afterward as the nozzles became standard issue on many ocean vessels.

To learn more about WPI's history of innovative and pioneering work in Fire Protection Engineering, visit "Foundations of Fire Protection Engineering" at Digital.WPI.edu or WPI Archives & Special Collections.

—University Archivist Arthur Carlson,
assistant director of George C. Gordon Library

CLOCKWISE FROM TOP: GEORGE ROCKWELL, CLASS OF 1888; HOWARD FREEMAN '40; THE WATERFOG NOZZLE, DESIGNED BY FREEMAN AT ROCKWOOD SPRINKLER; AN ADVERTISEMENT FOR ROCKWOOD SPRINKLER COMPANY.

GLOBAL CITIZENSHIP EDUCATION
I am proud to have a chapter in this book featuring undergraduate critical service-learning. Our team worked hard to build a reciprocal, transformative relationship with our refugee resettlement community partner. It showed what happens when you put stakeholders at the center of a truly collaborative partnership.

THE LORAX
The Lorax was a transformative book for me. It was the first real recognition I had of the danger of waste and greed but, more important, a strong lesson in stewardship and one person's capacity to make change.

BOB ROSS PEZ DISPENSER
We were heading to Berlin for an Interactive Qualifying Project in early March 2020 but COVID had other plans. We were concerned about losing the cohort bonding and sense of community, but fun events like a "Bob Ross Virtual Paint Night" helped us connect and bond.

PHOTO BY MATTHEW BURGOS

DECK OF CARDS
I am part of a research collective called Assessing the Practices of Public Scholarship that focuses on re-imagining assessment as a more generative, inclusive, and authentic practice. This set of cards was a playful and fun representation of the history of Imagining America—an organization dedicated to civic life, art, and social justice.

QUSQU THE ALPACA
This little guy, Qusqu, came from a trip I led a few years ago with 21 students as part of a specialized backpack program to develop global citizenship identity. Traveling with students with the aim of meaningful learning and identity development is what brought me to WPI.

UNITED NATIONS
I can trace the UN part of my life back to a 4th grade field trip that captured my imagination for what international collaboration could be. I've had the good fortune to work in that space in a variety of ways over the years. Prior to my doctoral work, I was a research associate for former US Ambassador to the UN Samantha Power. I have presented about my research on refugee issues and women's human rights, as well as my work on online, open-educational resources for UN Women.

PHOTO BY TODD VERLANDER

FACULTY SNAPSHOT

Sarah Stanlick

ASSISTANT PROFESSOR,
DEPARTMENT OF INTEGRATIVE AND GLOBAL STUDIES
DIRECTOR, GREAT PROBLEMS SEMINAR

SENSE OF PLACE

BACK IN ACTION

After a year of pandemic-induced silence, Alumni Stadium awakened with a roar of activity this fall, a sure sign that campus life was returning to something close to normal. Varsity athletes dusted off the rust and jumped into a full schedule, buoyed by the supportive cheers of the home crowd. Find out how your favorite team fared by visiting *athletics.wpi.edu*.

PHOTO BY MATTHEW BURGOS

CHARTING THE UNKNOWN

FOR A BETTER FUTURE

Manasi Vartak's start-up helps companies build AI-enabled products faster than ever.

By Julia Quinn-Szcesuil
Photograhy by Jim Gensheimer

M

Manasi Vartak '10 doesn't shy away from the unknown. Now CEO and founder of AI start-up Verta, she came to WPI intent on discovery. With the drive to study the science and math she loves and the fearlessness needed to relocate her life from India to New England, Vartak knew her bold approach was necessary to have a big impact on the world.

As a high school student in Pune, India, Vartak knew pursuing her education overseas would allow her a particular freedom she craved. "If you go to college in India, there are more rigid disciplines," she says. "If you are going to be an engineer, you study only engineering. If you want to go into biology, you study only biology or math. That's fine if you want to specialize in only one thing, but I had interests in a lot of areas. To put them into buckets seemed very limiting. I wanted to be able to connect dots between disciplines, and be able to shape my own path."

Always a builder, Vartak wanted an engineering college and a technical school so WPI made her first cut. But the university's distinctive project-based learning approach especially intrigued her, she says. "I appreciated WPI's hands-on nature," she says. "I appreciated the IQP (Interactive Qualifying Project), the MQP (Major Qualifying Project). I wanted a place that was hands-on and where I had the freedom to explore. It taught me to stay interested, engaged, and constantly continue to learn."

LEARNING CURVE

Vartak first saw the WPI campus in person when she arrived for New Student Orientation in 2006. Coming from a city of about 7 million people to Worcester was a big transition. Meeting students from all over the globe, and even those from different cultures and traditions within the United States, taught her to consider new, unfamiliar perspectives, an important skill for any modern business leader. She dove in to explore everything—academics, social life, and extracurricular activities.

"College makes you who you are as a person," she says. "It teaches you grit and how to work through challenges because you are on your own. For me, WPI was all that. I learned a ton. I did so much, and my four years there were a blur. It was a really good experience for me."

Vartak says she's grateful to the alumni who paved the way and created generous scholarships that sealed her decision. "They made it possible for me to come to WPI," she says. "I am extremely grateful for them and the school as a whole."

As with all WPI students, humanities and the arts were part of Vartak's foundation. "WPI really focuses on rounding you out as an individual. I got to take art classes, which, even though they don't have anything to do with AI or machine learning, were really important because they helped shape who I became and how I look at the world." she says. "And my writing classes especially have served me really well. As an entrepreneur and business leader, your communication skills have to be razor sharp. WPI helped give me that."

FINDING HER FOOTING

And the freedom she so craved? At WPI, it actually changed the course of her studies. "I don't think I ever would have imagined studying computer science. Initially, I think physics was my intended major." she says.

But a Scheme course and then one on Java helped her envision the enabling power of technology, and that opened up possibilities she had never considered. "I could work in a variety of disciplines and on a variety of problems and make an impact that was pretty wide," she says. "I came to see computer science as a powerful tool to innovate and build with, and I gravitated toward that."

Vartak credits Elke Rundensteiner, professor of computer science and founding director of the Data Science Program, with giving her the motivation and inspiration to take the direction she did. "She is the reason I even pursued a PhD," says Vartak. "I got started in databases in her lab." As a formative mentor, Rundensteiner introduced Vartak to research opportunities that were intellectually exciting.

Close collaboration with Rundensteiner allowed Vartak to dive headlong into her newfound love of computer science. "At WPI, I got to explore a ton of things and see

what resonated," she says. "Sometimes the larger schools don't let you do that. I had access to faculty and had opportunities I might not have had at larger schools."

She says Rundensteiner's ability to inspire her students by modeling curiosity and tenacity was, and remains, impressive. "She is amazing," says Vartak. "She's encouraging and will push you to do better. It's a delicate balance. She assigns problems that are a good fit for the student but outside their reach. She makes sure you work with good grad students and have a good support system."

Vartak's computer science degree and her love of data shaped her journey and led her to a PhD program at MIT, where the seeds of Verta were planted. As she progressed through professional roles at tech giants including Twitter, Google, and Facebook, she developed as a leader. But the love of discovery and exploration cultivated at WPI continued to mature in her.

CREATING A VALUABLE PRODUCT

In 2018, Vartak decided to capitalize on her years of experience and exploration and launch Verta, a new kind of platform that enables businesses who see value in data and AI to push boundaries. Just two years later, Verta secured a $10 million Series A round of funding from investors, a sign of the company's potential.

She describes Verta as the first system of its kind, a solution to the decades-old divide between research and creating a product from that research. In concept, it is similar to a pharmaceutical process, she says, where scientists might find a useful chemical compound for a drug, but then it needs to become a useful, consumer-friendly product.

Data scientists and machine learning teams often struggle with similar issues. "A lot of data science is building something that is one-off," she says. "Data scientists experiment a lot to arrive at algorithms—or models—that offer accurate, useful insights. Once you have a useful model, you have to figure out how to move the model into production—how do you scale it up, optimize it, and make it robust? The process is very different from what is required to build the models in the first place."

Before Verta, the process left a gaping hole between current research findings and old data. AI is only as good as your data, says Vartak, so she wanted to match the most current data with ever-evolving models.

"And we also want to enable teams to evaluate how well a model is performing in the real world and relay that back to the researcher," she says. "Ideally, you create a loop of information that links real-time results to the model the data scientists developed. If I have a great idea, I want to instantaneously be able to deploy it, and then learn from those relays and signals in order to improve models immediately."

> "Start-ups are full of uncertainty. They are roller coasters. Every day is a new challenge, but every day is a new opportunity."

As she approached the beginnings of an innovative path, Vartak says she knew she had the determination and the skillset to deliver something no one else ever had. WPI projects, including work on ASSISTments with Neil Heffernan, director of the Learning Sciences & Technologies Program, taught her how to work fast and to experiment quickly, even with limited resources and impossible deadlines.

As with any kind of experimental journey, iteration is essential to success. "In today's business context, market dynamics move extremely quickly—and machine learning models need to be able to keep up with data patterns. So if you can speed up the time it takes to go from experimentation to the next iteration, you can increase the speed of innovation."

But as a new discipline, best practices for operationalizing machine learning are still being established. Vartak created Verta to help streamline these processes, allowing businesses across industries to extract more value from their data.

The uncertainty of starting a company from nothing is invigorating to Vartak. "Start-ups are full of uncertainty," she says. "They are roller coasters. Every day is a new challenge, but every day is a new opportunity. You work very hard and if you do everything right, you'll have a successful business."

Vartak says learning from mistakes is how start-ups—and start-up leaders—become better. "You can fail and when you fail, you can get over it and can pick yourself up and keep going," she says. "All the small experiences you have along the way help you accomplish big things."

Being able to understand the customer's need is essential. "There's such a big gap between 'I have an idea' or 'I have a solution' and 'I am going to build it and deliver it and make sure it works for the customer,'" she says. "I've come to appreciate what it takes to build a world-class product. That's the trial and error and the unique path to a start-up."

As Vartak continued with her intense doctoral path and the launch of Verta, she kept Rundensteiner's example in mind. "She's an exceptional researcher and has a great family," she says. "She has a good sense of humor and is a well-rounded individual. With a young family myself, I am realizing the constant trade-off and am appreciating women like her even more."

She also realizes the need for role models. "There are few tech women leading companies, and it's not for lack of talent," Vartak says. "There are a lot of reasons why I started Verta. But one of them was to show other women, 'This is a possible career path for you, and you can do it well.'"

Those experiences have even shaped how Vartak runs Verta. Knowing she doesn't mirror many traditional ideas of tech startup leaders, she is consciously developing a diverse team at the software company. Representation of different experiences, backgrounds, ages, and genders, to name a few, matters to retention, to job satisfaction, and to a global workforce.

A DATA-BASED FUTURE

"At every stage, the challenges are different," she says. "Building something like Verta takes effort, patience, and perseverance, and I learned a lot of those at WPI. Professional satisfaction depends on being able to identify the problems you care about solving. That's what make work fun, and that has to be the subtext."

For Vartak, enabling the businesses to unlock more value from AI is a fun challenge. "I firmly believe the next wave of software is intelligent software," she says. "Many businesses are only beginning to realize the real power of data and predictive technologies."

Verta stands on that cusp, and Vartak is comfortable at the forefront of tomorrow's possibilities.

"I want to enable that intelligent software. Even when I was at WPI, enabling technology was a theme that resonated with me," she says. "It all goes back to innovation. There are so many new and open problems in the space and there's a lot of room for innovation that's going to have a pretty sizeable impact. So this is where I want to spend my time exploring."

PHOTO BY ROBERT FALCETTI

SPACE DREAM REALIZED

CLASS OF 2003 FRIENDS RYAN MCDEVITT AND MATT SHEA GROW A SATELLITE PROPULSION BUSINESS FROM SEEDS PLANTED 20 YEARS AGO.

By Allison Racicot
Photograhy by Danielle Allendorf

THE COLLEGE ESSAY. IT'S A PLACE FOR TEENAGERS TO LAY IT ALL ON THE LINE, TO SHARE PASSIONS, ACHIEVEMENTS, AND GOALS FOR THE FUTURE, IN 500 WORDS OR LESS. WHILE SOME COLLEGE HOPEFULS MAY HAVE TROUBLE SUMMARIZING THEMSELVES IN JUST A FEW PARAGRAPHS, OTHERS CAN SUM UP THEIR GOALS IN A SINGLE SENTENCE. FOR MATT SHEA '03, IT WAS THE LATTER. WHEN HE APPLIED TO WPI BACK IN 1999, THE CONTENT OF HIS ESSAY WAS SIMPLE:

HE WANTED TO SEND SOMETHING INTO SPACE.

"WORKING FOR A COMPANY THAT BUILT SPACE-BOUND VEHICLES, WORKING ON ANYTHING THAT GOES INTO SPACE," HE RECALLS. "ANYTHING LIKE THAT; I JUST WANTED TO BE A PART OF IT."

AND NOW, THE HOPES SHEA WROTE ABOUT IN HIS APPLICATION ESSAY OVER 20 YEARS AGO HAVE BECOME REALITY. AFTER BEING PITCHED AN IDEA FOR A COMPANY BY LONGTIME FRIEND RYAN MCDEVITT '03, THE TWO JOINED FORCES IN 2017 TO START BENCHMARK SPACE SYSTEMS, WHICH BUILDS PROPULSION SYSTEMS FOR SATELLITES. JUST A FEW YEARS AFTER THE COMPANY'S INCEPTION, THREE SATELLITES THAT BLASTED OFF IN SPACEX'S FALCON 9 ROCKET IN JUNE 2021 INCLUDED PROPULSION SYSTEMS CREATED BY BENCHMARK.

TALK ABOUT ONE GIANT LEAP FOR MANKIND.

"OH, WE COULD BUILD THIS."

Getting a satellite into space is one thing. But those satellites also need to be able to move and get around. That's where Benchmark comes in. The company builds propulsion systems for satellites that range in size from those you can hold in the palm of your hand to some that are as big as a refrigerator.

For a company dealing with tasks and creating solutions simultaneously large in scope and intricate in detail, its origin story is surprisingly simple: a meal with a friend.

While finishing his PhD in micro-propulsion at the University of Vermont (UVM), McDevitt headed down to Florida to visit Shea, who was working as a product engineer at Draper Labs. They began discussing some of the technology that would be coming out of McDevitt's PhD program, and after a quick sketch and some calculations from Shea, they experienced a straightforward revelation: "Oh, we could build this."

That set their very own extraterrestrial Field of Dreams into motion. Not only could they build it, but if successful, their product would be cheaper than anything on the market at the time. The technology and enthusiasm were there; it was just a matter of making their plans a reality.

"That was the genesis of it," McDevitt explains. "We had some more conversations and it was organic, the way things came about. I convinced [Shea] to come work with me to get things started … once he knew it was possible, I think it was hard for him not to do it."

Shea agrees with a laugh, adding, "He came in at the right moment in time. It was a good idea, and he convinced me."

There's an easy rapport between McDevitt and Shea (who serve as co-founders and CEO and COO of Benchmark, respectively), one that's clearly been cemented over decades of friendship built on sharing a passion for space and a residence hall.

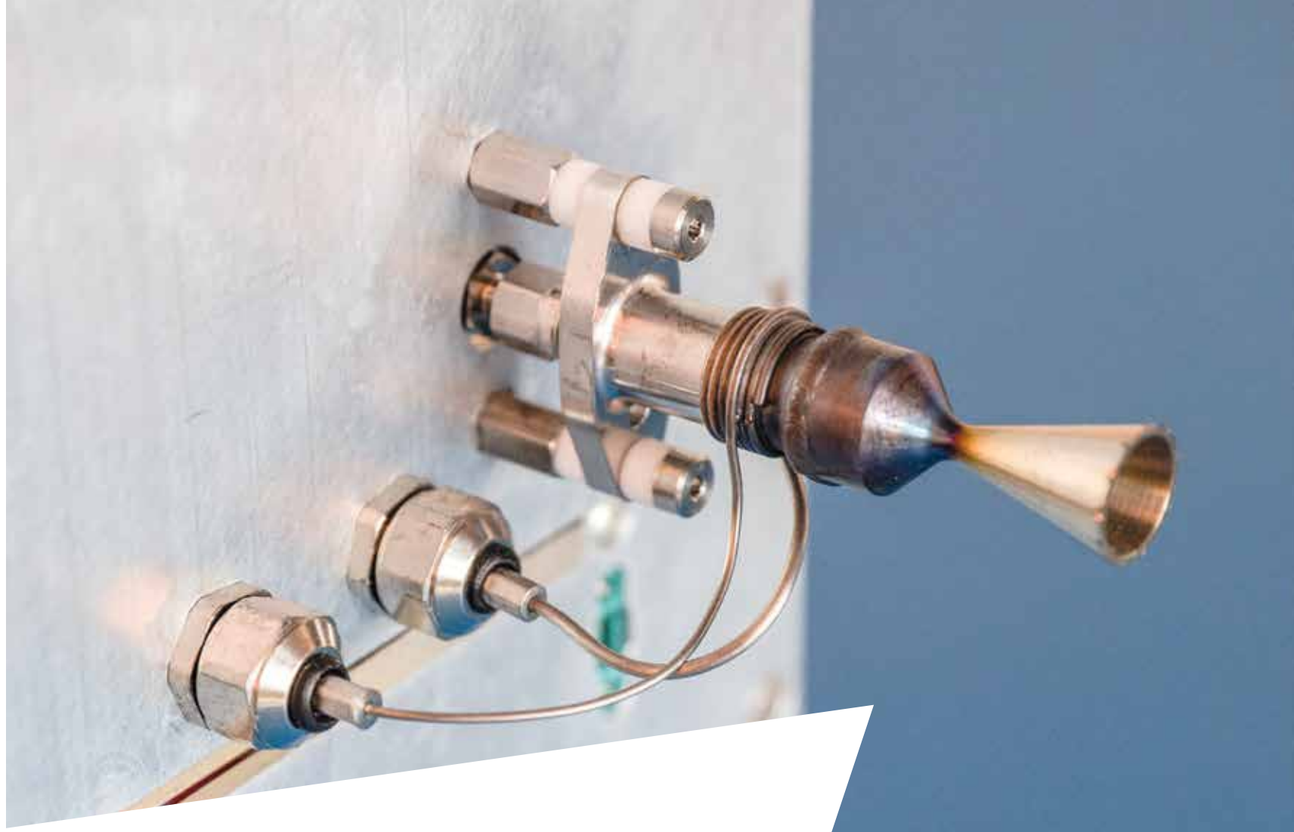
"We both lived in Institute Hall, and were in the same orientation group," McDevitt says. "It was a great opportunity for us to get to know each other. We've been close since day one, lived together sophomore year, hung out all throughout college."

The two majored in mechanical engineering with a concentration in aerospace engineering ("Aerospace wasn't added as a major until the year after we left," Shea laments with a laugh), and also shared the same mentor during their time at WPI, John Blandino, associate professor of aerospace engineering.

Working on his Major Qualifying Project with Blandino, Shea contributed to a piece of test apparatus for the LISA Pathfinder mission. "It was his coaching that opened my mind to the possibility of working on this," he explains. "Just being associated with the project played a big part in what I thought was achievable in the future."

McDevitt's experience with the professor was twofold: He'd worked on a thruster project with Blandino the summer between his junior and senior years, producing a paper that not only landed them a slot at a grand propulsion conference, but helped McDevitt get into UVM. Blandino also taught what ended up being McDevitt's favorite class in college, one focused on space systems. The class proved so influential that when McDevitt was lecturing at UVM as he wrapped up his PhD, he modeled his space systems class on the one he'd taken from Blandino back in 2003.

"You can draw a direct line from the work I did with him to what we have now," McDevitt says. "He may not even realize how much impact he had on Benchmark's becoming a company. It really, truly wouldn't exist without the work and support he gave us."

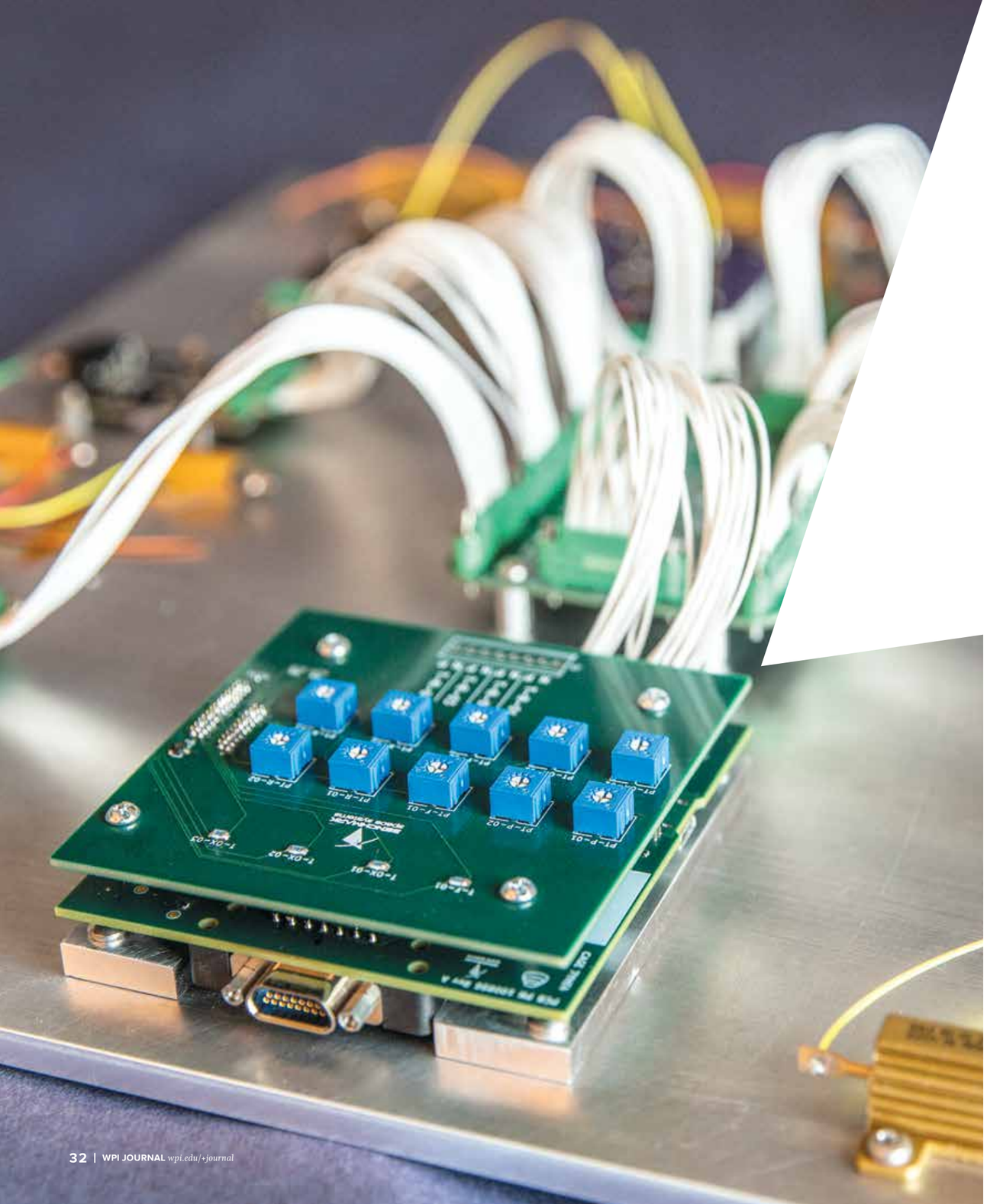


"HE [JOHN BLANDINO] MAY NOT EVEN REALIZE HOW MUCH IMPACT HE HAD ON BENCHMARK'S BECOMING A COMPANY. IT REALLY, TRULY WOULDN'T EXIST WITHOUT THE WORK AND SUPPORT HE GAVE US."

A ROLLERCOASTER OF EMOTIONS

Building a company from scratch and keeping things running smoothly are impressive achievements in and of themselves. Now, McDevitt and Shea have one more to add to the list: "flight heritage," or proof that a product can work in space.

Contributing their propulsion systems to the SpaceX mission gave Benchmark the chance to achieve exactly that. Despite the anxieties that come with sending work into space for the first time—as well as an initial launch date in January 2021 that got pushed back until June—McDevitt and Shea were feeling confident that this time the launch would occur, taking their technology into space with it.



BENCHMARK COO MATT SHEA '03, LEFT, AND CEO RYAN MCDEVITT '03

"We built these systems and shipped them back in 2020," says McDevitt, who hosted their launch party at the company's headquarters in Vermont. "We'd been waiting a long time, and we were excited to finally be able to get them up there."

While McDevitt held down the fort at Benchmark, Shea was at the launch facility in Florida, where the atmosphere was buzzing with energy, including a tourist sightseeing helicopter that Shea noticed hovering almost directly overhead. The excitement was palpable—in mere seconds, their work was finally going to be sent into space.

Or so they thought.

"The countdown's going, cameras are ready, we're watching. It goes down to 11 seconds, and then it just stops," Shea says. He explains that the crew used the phrase "The range has been fouled" as the reason for the stoppage, meaning that something came into the safety space around the launch rocket by sea, land, or air.

Suddenly, the helicopter from earlier made a lot more sense to them.

"As soon as we heard the news on the broadcast, that helicopter above us totally booked it out of there," Shea remembers with a laugh, and while they never knew for sure whether the helicopter was the culprit of the delayed launch, it made for an entertaining story amidst the disappointment felt by the Benchmark crew as they were forced to postpone their celebrations once again.

A day later, on June 30, they finally saw three of Benchmark's propulsion systems enter space. "It was spectacular," Shea says. "We've all seen launch videos on YouTube, but seeing it in person—with *your* tech on it—was totally different."

"They're up there and safe, everything's working and looking good," McDevitt adds. "It's exciting … we couldn't have asked for better."

THE FINAL NEXT FRONTIER

The camaraderie and support McDevitt and Shea show isn't limited to each other. They've been working hard to ensure the right people are in place to help them continue growing the company that began as nothing more than a visit to catch up with a friend.

While they still love being able to explore the technology surrounding their work ("Deep down, we're still engineers, so it's fun to take a dive into new data, new rocket stuff. It's really, really cool," Shea says.), they both agree that their favorite parts of their jobs involve witnessing the success of those with whom they work.

"This is a challenging environment," McDevitt says, "and having people come in at all stages of their careers and watching them learn, grow, and put their stamp on what we do and help guide the company in different ways, that's the best. We're hearing different voices, learning from each other—that's what I get most excited about."

McDevitt, Shea, and their team are in a prime position to keep things going and build upon what they've already achieved, with goals that include expanding their workforce, their footprint within the Department of Defense, and what they offer customers.

"We want to be able to help earlier in the process," McDevitt says, explaining that they're aiming to help those interested in using their technology think about mission planning, how to source different components, and how to operate in space, as opposed to simply sending along their hardware and moving on. "Our goal is to be a more full-service partner for them."

While they've got plans about where they hope to take Benchmark next, one of the things they both took away from their time at WPI was the notion of flexibility and the willingness to pivot as needed—to know that while it's good to have an idea of where you want to go, you don't have to know exactly how everything is going to play out in the end.

"You just don't," McDevitt says. "There are so many opportunities, especially coming out of a place like WPI. My life took all sorts of twists and turns. I didn't have a traditional career path in engineering, and that's fine. I think I'm better for it."

Shea agrees, citing the fact that after he graduated, his first job was as a technician, not an engineer, something that had him lamenting why he went to college in the first place. "As it turned out, it was one of the greatest jobs I could have taken. What I learned has continued to play an important role in the rest of my career."

That's not all that's followed them from their time at WPI—there's also the time management skills. "The speed at which everything happens at WPI has had a big impact on how I process and complete my work, and how I see the potential for what can happen in a short amount of time," McDevitt explains.

And the project work experiences: "Problem statements, literature reviews, research, coming up with a hypothesis and testing it out … everything we did during IQP and MQP, we do at work every day," Shea says.

"So much of Benchmark is formed by our different experiences," McDevitt says. "It's not lost on us that all of this, where we are today, is due to the seeds that were planted 20 years ago."

STIMULATING INNOVATION

WPI's entrepreneurial ecosystem builds an essential mindset for problem solvers.

By Kristen O'Reilly
Illustrations by Hugo Herrera

Tune into the entrepreneurial subculture at WPI and you'll discover innovators with a bevy of ideas focused on solving real problems. Some aim to commercialize their ideas, others to refine a research technique, develop an academic project, or find new approaches to address social justice causes.

"We're helping all innovators, not just those who are looking to start a business with their ideas," says Curtis Abel, executive director ad interim of the Innovation and Entrepreneurship (I&E) Center. "Our vision is to inspire and develop a community of impact makers to spearhead life-changing ideas for the greater good. Whether it's for a school project, a hobby, a business venture, a nonprofit, or research in the lab, we provide programs, experiences, mentorships, and resources."

First and foremost, Abel notes, WPI focuses on developing people who thrive in a culture that stimulates creativity and resilience, where failure is accepted—even expected—as long as you learn from it. Impact will follow. Grounded in the project-based learning that WPI pioneered and continues to refine, the entrepreneurial ecosystem is interdisciplinary and inclusive.

Students, faculty, alumni, and staff can tap into the expertise and brain power of fellow community members, visiting experts, and successful alumni through such programs as Mentors-in-Residence and the Tech Advisors Network (TAN). Born in the WPI Business School more than a decade ago, TAN is now an expansive network of alumni, veteran entrepreneurs, and other experts, fully integrated as part of the I&E Center, and a critical partner to the Office of Technology Commercialization (OTC).

Add to the mix educational workshops, multiple funding opportunities at all levels of idea development, activities, and resources—many sponsored by or housed within the Innovation Studio—such as makerspaces with tools and prototyping. In addition, each semester 10 teams are enrolled in the i-Corps Site Program, a National Science Foundation–funded program that provides financial and mentoring support to teams that have a promising idea addressing a market need.

"The entrepreneurial mindset is woven into the fabric of WPI—in its curriculum, co-curricular activities, and research, too," says Abel. "It's about building habits, attitudes, and skills that can lead to a business, to improve society, or to be able to pivot in a workplace that we know will look very different in the years ahead."

Nurturing and Guiding

WPI opened the I&E Center––housed within The Innovation Studio but designed to infiltrate courses and collaborations in every corner of WPI—in 2017, and the team has set about nurturing and guiding those who want to start a business, as well as those who want to gain the skills to make them better at whatever they are doing.

Listening to the WPI community and understanding how their needs and goals can be shaped by specific efforts is a priority; Abel says the casual conversations he might have standing in a line or walking to a meeting brings the kind of results that make a difference in how his team approaches their work.

Over a dozen programs are geared to a specific step in the I&E journey—inspire, build, or elevate. Some activities are open to the entire campus and anyone may join the center's formal pitch competitions, the beloved annual WinterSession (a three-day event that gives students, alumni, faculty, and staff the chance to participate in classes and workshops on a variety of topics), or the more casual OpenSpace events (intentionally unstructured meetings to share ideas). Faculty and students come together to challenge each other to apply the I&E skillset—often a mindset—to a project. There are hackathons that inspire students to apply their ideas and knowledge to social issues, and through the I&E Sandbox, students get course credit for creating an innovation or venture through one of their required project experiences.

Infused throughout WPI's approach to innovation is the concept of value creation, guided by the Curtis and Dudley Carlson Value Creation Initiative (VCI, see sidebar). This multipronged initiative challenges and teaches students, faculty, and staff to refine their problem-solving approach. Researchers, for example, can go through the VCI's interactive process of feedback and presentation to clarify and distinguish their value proposition. Because they can clearly articulate how their approach solves a problem in a way no one else has ever done before, they greatly increase their chances of landing a coveted grant or seed funding.

"We want to develop these timeless skills across all disciplines," says Abel. "Even if our graduates aren't interested in starting their own businesses, we want employers to recognize they have mastered fundamental skills in developing innovative solutions with extraordinary value to problems that matter."

Student-Driven Ideas

Sometimes the spark of a good idea just needs some fanning to help it burn brightly. Raymond Magambo '21 (MS, IT) credits Abel, Senior Associate Director of Innovation & Entrepreneurship Kristie DeJesus, and Provost Winston "Wole" Soboyejo with reigniting his dream of transforming bus ticketing in his home country of Tanzania.

Magambo says he came to WPI in search of new ideas after the failure of his start-up Tiketi Rafiki (translation: Friendly Ticket). More than 60,000 Tanzanians use the bus system daily, exhausted and frustrated by the long drive to overcrowded stations, while unscrupulous sellers can make buying tickets in person dangerous. Magambo launched his electronic platform in 2016, but he ran into issues with a third-party payment system that made the company financially unworkable. Feeling discouraged after devoting three years of his life to the venture, he shut down the business and decided to go abroad to earn an advanced degree.

Early in his master's program within The Business School, he happened to be in the Innovation Studio when DeJesus started a conversation that led to his attending a talk about to start. One of the three speakers was a 60-year-old entrepreneur who detailed the ups and downs and ongoing efforts to grow his start-up. Magambo says he had "a life-changing moment" listening to this much older man who was still enthusiastically driving to succeed.

"I had given up on my dream," he says. "But listening to him, I realized it was too early to give up. I called my team on the same day, and said, 'We have to go back into business.' From there, everything started over."

Encouraged by the I&E staff, Magambo applied for and was accepted into WPI's Tinkerbox program, which provides seed money, mentorship opportunities, and educational workshops. He put the $2,000 toward updating the platform with a new mobile payment system sponsored by the Tanzania government. Magambo and his team expect to be up and running in the fall of 2021, once the business license is in hand and contracts with bus operators are signed. In addition, he's one of two student innovation fellows in the I&E Center, where he works as a business program coordinator.

From Idea to Commercialization

In another leg of the I&E journey, when innovators want to commercialize their ideas, the way forward is through the Office of Technology Commercialization and the technical and financial expertise found there. According to Todd Keiller, OTC director, the guidance provided by his three-person team and their partners from TAN has cultivated multiple start-ups, a few of which he's confident are on the cusp of eye-popping success.

"Ten years ago, there was not one active license, not one startup," that spun out of WPI laboratories, says Keiller. The landscape looks quite different today.

Now, the OTC is helping 21 startups that have raised more than $130 million in investment money and created over 100 jobs, mostly in the Worcester area. In addition, 50 active licenses that have been spun out of WPI research have the potential to provide significant non-tuition revenue in the form of royalties.

If faculty members, students, or teams of both believe their idea is commercially viable, they complete an invention disclosure form, which sets off research into "prior art" to see if the idea has already been patented or licensed. Once that search comes up clear, the office works with one of several attorneys, most of whom are WPI alumni, to file a provisional patent.

"That puts a stake in the ground and protects the idea," says Keiller. "It gets expensive one year from the filing of the provisional patent. OTC assists the applicants in finding an existing company to license the patent, create a start-up company to grow the idea, or re-file the provisional patent if there hasn't been a public disclosure."

> "We're helping all innovators, not just those who are looking to start a business with their idea."

OTC encourages inventors who have recently filed a provisional patent to enroll in the i-Corps Site Program. Under the mentorship of alumni and others, teams complete a minimum of 30 customer interviews over a nine-week period.

"It is amazing how a team's value proposition changes from the first class to the last based on customer input," Keiller says. "This makes for a better patent application and focuses the intellectual property on satisfying a real unmet customer need."

Faculty involvement can be an indicator of how likely an idea is to make it through to successful commercialization. At WPI, 30% of intellectual property filings are completed by faculty, with an additional 50% by faculty-student teams.

"The real traction on the start-ups and economic development is through faculty-led intellectual property," says Keiller, citing national studies that show the "spin-out" success rate is much higher for faculty and/or grad student work.

Equally essential to a healthy entrepreneurial support system is the Commercialization Fund, which provides critical early funding for nascent enterprises in exchange for equity. Created in 2012 with more than $550,000 in private donations, the fund's investments are relatively small—around $25,000 in most cases—but can provide breathing space for start-ups, allowing them to build prototypes, complete market research, and bridge the gap to larger external investments. While not all investments pay off, the successful bets are expected to compensate for the failures so the fund will remain evergreen.

Battery Resourcers Charges Forward

Perhaps the furthest along in the commercialization pipeline is Battery Resourcers, a company founded in 2015 as a spinoff from the lab of Professor Yan Wang. Co-founded by Wang's former postdoc Eric Gratz, the company solved the conundrum that had long stymied the burgeoning electric car market: how to efficiently recycle the spent lithium-ion batteries that power the industry.

To fully recover the lithium, cobalt, nickel, manganese, graphite, and other materials in lithium-ion batteries, a recycler needs to be able to go beyond traditional methods that are unable to capture everything. Over the course of several years, Wang, Gratz, and Diran Apelian, founding director of WPI's Metal Processing Institute, figured out how to break down the entire battery to recover the material, and then use that recycled material to create new battery elements, all in a single process.

"It's an environmentally closed loop," says Keiller. "They take in batteries, shred them, treat them, and recover almost all the materials, which go back into making new batteries. There's no waste, no pollution in the process. That's pretty darn exciting."

The company has just closed a $70 million round of financing, and recently signed an agreement with American Honda Motor Co. to recycle Honda and Acura electric vehicle batteries. Those batteries will initially be processed at Battery Resourcers' expanded site in Worcester and later at a new commercial-scale plant, scheduled to be operational in the spring of 2022. The company is expected to jump from 28 to 61 employees as a result.

This expansion, plus plans to build other full-scale commercial plants around the world, will require next-level funding, for which there is already significant interest. With the Big Three automakers pledging that up to 50 percent of the cars they sell annually will be battery electric, plug-in hybrid, and powered by fuel cells by 2030, it's clear the market for recycling spent lithium-ion batteries is about to explode, adding urgency to the expansion.

"They've been told by car companies that 'You have to grow faster because your solution is the best one out there,'" says Keiller.

WPI has equity in the licensing of the intellectual property, and the Commercialization Fund was an early investor. "Our $25,000 initial investment and our patents are now worth over $1 million from the last round of seed funding," says Keiller. "When it goes public, who knows what it will be worth?"

A Sensor for the Road

While Battery Resourcers is well into its journey to commercial success, Roadgnar is just starting out. The year-old venture was founded by Class of 2020 graduates Daniel Pelaez, Noah Budris, and Noah Parker based on technology they unlocked as students.

The trio devised a way to attach a sensor to the back of any vehicle to 3D scan and analyze the condition of a road. In addition to winning a $10,000 prize from the SICK, Inc., LiDAR Challenge, they worked with OTC to secure a provisional patent. Pelaez and Budris also went through the i-Corps program and spent their junior year interviewing potential customers across New England for market research.

They received help from I&E's Tinkerbox program, as well as TAN, including Jeremy Hitchcock '04, co-founder and former CEO of both Minim, Inc., and DynCorp, who provided Pelaez with some veteran guidance when he needed it most.

"We were working every night building Roadgnar while also working our full-time jobs," says Pelaez. At a crossroads, wondering if all the effort was worth it, Pelaez asked Hitchcock whether he thought the business was viable. "He pretty much said, 'Go for it,' which was all I needed to hear. I put in my two weeks at my nice, comfy engineering job and then focused on raising funds from investors. Three months later, we had cash in the bank and my co-founders quit their day jobs as well," he says.

In addition to early seed money and expert guidance from I&E and OTC, an investment from WPI's Commercialization Fund gave them a boost of confidence—and some financial breathing room.

Roadgnar's original business model focused on using the sensors to track potential problems with roadways, allowing public works departments to anticipate deteriorating pavement even before potholes materialized. Municipal governments often rely on expensive external engineering companies for analysis of roads, or simple visual inspection of conditions by town employees.

"The way cities and towns manage their infrastructure today is mostly reactive," says Pelaez. "If something breaks, they fix it. If a citizen complains, or someone gets injured, then they fix it. We wanted them to start being more proactive dealing with these issues."

The City of Worcester is currently piloting the technology and many other municipalities across the country have expressed interest in Roadgnar's innovative solution. The sensors are now small enough to be secured to municipal vehicles, such as trash trucks, so the data can be sent back wirelessly on a regular basis in a passive way.

"Deploying these low-cost sensors allows for infrastructure to be monitored year-round so towns and cities can catch things before they become an issue," he says. "A pothole doesn't appear overnight."

The WPI-led team also includes Bryan Licciardi '03, who recently came aboard as the lead data scientist. Once the team proves the technology works in Worcester, it plans to scale up to serve other municipalities across the United States.

Bringing Ideas to Life

A strong support system grows innovative ideas and encourages students to think as innovators or entrepreneurs in everything they do—classwork, extracurricular activities, jobs, hobbies, or start-ups. In addition, it also helps attract and retain innovative faculty members, many of whom are actively investigating such resources when considering job opportunities. Many start-ups spun out of WPI also put down roots in the local area, providing jobs and stimulating the local economy.

"We provide these resources—seed funding, mentorship, Commercialization Fund investments, innovation fellowships—for students and faculty," says Abel. "We want them to know, 'We are here for you to help you bring your innovative ideas to life.'"

Creating Value with Purposeful Work

The guiding principle of meaningful work and doing research with purpose permeates everything at WPI—from classroom work to projects to research. A new initiative here takes the principle a step further by addressing the gray area of discovery—if you solve a problem, but the solution doesn't bring anything new to the table or doesn't fill a real need, did that work create any new value?

WPI's recently launched Value Creation Initiative (VCI) teaches students, faculty, and staff tactics to ensure the hours they spend in labs, classrooms, and offices have the greatest impact possible. The process distills the intent of work to a "nugget" that identifies a specific need and determines the best solution to solve the problem for the stakeholder.

VCI founders and WPI executives-in-residence Curt Carlson '67 and Len Polizzotto '72 believe that everyone must deliver value to stakeholders—whether that's a funding agency, a professor, a project sponsor, or a supervisor. Value creation teaches strategies using the fundamental principles of the NABC (Need, Approach, Benefit/Costs, and Competition) value proposition framework. With NABC, students, faculty, and staff learn specific steps so their work solves problems that matter to other people.

When value creation is used consistently, the entire university community benefits. As faculty members narrow a grant proposal focus in a value creation forum, their chances of landing significant funding awards, for their research and WPI, increase. They use feedback, iteration, and the application of core value creation concepts to answer the most important question a funding agency has: Why should they fund this researcher for this project over everyone else?

In turn, they pass along this new knowledge to students. As students gain value creation literacy, greater success and project impact result—accompanied by a boost in professional confidence and competence. Through the process, students apply fundamental skills that improve their immediate work and prepare them to be workforce ready at graduation.

According to Carlson, WPI's project work creates the ideal working environment for putting value creation into a real practice; it also creates a new distinction for WPI. The goal of student projects is not just to complete a task, he says, but to deliver value and solutions that matter to others. "Only WPI has embraced that perspective," he says.

—Julia Quinn-Szcesuil

Nominate WPI Alumi

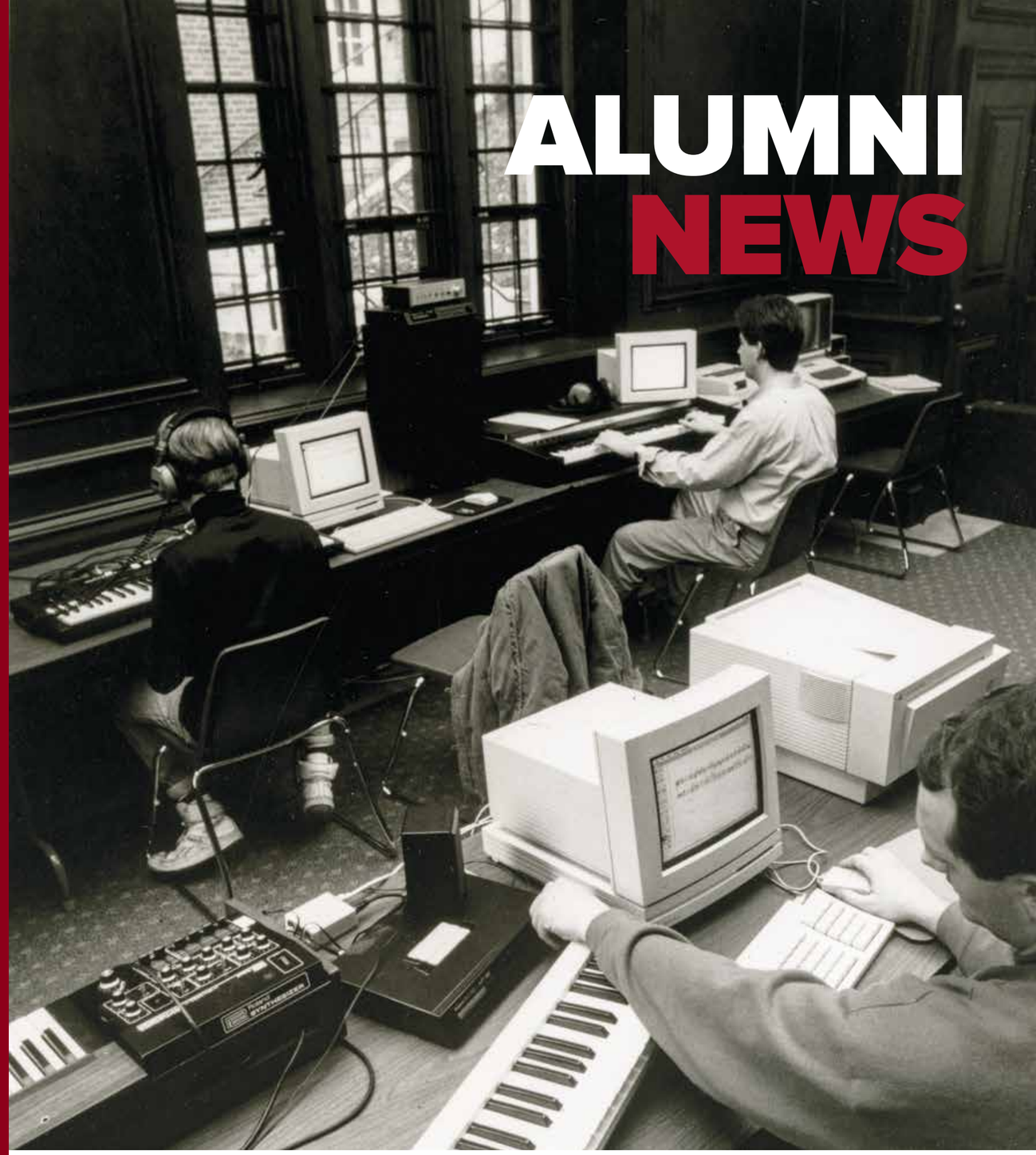
As WPI continues to meet the ever-growing demand for skilled and knowledgeable humanist engineers, the WPI Alumni Association is again preparing to recognize and celebrate members of the alumni community. Nominations are now open for alumni from classes ending in 2 and 7. Please consider nominating a WPI graduate for their professional achievements, service to the university, service to the Alumni Association, and service to their local and global communities.

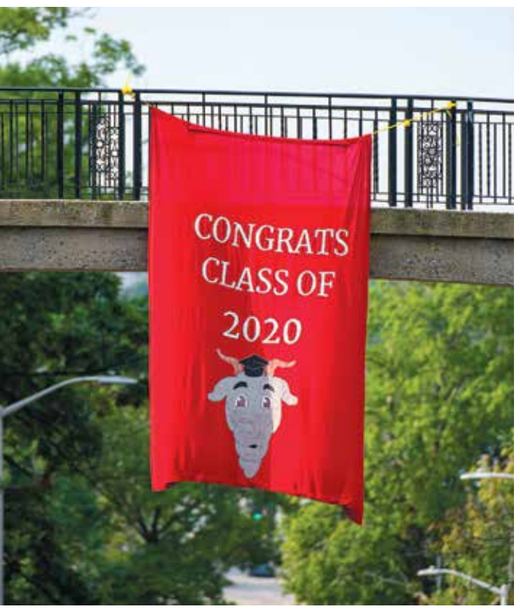
- GOAT'S HEAD AWARD FOR LIFETIME COMMITMENT TO WPI
- JOHN BOYNTON YOUNG ALUMNI AWARD FOR SERVICE TO WPI
- ROBERT H. GODDARD ALUMNI AWARD FOR OUTSTANDING PROFESSIONAL ACHIEVEMENT
- WILLIAM R. GROGAN AWARD FOR SUPPORT OF THE MISSION OF WPI
- THE EDWIN "TED" B. COGHLIN JR. '56 HUMANITARIAN LEADERSHIP AWARD
- ALBERT H. SCHWIEGER AWARD FOR OUTSTANDING PROFESSIONAL ACHIEVEMENT (BY A SIM GRADUATE)
- HERBERT F. TAYLOR ALUMNI AWARD FOR DISTINGUISHED SERVICE TO WPI
- ICHABOD WASHBURN YOUNG ALUMNI AWARD FOR PROFESSIONAL ACHIEVEMENT
- WPI AWARD FOR DISTINGUISHED SERVICE

Learn more about the Alumni Association awards at:
wpi.edu/alumni/awards/about

Make a nomination at: *wpi.edu/+AlumniAwardForm*

ALUMNI NEWS





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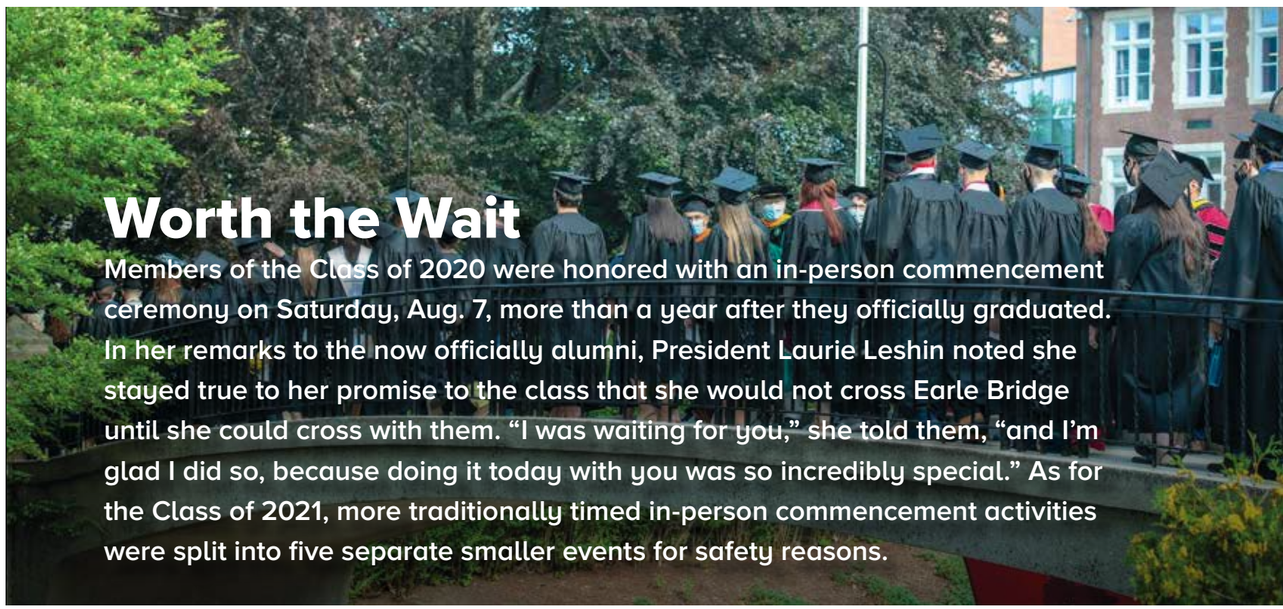


Worth the Wait

Members of the Class of 2020 were honored with an in-person commencement ceremony on Saturday, Aug. 7, more than a year after they officially graduated. In her remarks to the now officially alumni, President Laurie Leshin noted she stayed true to her promise to the class that she would not cross Earle Bridge until she could cross with them. “I was waiting for you,” she told them, “and I’m glad I did so, because doing it today with you was so incredibly special.” As for the Class of 2021, more traditionally timed in-person commencement activities were split into five separate smaller events for safety reasons.

From the Desk of

PAULA (FRAGASSI) DELANEY '75
PRESIDENT, WPI ALUMNI ASSOCIATION

Welcome to the WPI Alumni Family

I'd like to formally welcome the Class of 2021 to the WPI alumni family. In maintaining COVID-19 social distancing and capacity guidelines, the university decided against the traditional large-scale commencement ceremony for the Class of 2021 and instead scheduled five individual events over a period of three days. The ceremonies were established by degree programs, departments, and schools, and the two-guest limit allowed graduates to experience smaller, more personal events. By all accounts, the reimagined commencement exercises were a huge success.

Additionally, I offer an extra special welcome to the Class of 2020, as they too made their final walk across Earle Bridge during their August 2021 commencement ceremonies. As the pandemic forced the May 2020 postponement of commencement for the Class of 2020, graduates experienced their long-awaited commencement ceremony as especially meaningful. Over 660 graduates—including undergraduates, master's degree, and PhD candidates returned to campus to celebrate the important milestone, and in true WPI fashion, graduates accepted their diplomas with fortitude and grace. Almost 2,000 guests were in attendance to support the graduates, and the university succeeded in providing a festive and celebratory event for all.

On behalf of the Alumni Association Board of Directors, I'd like to offer gratitude to the WPI Division of Student Affairs for hosting six separate commencement ceremonies within three short months. We thank you for taking on this Herculean task and helping to usher our newest members into the WPI Alumni Association.

wpi.edu/+alumni
wpi.edu/+give

Q&A

with Alumni Association President Paula (Fragassi) Delaney '75

What does your role as president entail?
The Alumni Association acts as a voice and advocate for the alumni body. We work to help our alumni become involved with WPI and connect with each other in support of the university.

What will you focus on during your term as president?
We have learned over the past year that through online presentations and meetings we are able to connect with a much broader base of alumni. WPI has been able to interact with our constituents from around the world, sharing information on a variety of topics, such as current activities on campus, new faces, new programs, student projects, and numerous topics of general interest. I will work to find ways to leverage these activities and continue strengthening these relationships with all our alumni.

What goals have you set for your term as president?
It's important to maintain and expand the variety of the programs and initiatives serving our alumni and students. It's through these interactions that we can foster continuing interest and alumni support to WPI. Also, we will continue to build our support of WPI's Diversity, Equity, and Inclusion initiatives in helping the university set standards and expectations for a campus environment that is accepting and welcoming to all.

Can you describe your time as a student at WPI and how it shaped you as a person?
I was a student in the first class admitted under The Plan; we were part of a new experiment. Faculty, administrators, student services, and campus leaders were all immersed in helping us navigate the hurdles of new courses, individually paced instruction, seven-week terms, new grading systems, off-campus projects, and more. It was a time without cell phones, calculators, or the internet. Yet, it was also much the same as today. We became problem solvers, with shared successes and failures. We worked side by side to learn what we needed to accomplish, and we faced each hurdle with creativity and confidence that we could work out a way forward. These are the opportunities and experiences that we all have had, that have helped shape us in our approaches to careers and our lives.

Why is staying connected with your alma mater important to you?
As both an alumna and a former employee of WPI, I have made many friends on the Hill. I am fortunate to have met and worked with many alumni leaders from the classes of the 1960s to today. It is energizing and rewarding to continue to refresh those connections, and learn about the ongoing research and project experiences of the students and faculty of today.

What is your message to WPI alumni who haven't yet found a way to get involved with WPI after graduating?
You can find links for more information on alumni groups and volunteer opportunities at www.wpi.edu/alumni. We also send out regular campus updates and event information in The Bridge newsletter and, of course, the *WPI Journal*.

Is there anything else you'd like to share?
As alumni, we look back at our time on campus with fond memories of our experiences, and our friendships. If possible, please plan on visiting campus for future Homecoming and Reunion celebrations. Remember: You always have a home on the Hill.

—Sira Naras Frongillo

TURNING POINT

PHOTO BY SCOTT ERB-DONNA DUFAULT

A Personal Journey Uncovers a Love of Teaching

After two car accidents left him with unrelenting back pain, **Arnold Lee '98** grew frustrated with traditional Western medical practitioners, who either dismissed his suffering, or recommended surgery as the only solution. Lee began what he calls "a journey of self-discovery" to explore other ways to heal his body.

"I have a very analytical mind, trained by WPI, of course, and I investigated all these different alternative health options," says Lee, including the Alexander Technique, Feldenkrais Method, Rolfing, Thai Massage, and the one he ultimately connected with: Pilates.

He was working as a software engineer at the time, not fully committed to the career and searching for more meaning in life. The Pilates connection was so strong, he quit the high-tech world and pivoted to teaching a discipline that had both eased his back pain and brought him inner peace. Twenty years later, he's a highly regarded lead master Pilates trainer, one of several dozen who offer Comprehensive Pilates Certification, recognized worldwide by any organization.

"The reason I chose Pilates is that it was a wonderful whole body, integrative mind-body discipline that helped me heal," he says. "We, as human beings, need that mind-body integration—we can't be all mind, or all body. I knew there was value to this."

Lee drew upon years of martial arts training to approach teaching in a methodical way, seeking deep understanding so that he could challenge preconceived attitudes.

"For me, I'm very left brain—I like to break things apart," he says. "When you work out, you may just want to feel good. But sometimes, you want to know why this particular move benefits me. When I started to break it apart, I found that was very useful when it came time to teach other people how to teach Pilates."

A former board member of the Club Pilates Education Committee, Lee says the best teachers recognize that everyone has a different way of learning. Customized interactions make that person feel valued as an individual. "An instructor is someone who teaches the basic art; a teacher teaches the person. Every time you step out there, you have to ask yourself, are you teaching the art, or the person?" says Lee.

He appreciates the quality of his education at WPI, especially the work ethic that was nurtured by his engineering professors. But he credits Professor Wesley Mott of the Department of Humanities and Arts for expanding his world view. Mott's class on New England authors awakened his creative right brain and introduced him to new ways of thinking.

Lee recognizes that the collaborative skills he learned through the interactive and major qualifying projects were valuable—even if he didn't know or appreciate it at the time. The MQP seemed especially burdensome to him as a college senior eager to graduate, but he now recognizes it forced him to learn essential skills, like how to work as a team.

"You may not realize you are developing those collaborative skills, but you are. Being able to work with other people in a community is super important. Even if you are super anti-social, you are always dealing with a community. If you don't learn how to work with other people, and take care of other people, you aren't going to take care of yourself either," he says.

Lee also participated in the WPI co-op program, which added to the variety of his experiences and helped him become a better person.

"When people lock themselves into a certain identity, that's fine. But I realize the more experiences you have, the more relationships you have, the richer your world becomes," he says.

The Club Pilates franchise system relieves the stress that comes from running a business, allowing more people to discover the discipline. As new studios open around the world—in Canada, South Korea, Germany, Japan, and Saudi Arabia—Lee and three other Club Pilates Lead Master Trainers evaluate every new instructor who gets hired to maintain quality standards. Ultimately, he wants to be able to provide an experience that is safe, consistent, and helpful.

"What started out as a deeply personal journey to try to heal myself turned into an arena where I'm applying a lot of analytical thought to teaching others," he says.

—Kristen O'Reilly

[WPI *legacy*]

Family legacy at WPI is a long-held tradition, with noted cases of three and even four generations of family members donning the crimson and gray. This year, as members of the Class of 2025 experienced their first crossing of Earle Bridge, almost 70 of the first-year students were following in the footsteps of one or more of their parents.

Passing Down the Engineer Gene

Will Perri '25 has wanted to study engineering for as long as he can remember. Over the years, Will and his father, **David Perri '93**, would spend hours at a time discussing engineering, and once Will developed an interest in robotics engineering, WPI became the obvious choice for his university education. "It feels great to be enrolled in a school where I can study engineering and follow in my dad's footsteps. My dad became an excellent engineer because of WPI, and I hope I can follow his lead," says Will.

"Having Will enrolled at WPI is just one more bond that I have with him—and it's an exciting one! We've been talking about technology for years, and I can't wait to see what he does with his WPI education," says David.

As an electrical and computer engineering major, David found his way to WPI while searching for both a strong STEM program and a small campus community. Today, he is the chief product and supply chain officer at Superpedestrian, where he is responsible for the product roadmap, supply chain, and engineering. The company is on a mission to transform urban transportation and protect the environment.

David recalls his time at WPI as being highly impactful in his life, and he credits the experience he gained during his Interactive Qualifying Project (IQP) as especially formative to his professional career. Teaching basic statistics concepts to kindergarten students in the Worcester Public Schools system, he and his team members faced widely varying perspectives from their project partners, as well as from a student body made up of widely differing backgrounds, learning styles, and interests. This dynamic environment required the team to develop an interdisciplinary approach to problem solving that grew and stretched Perri in ways that inform his management style today. He currently leads teams with disparate skills, backgrounds, and approaches, and he still calls upon lessons learned during his IQP experience—understanding that everyone is different and brings something unique to a team—and that is what makes a team stronger.

David recently shared, "Part of the fun in leadership is spending the time to really think about how to provide an environment where you can bring out the best in people—exactly what we were trying to do when we set out to teach statistics to those Worcester kindergarten students during my IQP."

In addition to the senior Perri's positive academic experience at WPI, his experience as a pole vaulter on the Men's Track and Field team allowed for another area on campus where he could strive for excellence. Beyond the welcome break from the rigors of WPI's intense course schedule, the WPI athletic program helps student athletes increase their physical health, collaboration skills, and self-confidence; he also credits his athletic experience at WPI as a fantastic opportunity that allowed him to make friends. Having the hindsight of a full WPI experience, David is optimistic his son will have a positive collegiate experience. He encourages Will to take advantage of opportunities for extracurricular activities and to find his balance between the rigors of the academic coursework and the enjoyment of making new friends and fostering new interests.

—Sira Naras Frongillo

BEYOND THESE TOWERS

THE CAMPAIGN FOR WPI

Now, more than ever, the world needs what we have created and what we do at WPI.

The distinctive towers of WPI's first two buildings are enduring symbols of the simple but powerful idea that is the university's bedrock: theory and practice, knowledge and skilled art, learning and doing. With the Two Towers ideal as our anchor, we are stepping beyond our sphere of comfort, beyond these storied towers, to play an ever-growing role in understanding and meeting the needs of a profoundly interconnected and interdependent planet.

Now, more than ever, the world needs WPI's innovators, educators, makers, and doers—people with the know-how and the tenacity to work across disciplinary, cultural, and geographic boundaries to take on the world's greatest and most consequential problems. Realizing the vision of a truly globally engaged university will take an unprecedented commitment from the greater WPI community; this goal is beyond any set before:

$500 million

$350 million in philanthropy
$150 million in sponsored research

But we are undaunted, for imagining and developing solutions to the toughest challenges is in our DNA. Our drive to go beyond is fueled by the belief that what we have created and what we do at WPI can be of immense value to a world beset by challenges. We need champions to help us get there.

Be a champion.

Beyond These Towers: Campaign Priorities

Here is how this campaign—and your part in it—will drive positive change.

Beyond these towers are tomorrow's global problem solvers, innovators, and leaders.

Our goal: $100 MILLION

For undergraduate scholarships and graduate fellowships and the academic and student life programs that prepare graduates to make a positive difference in the world—as students and as alumni.

Beyond these towers is a new model for a world-spanning, globally engaged university.

Our goal: $50 MILLION

For The Global School and its initiatives, Global Project Centers, and our unique Global Lab, as well as programs that expand and deepen WPI's capacity to create positive change, globally and locally.

Beyond these towers our research and scholarly work are changing the world.

Our goal: $100 MILLION

For graduate fellowships, endowed faculty chairs, graduate programs, and the dynamic research ecosystem that fuels WPI's national and international reputation and is ultimately aimed at solving critical problems and improving lives.

Beyond these towers is a global community energized and propelled by innovation and inclusion.

Our goal: $100 MILLION

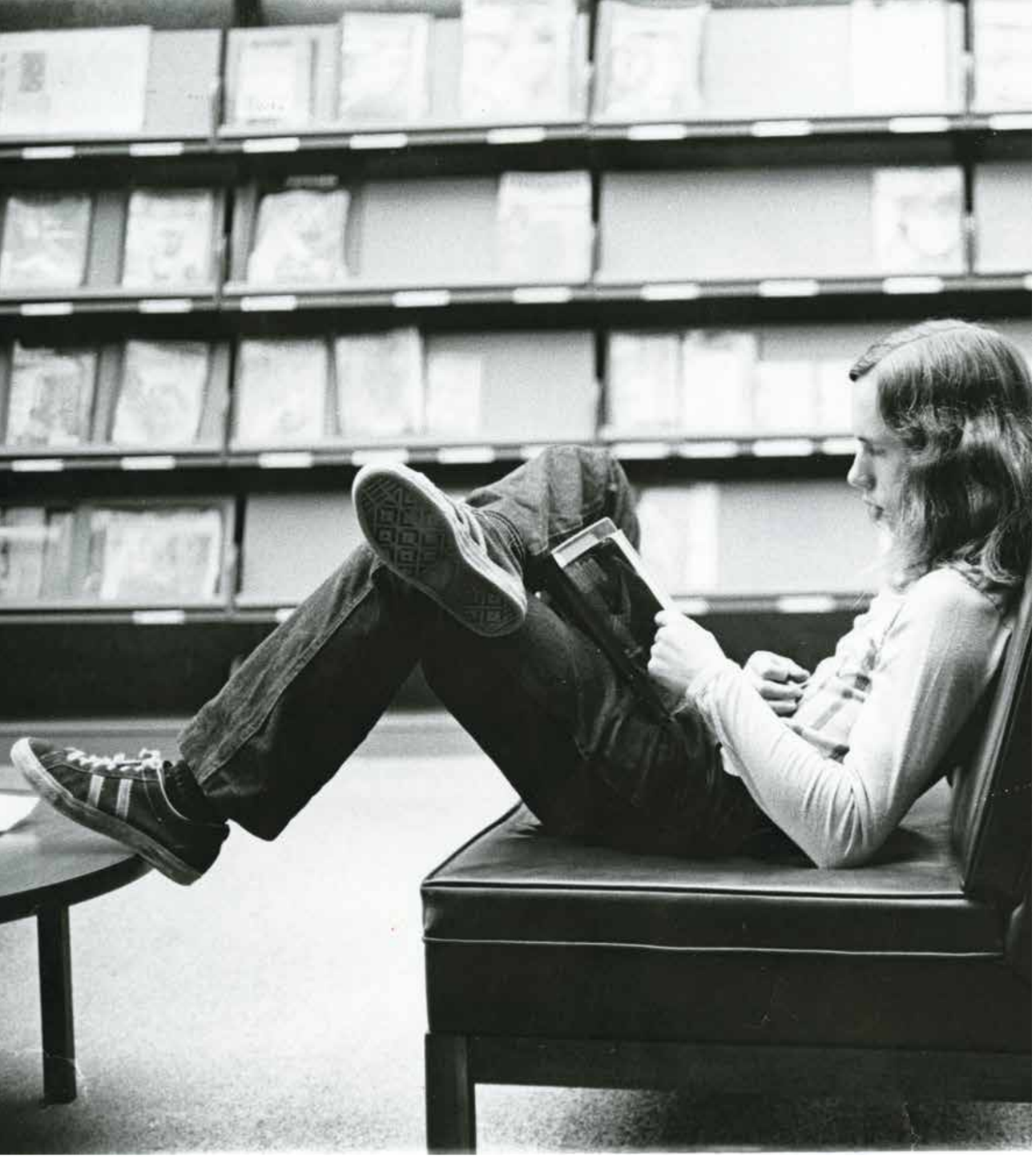
To support faculty, students, staff, and programs that ensure our students graduate with entrepreneurial mindsets and learn how to create value, our community is supported in its pursuit of excellence in all things, and that we are living our promise of creating a campus community where each person feels a sense of belonging.

Beyond These Towers is where a strong, innovative, inclusive, globally engaged WPI will make its mark on our 21st century world.

In *Two Towers,* WPI's centennial history, Mildred Tymeson famously observed that WPI has endured, evolved, and prospered "because—by some strange and wonderful supply—there have always been enough people who cared."

It is time, once again, for people who care to come forward and come together as WPI embarks on an unprecedented journey.

Like explorers down through the ages, we are driven by what we may gain and by what we will share—by how we will grow and change for the better, and how we will bring positive change to the world around us. With ***Beyond These Towers: The Campaign for WPI***, we launch an expedition to tomorrow's university and a brighter world.



CLASSNOTES

submit yours to ***CLASSNOTES@WPI.EDU***

1953

David Hathaway says, "Greetings to classmates from '53: Currently enjoying our summer home on the Island of Islesboro in Penobscot Bay, Maine. We never knew back in 1947 what island living would be like and took the chance to invest in land and then property with an abandoned large home. This home has been constantly improved by our sweat and tears, where I have personally—alone—sided the building with the rear three levels and built a garage large enough to house our 20 ft. O'Day Mariner on a trailer, so it is 24 ft. deep. In the recent years, we have shared this with many of our family and friends. I have survived aplastic anemia and also—with a new hip—escaped from an arthritic hip holding me down.

1956

A note from **Jack McHugh**: "I noticed that the *WPI Journal* does not list any class in the Alumni section before 1960. Our class is still active and still has potential for WPI."

—Ed. note: In the past year the Journal has published 10 notes from pre-1960 classes. But, we agree, that's not enough! We encourage graduates from every class year to send in their news.

1968

John Kraska started helping out in his father's auto parts store at age 7, rolling tires into the building. On Saturday, July 31, 2021, the tires had to go somewhere else—Kraska Corp., the last mom-and-pop auto parts store in the city, closed its doors after 67 years. "As my grandfather said, there are two things money can't buy: health and time. While I'm healthy, I want to use my time wisely." Read the full story in the *Worcester Telegram & Gazette* (July 26, 2021).

Phi Kappa Theta brothers **Cary Palulis**, **Bob Pleines**, and **David Hopkinson** got together (as they do every year) for some fishing and a boat ride. "Great day for the old timers who are finally slowing down just a bit," they say. "We are looking forward to meeting at WPI for our 55th reunion in 2023!"

JOHN KRASKA '68

BILL KAMB '72

1972

Bill Kamb, a coin collector since the late 1950s, has received the Paul Fiocca Award from the Royal Canadian Numismatic Association. Beginning in 1990, Bill typically attended three RCNA events a year; in 2002 he was elected an RCNA area director, a role in which he continues today.

1973

Donald Polonis writes, "Recuperating after open heart surgery at University of Virginia Hospital in Charlottesville. After five weeks, feel like a 50-year-old again. Ellen and I bought a place at Lake Monticello in 2020 to be near her first grandson and my sixth grandchild. Loving the lake life!"

1979

Stephen Rusckowski, chairman, CEO, and president of Quest Diagnostics, was honored as a New Jersey Business Hall of Fame 2021 Class Laureate.

SUPAWAN TANTAYANON '82

1980

Tony Sophonpanich was featured on the July cover of *Forbes* Asia for his bank's landmark deal acquiring Indonesia's Bank Permata.

1982

George Oliver, chairman and CEO of Johnson Controls, was featured in July on *Meet the Leader*, a podcast from the World Economic forum that features the world's top changemakers.

Supawan Tantayanon (PhD CH), chair of the Council of Science and

"WPI was high on my list of schools due to the WPI Plan. However, being one of six children, my family had limited financial resources and I was required to attend a school that provided significant financial aid. There is no way I would be where I am today, both personally and professionally, without the education and the financial help I got from WPI. That is why scholarships are so important to me and why I created the Janet L. O'Leary '84 Endowed Scholarship."

JANET L. O'LEARY '84
ALDEN SOCIETY MEMBER SINCE JUNE 2017

HAVE YOU INCLUDED WPI
in a will or trust? In a life income gift? As a beneficiary of life insurance, IRA, or other retirement account? Membership is about giving you recognition NOW for your plans to support WPI in the FUTURE. To join, visit ***plannedgiving.wpi.edu***.

FOR MORE INFORMATION Lynne Feraco, Assistant Vice President of Gift Planning
774-239-7326 | *lferaco@wpi.edu*

ALDEN SOCIETY

Technology Professionals of Thailand, has been awarded the 2021 Distinguished Woman in Chemistry or Chemical Engineering from the International Union of Pure and Applied Chemistry. She also chairs the Science Society of Thailand under the patronage of His Majesty the King, and was one of 12 women from around the world recognized with awards at the IUPAC World Chemistry Congress 2021.

Rob Oshana has been named general chair of the 59th Design Automation Conference. Rob is vice president, software engineering, R&D, at NXP Edge Processing.

1984

Paul Nowak has joined Orion Engineered Carbons S.A. as sales manager. He is responsible for leading OEC Specialty Carbon Black sales in the Northeast, developing and implementing new regional sales strategies and leading selected global key accounts.

1986

Chris Coulter recently joined VMEC as advanced manufacturing technology advisor. He has been instrumental in developing new products and implementing manufacturing technology throughout his career as well as working in regulated industries including defense, medical device, and the FDA. His focus is assisting companies with Industry 4.0 advanced manufacturing technologies to increase growth and competitive advantage.

1988

Steve Farr has been elected one of three new vice presidents at Nitsch Engineering and serves on its Board of Directors. His 30 years of experience in the engineering field has centered around designing

PAUL NOWAK '84

STEVE FARR '88

KUTHAN TOYDEMIR '03

roadway improvements that balance multi-modal safety with operational efficiency, while integrating green infrastructure. He is a member of the Conservation Commission in Needham, Mass., and has been a member of the American Society of Civil Engineers since 1988.

1994

Suresh Doki has been appointed a member of the Board of Directors at Futuris Company, Fairfax, Va. He began his career as a systems administrator at WPI, and has held positions of CEO of Cambridge Systems, and CEO of Paragon Systems. Most recently, Suresh has served as an independent merger and acquisition consultant for various clients.

1995

Derek Adams has been named chief operating officer at PlateletBio in Watertown, Mass. He previously served as chief technology and manufacturing officer at bluebird bio, a leading lentiviral gene therapy company in Cambridge.

1996

Alan Assner is now assistant vice president of Individual Annuities at The Standard, a life insurance company in Portland, Ore. He is responsible for oversight of actuarial, sales distribution, operations, service, and strategy for the line of business.

1997

Natalie Grace, a partner at Gardella Grace, LLP, earned a 2020 IAM 1000 ranking for patent prosecution.

1998

Henna Karna joined Creative Destruction Labs as a mentor; she currently serves as managing director, Re/Insurance & Risk Management Solutions at Google.

1999

David Proia has joined ROME Therapeutics as vice president of oncology to advance oncology strategy and accelerate the application of repeatome insights to cancer research. Previously he was senior director of In Vivo Pharmacology at C4 Therapeutics. He earned his PhD in molecular and cellular biology at Baylor College of Medicine.

2003

Kuthan Toydemir is head of homologation and technical compliance of Koenigsegg Automotive AB. He recently was appointed president of ESCA (Exhibition Services and Contractors Association).

2005

Alex Castano is vice president of marketing at Healthcare Network in Greater Naples, Fla. Previously, he worked for the global advertising agency GREY, where he applied data science to make marketing campaigns more effective for such clients as Febreze, Gillette, and Pfizer, among others. He earned his MBA, specializing in brand and product management, at the University of Wisconsin-Madison.

2007

Doug Foley (MS PSM) has been named president of Eversource's New Hampshire operations. In his previous role, Doug was responsible for leading the team that maintains and constructs Eversource's electric transmission and distribution systems in Massachusetts and served as incident commander for major power restoration efforts.

2011

Laura-Ashley Alegbeleye has joined the Center for Excellence in Education in McLean, Va. As a member of its STEM Teacher Enrichment Program, she helps to increase the program's reach to connect even more rural and urban middle and high school underserved teachers and students with leading experts from industry and academia.

2013

Sarah Gile ('14, MS MGT) is a physician assistant at Mountain View Family Practice, Baldwinville, Mass.

MEMBERS OF THE CLASS OF 2021 WERE HONORED AT SEVERAL SMALLER, MORE PERSONAL COMMENCEMENT EVENTS, ASSEMBLED BY DEGREE PROGRAMS, DEPARTMENTS, AND SCHOOLS, ON MAY 19–22.

SARAH GILE '14

SIERRA PALMER '19

2014

Worcester Business Journal's annual 40 under 40 lists two alumni from the Class of '14 who are co-founders of Solvus Global in Worcester, Leominster, and Webster, Mass.: **Aaron Birt (MS; '17 PhD)**, CEO of Solvus Global and Kinetic Batteries in Worcester, who is working with the WPI Venture Forum to build up the Worcester entrepreneurial ecosystem; and **Sean Kelly ('16 MS; '18 PhD)**, who is COO of Solvus Global. According to the WBJ, Kelly "helped convert the company's first Small Business Innovative Research grant with the National Science Foundation from a $250,000 Phase I to a $1-million Phase II grant, significantly expanding its funding, and focusing on developing a scrap recycling optimization tool based on research Kelly completed as part of his graduate and doctoral studies."

Diana Nguyen has been elected to the Board of Directors of the Greater Lowell Community Foundation. As Project Manager at MilliporeSigma in Burlington, Mass., she provides critical support to the Integrated Supply Chain Operations leadership team, manages strategic projects, and develops a global talent pipeline of aspiring and curious leaders.

2018

Matias Campus ('19 MS) is founder and CEO of Astralintu Space Technologies, a start-up focused on providing in-orbit services that look to grant space access to new actors in Latin America and the world.

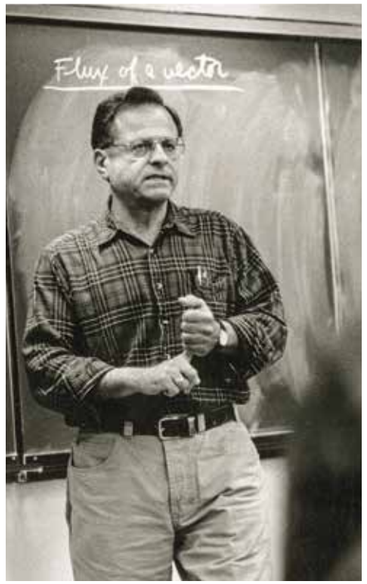
2019

Cherie Cain (MS SYS) is a principal systems engineer for Collins Aerospace, a unit of Raytheon Technologies. She leads cross functional teams for the development and sustainment of air management systems for commercial aircraft.

Sierra Palmer is an undersea warfare analyst in the Naval Undersea Warfare Center (NUWC) Division Newport's Undersea Warfare Engineering and Analysis Department. She recently won the Society of Women Engineers 2021 Helen Martha Sternberg Award.

2020

Irene Wong (MS MGT) is a junior analytics specialist at REQ, where she strives to use her knowledge and experience in data analysis to help clients succeed in the marketing world.



James Demetry ’58

Longtime Professor and Champion of the IQP

James “Jim” Demetry, a longtime professor of electrical engineering at WPI and one of the earliest and most passionate advocates for the Interactive Qualifying Project (IQP), the most distinctive element of the WPI Plan—the university renowned project-based approach to education—died June 24, 2021, after a long illness.

Demetry earned bachelor’s (1958) and master’s (1960) degrees in electrical engineering at WPI and a PhD in the same field at the Naval Postgraduate School (NPS) in Monterey, Calif., where he served as a civilian faculty fellow while completing his studies. He then taught at the NPS, rising to the rank of associate professor, before joining the WPI faculty in 1971, just a year after the faculty voted to adopt the revolutionary Plan.

He contributed significantly to the Plan’s implementation, most notably as the inaugural director of the Division of Interdisciplinary Affairs, which had primary responsible for the IQP and student-designed interdisciplinary majors. He also greatly enjoyed opportunities to advise student teams completing IQPs at many of WPI’s global projects centers.

In 1986, he helped establish the Educational Development Council, which promoted high-quality teaching through workshops, annual grants for teaching innovation, and other programs. He served for a time as associate head of the Electrical and Computer Engineering Department, chaired the faculty Committee on Governance and the Committee on Tenure and Academic Freedom, and was twice elected secretary of the faculty. He received the Board of Trustees’ Award for Outstanding Teaching in 1995.

His interest in the environment spurred him to become involved in local government. He was appointed by the town manager to the Holden Planning Board, serving for nine years, and was elected to the Holden Board of Selectmen, serving for seven years, including one year as chairman.

Demetry leaves his wife, Susan Stafford, and three daughters: Sara Demetry, **Chrysanthe Demetry ’88**, and **Athena Demetry ’91**. He was predeceased by his first wife, Sally Weidlein, and his sister, Theo.

Harris Miller ’41, CHE, ALPHA TAU OMEGA, Vienna, Va.

Walter Hatch ’46, CE, Bethel, Maine

Louis Block ’48, PH, ALPHA EPSILON PI, Ramona, Calif.

Albert Merlini ’48, EE, Laconia, N.H.

Richard Connell ’50, EE, LAMBDA CHI ALPHA, Mendham, N.J.

Henry Taylor ’51, ME, THETA CHI, East Livermore, Maine

Robert Lemay ’57, EE, MS EE, PHI KAPPA THETA, New Fairfield, Conn.

Robert White ’57, ME, LAMBDA CHI ALPHA, Forestdale, Mass.

Normand Bedard ’58, EE, Saint Petersburg, Fla.

Donald Hayward ’58, EE, Greensburg, Pa.

David Daubney ’59, ME, MS Management, Douglas, Mass.

Peter Nelson ’59, ME, SIGMA PHI EPSILON, Murrysville, Pa.

David Geoffroy ’60, BS ME, SIM, THETA CHI, Holden, Mass.

Robert Hawes ’65, PH, ALPHA TAU OMEGA, Charleston, S.C.

Donald Rich ’65, SIM, Fremont, N.H.

John Braun ’66, Management, PHI KAPPA THETA, Parkland, Fla.

Georges Caplette ’70, MS Natural Sciences

Herbert Coulter ’70, BS CHE, MS CHE, PHI SIGMA KAPPA, Newton Square, Pa.

Elden York ’70, EE, SIGMA PHI EPSILON, Daytona Beach, Fla.

Mark Candello ’75, EE, Swanzey, N.H.

William Estabrook ’76, SIM, Millbury, Mass.

Ronald Drewiany ’79, CE, Middletown, Conn.

Anthony Messa ’79, MS Natural Science, Manchester, N.H.

Harold Morsilli ’82, MS CE, North Smithfield, R.I.

Frans Soderlund ’87, SIM

Mario Papale ’89, SIM

Joseph Couble ’93, ME, Spofford, N.H.

Lorenzo Desimone ’22, CS, Greenville, R.I.

Jiyang Wu ’22, RBE, Newton Center, Mass.

Liam Godin ’23, CS, Cumberland, RI

The WPI community also notes the passing of these friends of the university: **Elizabeth Halloran**, **C. McDonough**, **Kathleen Markees**, **Liz Tomaszewski**, and **Christine White**.

Complete obituaries can usually be found online by searching legacy.com or newspaper websites. *WPI Journal* will assist classmates in locating additional information. Contact *wpijournal@wpi.edu.*

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