JOURNAL

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A SEA CHANGE

Once an aspiring test pilot, Casey Brown '16 pivots to building ocean-exploring drones.

PHOTO COURTESY SAILDRONE

A SEA CHANGE

Once an aspiring test pilot, Casey Brown ’16 pivots to building ocean-exploring drones.

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LETTERS

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 Letters that mock or insult will not be published.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.

A POPULAR FEATURE NEEDS YOUR HELP

You might think that in a world awash with social media, where we can share personal and professional news immediately with very little effort, the Class Notes section of a magazine like the *WPI Journal* might be considered anachronistic. Yet industry reader surveys have indicated time and again that Class Notes is one of the most popular features of any university magazine, especially at small- to medium-sized institutions.

A look at Google Analytics shows that trend reflected in the digital *WPI Journal*: The Class Notes section receives the most page views of any feature—by far. Sometimes twice as many views as the next-most popular page in each issue.

Despite this popularity, we've been running light on this type of content lately. So, dear reader, here's a plea to send in your news to keep your fellow alumni updated on what's happening in your life. It doesn't have to be a major milestone (although job changes and weddings are always good fodder). Perhaps you ran into a classmate and shared a fun memory, or you published a long-awaited book, or met a personal milestone.

Sometimes we're alerted when WPI alumni are featured in traditional media outlets (often because they mention their alma mater), and that information is converted into a note. But there's plenty of news we miss—if you know an alum who's been featured somewhere lately, send a link to the story and we'll check it out. They may even be considered for a larger profile in an upcoming issue.

Some schools use class agents or diarists to collect and write the news of their classmates, and the results can take up a huge chunk of each issue. Although that's not the WPI tradition, you can help keep your fellow alumni informed by sending a quick email to an account specifically set up for this purpose: classnotes@wpi.edu. And as a bonus, include a photo, too (at least a 1MB file for use in the print version).

Wishing you health and happiness this summer.

—Kristen O'Reilly
Editor

MG OR MGE?

A QUESTION FROM A PROUD ALUMNUS

It is with sadness that I read of Todd Akin's passing in the *Journal*. He was a friend and fellow classmate of mine in the management engineering degree program. I noted that you had titled his degree MG, which I believe was added several years after our graduation. Is this now the encompassing degree designation for all management-related programs?

Todd was proud of his WPI management engineering degree and if my recollection is correct was listed as such in his US Congress biography. Dave Emery EE was another from the Class of '70.

I am proud of my WPI management engineering degree as are other students who undertook the same course and found it a springboard to many different careers.

The recent changes in the *Journal* are excellent and show a great deal of craftsmanship.

Kindest regards,

—Greg Backstrom '70

Editor's Note: MG is legacy coding for management engineering majors. The registrar, and therefore our alumni database, now uses MGE for that major.


WINSTON "WOLE" SOBOYEJO

"WPI's investment in additional financial aid for students has grown by over $20 million, to a $122 million annual aid budget, an important step in increasing affordability and decreasing student debt. We also continue to raise the bar for teaching and learning as we infuse value creation and innovation into who we are and what we do at WPI."

At press time, a month into my service as interim president, there is already much to reflect upon and still more to look forward to in the year ahead. As we navigate this presidential transition period, the WPI community continues to amaze and to inspire me.

From the celebration of Alumni Weekend to review and planning meetings with the university's academic and administrative leadership team to day-to-day business across campus and around the world, I see clearly that we are well-positioned to continue our progress.

The many institutional strengths reflected in our strategic plan, Lead With Purpose, will ground us as we confidently enter into this new stage of our history. We continue to increase our efforts in diversifying our student population. WPI's investment in additional financial aid for students has grown by over $20 million, to a $122 million annual aid budget, an important step in increasing affordability and decreasing student debt. We also continue to raise the bar for teaching and learning as we infuse value creation and innovation into who we are and what we do at WPI.

It is important to note that the distinctiveness of our work and the strengths of our foundation and approach to education were most recently recognized by the New England Commission of Higher Education in its report continuing WPI's accreditation. Among other strengths, our holistic focus on students was emphasized.

In my conversations these past weeks, I've been struck with how all our stakeholders are consistent in what they value and cherish about WPI. Of course our distinctive project-based learning is noted with pride, as well as how faculty address global challenges in their research—fittingly called "research with a purpose"—and involve the next generation of young scholars and changemakers in that mission.

It takes every part of WPI to truly transform the lives of our students. We're a national leader in providing new teaching tenure tracks that give our faculty a true sense of belonging and investment in WPI. We recognize that the national mental health crisis requires a sustained, thoughtful response, and we are emphasizing wellness for our students, faculty, and staff. Our new Center for Well-Being is taking shape and new programming will kick off this fall as the physical space is built out in the next few months.

WPI is a dynamic ecosystem of students, faculty, staff, and collaborators tackling the greatest challenges of our time. We are deeply committed to cocreating the solutions and advancing the frontiers of discovery that impact the lives of people, and that enable the well-being of our community and our world. Such remarkable clarity of purpose is a gift.

It is my great honor to be part of the WPI community in which there is respect for each other, where we work every day to be an inclusive community that's committed to innovation that is making a difference in the world. We aspire not only to be good, but to be good for something bigger than ourselves. Let us continue to walk in this direction, together.

Cheers,
Wole

WTI

The latest in university news, research, and commendations

ILLUSTRATION BY JON KRAUSE

HOW COOKING OIL COULD BE USED TO PAINT YOUR HOUSE

In Chemical Engineering Professor **Mike Timko's** lab, things aren't always what they seem. Bamboo plants, sewage sludge, and yard and food waste are not only reused, they're made into something else entirely: fuel to power cars, trucks, and generators, and energy to heat homes.

Now Timko and other researchers have discovered a new method to turn used cooking oil into chemicals that could be made into paint or, potentially, plastic products. The discovery could help lessen reliance on petroleum and find a renewable alternative.

The innovation comes from the use of ZSM-5, a different type of catalyst than had been used in past research. The WPI team started with palmitic acid, a saturated fat common in cooking oils such as olive, soybean, sunflower, and palm oils; in other natural products such as dairy and meat; and in many skincare products.

The researchers then added the catalyst and a small amount of water to the mixture. "When you combine nano-scale catalysts and water," says Timko, "you get a sweet spot where you have a more rapid conversion and selectivity for these chemicals."

They turned up the heat—bringing the mixture to 400 degrees Celsius—and used a pressure cooker to keep the water from escaping the mixture by turning it into steam. "The pressure cooker doesn't let steam out," says Timko, "it just keeps building up pressure. When you do that, the properties of water change."

The interaction between the catalyst and the pressurized water promotes formation of industrial chemicals, known as one-ring aromatics. Other components, such as pigments, are then added to the mixture to make the paint. The next steps include evaluating the technology in a continuous process and incorporating oil that's been used in the cooking process, rather than using a model compound.

Researchers from the University of Massachusetts, Syracuse University, Zoex Corporation, and the University of Bath (United Kingdom) contributed to the study, which was partially funded by a National Science Foundation grant to Syracuse University.

—Jack Levy

ROBOTS PROVIDE HELPING HANDS TO NURSES

Inspired by healthcare needs during the COVID-19 pandemic, Assistant Professor of Robotics Engineering **Jane Li** is leading a team of researchers on a project to develop advanced remote-controlled humanoid nursing robots that can help medical workers care for patients who are in quarantine or isolation.

The researchers, who expect to begin testing a new prototype this summer, are aiming to develop a user-friendly robot that can perform nursing-related tasks in settings where a high risk of contagion or infection threatens the health of nurses.

Although medical robots are used in major hospitals today, Li says, they are difficult to learn to use and difficult to operate, which often increases nurses' workloads.

To solve this challenge, Li is continuing development of a Tele-Robotic Intelligent Nursing Assistant (TRINA), a mobile, humanoid robot that has arms equally strong and gentle to transport medications or infectious samples, help patients adjust their positions, and even lift and carry patients. TRINA was developed at Duke University in 2016; Li was a postdoctoral researcher on the project.

According to Li, TRINA could benefit patients as well as healthcare staff who are dealing with an aging American population and a persistent nursing shortage.

"I understand the heavy workloads and the stress that nurses encounter, and their fear of being exposed to infectious diseases as they care for patients," says Li, who is principal investigator on the project and director of WPI's Human-Inspired Robotics Lab. "These TRINA robots can relieve physical and emotional stress on healthcare workers. We are hoping this will revolutionize patient care, a benefit that can extend to in-home care and clinics."

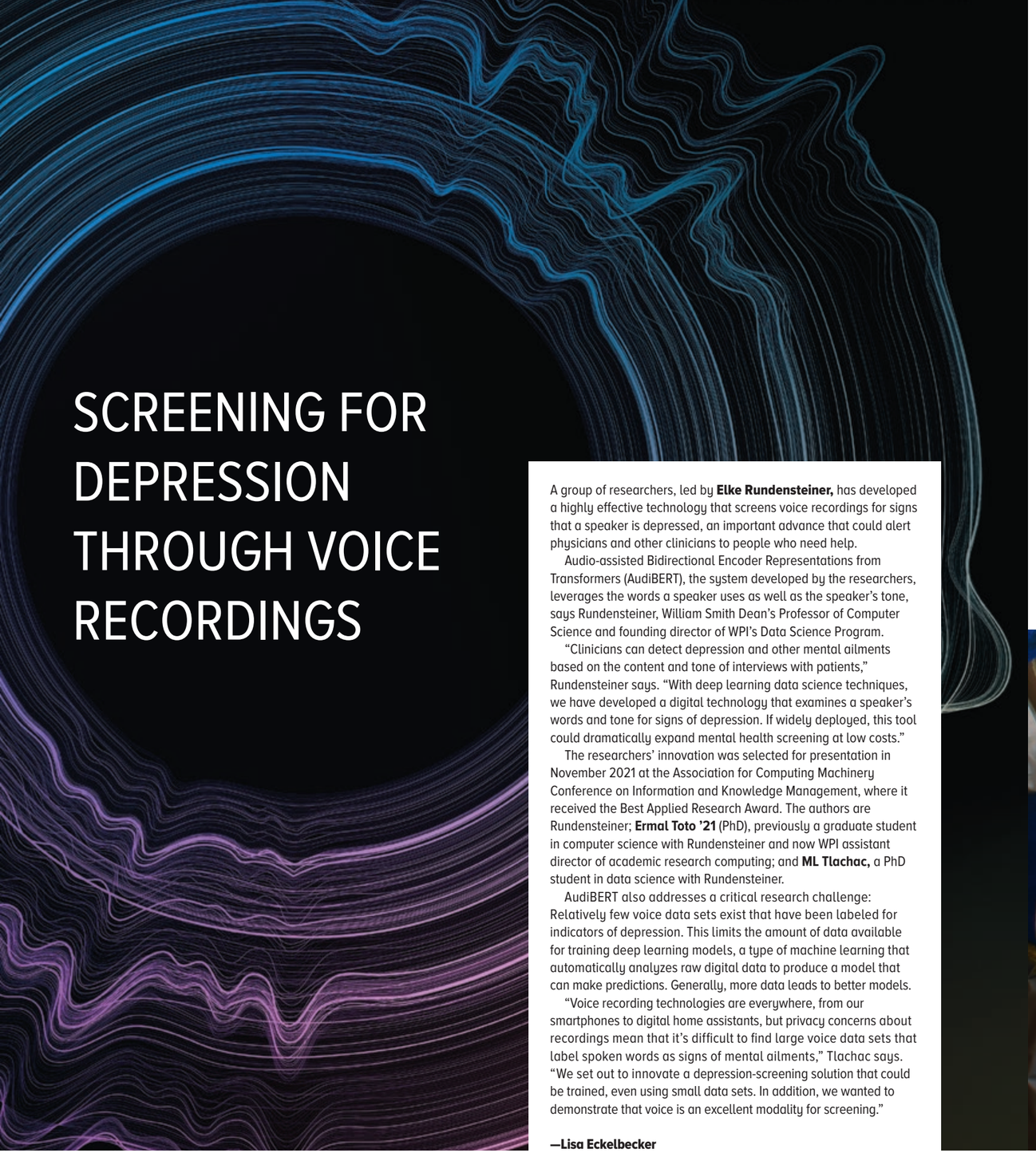
The project is funded with a three-year grant of $731,329 from the National Science Foundation in conjunction with the Centers for Disease Control and Prevention's National Institute for Occupational Safety and Health.

Li is working on another project with co-principal investigator **Cagdas Onal,** associate professor of robotics engineering and director of the WPI Soft Robotics Lab, to create haptic gloves—wearable devices that will enable the nurse operating the robot to feel what the robot senses and to better control the robot's movements. The haptic gloves will enable nurses to direct the robot's hand movements in real time.

Onal, whose research has focused on creating strong, but soft, robotics, says the haptic gloves are designed for high accuracy of mirrored movements, enabling the robot to replicate the nurse's hand gestures in real time.

"It will enable the nurses to feel as though they are doing these tasks in person," he says, "while avoiding being in potentially dangerous conditions."

—Sharon Gaudin and Lisa Eckelbecker



SCREENING FOR DEPRESSION THROUGH VOICE RECORDINGS

A group of researchers, led by **Elke Rundensteiner,** has developed a highly effective technology that screens voice recordings for signs that a speaker is depressed, an important advance that could alert physicians and other clinicians to people who need help.

Audio-assisted Bidirectional Encoder Representations from Transformers (AudiBERT), the system developed by the researchers, leverages the words a speaker uses as well as the speaker's tone, says Rundensteiner, William Smith Dean's Professor of Computer Science and founding director of WPI's Data Science Program.

"Clinicians can detect depression and other mental ailments based on the content and tone of interviews with patients," Rundensteiner says. "With deep learning data science techniques, we have developed a digital technology that examines a speaker's words and tone for signs of depression. If widely deployed, this tool could dramatically expand mental health screening at low costs."

The researchers' innovation was selected for presentation in November 2021 at the Association for Computing Machinery Conference on Information and Knowledge Management, where it received the Best Applied Research Award. The authors are Rundensteiner; **Ermal Toto '21** (PhD), previously a graduate student in computer science with Rundensteiner and now WPI assistant director of academic research computing; and **ML Tlachac,** a PhD student in data science with Rundensteiner.

AudiBERT also addresses a critical research challenge: Relatively few voice data sets exist that have been labeled for indicators of depression. This limits the amount of data available for training deep learning models, a type of machine learning that automatically analyzes raw digital data to produce a model that can make predictions. Generally, more data leads to better models.

"Voice recording technologies are everywhere, from our smartphones to digital home assistants, but privacy concerns about recordings mean that it's difficult to find large voice data sets that label spoken words as signs of mental ailments," Tlachac says. "We set out to innovate a depression-screening solution that could be trained, even using small data sets. In addition, we wanted to demonstrate that voice is an excellent modality for screening."

—Lisa Eckelbecker

POWERFUL MICROSCOPE TACKLES SEMICONDUCTOR CYBERSECURITY

WPI researchers led by **Fatemeh Ganji** have installed on campus a powerful microscope that is the first of its kind in New England and a critical piece of equipment in the development of a research center focused on semiconductor cybersecurity.

Ganji, assistant professor in the Department of Electrical and Computer Engineering, and other WPI researchers will use the new photon emission/laser fault injection microscope for research, teaching, and collaborations with academic and industry researchers as part of a three-year project. These microscopes use infrared light and high magnification lenses to examine semiconductors such as computer chips.

"Some U.S. semiconductor companies with global supply chains rely on foreign makers to produce electronic chips and boards that go into smartphones, computers, satellites, cars, self-driving cars, and more," Ganji says. "It's important to ensure the integrity of those devices as they move through supply chains. With this microscope, we can inspect electronic chips at the level of individual transistors, which enables research into how the industry can secure and safeguard semiconductors from malicious tampering, counterfeiting, and physical attacks."

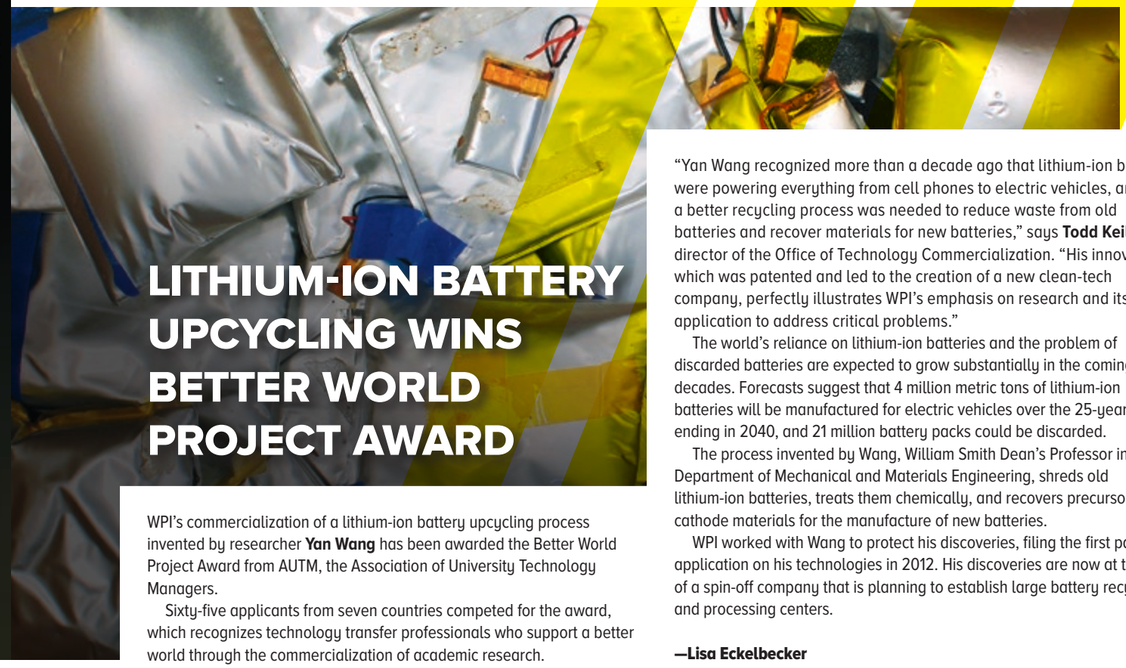
The microscope and project were funded by a $360,608 National Science Foundation grant.

WPI researchers who are collaborating on Ganji's project are Assistant Professor **Ulkuhan Guler,** Professor **Patrick Schaumont,** Professor **Berk Sunar,** and Assistant Professor **Shahin Tajik,** all of the Department of Electrical and Computer Engineering.

The microscope was installed at WPI's Vernam Lab as the university develops a new research center focused on the security of semiconductors and hardware that are critical to key innovation industries. WPI has been awarded nearly $1 million by the state to acquire additional equipment for the center.

The team has reached out to potential research collaborators through annual industry-academic New England Hardware Security events co-organized by WPI. In addition, the researchers are developing a new WPI course for students who will be working with the microscope.

—Lisa Eckelbecker



LITHIUM-ION BATTERY UPCYCLING WINS BETTER WORLD PROJECT AWARD

WPI's commercialization of a lithium-ion battery upcycling process invented by researcher **Yan Wang** has been awarded the Better World Project Award from AUTM, the Association of University Technology Managers.

Sixty-five applicants from seven countries competed for the award, which recognizes technology transfer professionals who support a better world through the commercialization of academic research.

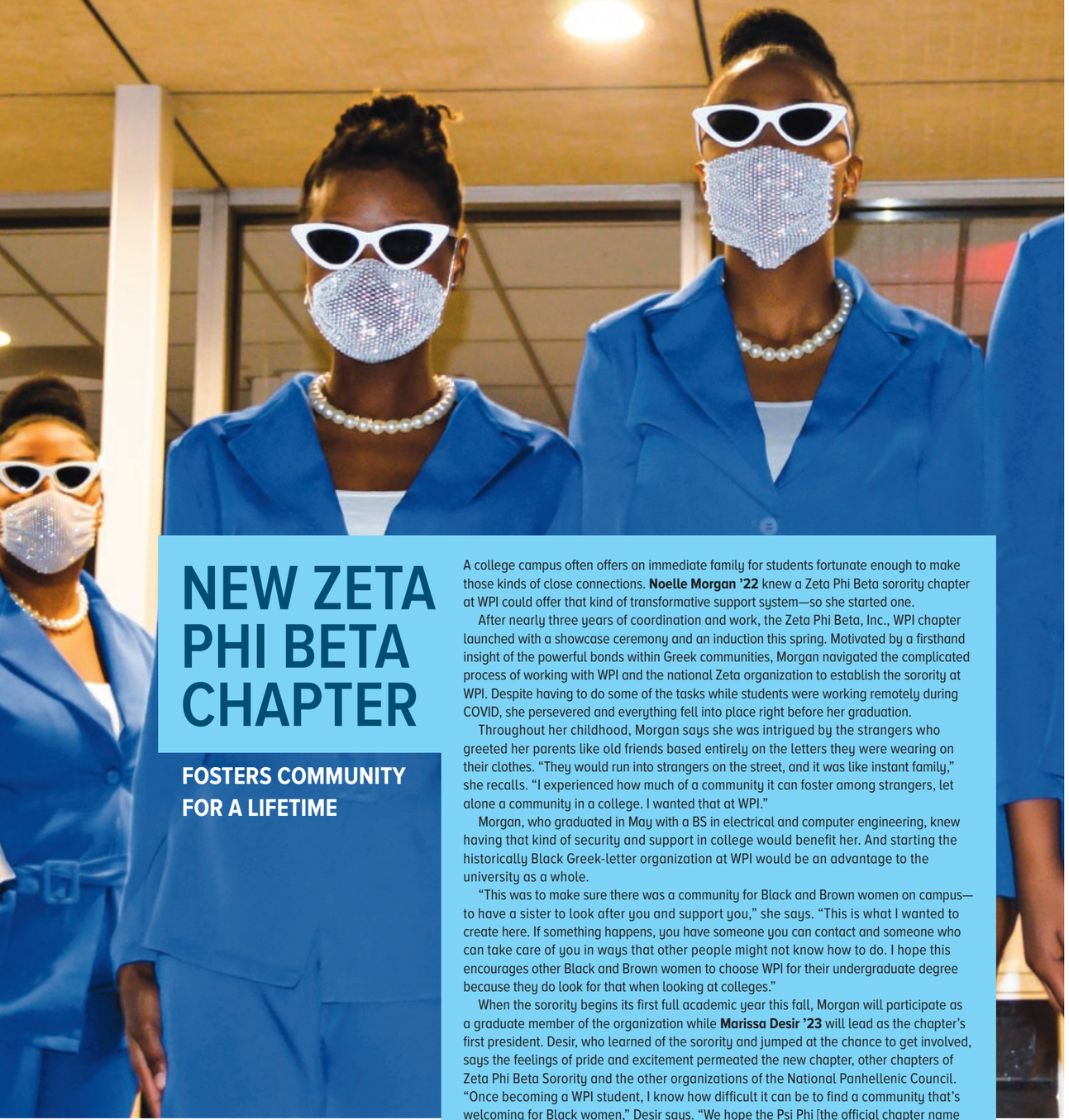
"Yan Wang recognized more than a decade ago that lithium-ion batteries were powering everything from cell phones to electric vehicles, and that a better recycling process was needed to reduce waste from old batteries and recover materials for new batteries," says **Todd Keiller,** director of the Office of Technology Commercialization. "His innovation, which was patented and led to the creation of a new clean-tech company, perfectly illustrates WPI's emphasis on research and its application to address critical problems."

The world's reliance on lithium-ion batteries and the problem of discarded batteries are expected to grow substantially in the coming decades. Forecasts suggest that 4 million metric tons of lithium-ion batteries will be manufactured for electric vehicles over the 25-year period ending in 2040, and 21 million battery packs could be discarded.

The process invented by Wang, William Smith Dean's Professor in WPI's Department of Mechanical and Materials Engineering, shreds old lithium-ion batteries, treats them chemically, and recovers precursor and cathode materials for the manufacture of new batteries.

WPI worked with Wang to protect his discoveries, filing the first patent application on his technologies in 2012. His discoveries are now at the core of a spin-off company that is planning to establish large battery recycling and processing centers.

—Lisa Eckelbecker



NEW ZETA PHI BETA CHAPTER

FOSTERS COMMUNITY FOR A LIFETIME

A college campus often offers an immediate family for students fortunate enough to make those kinds of close connections. **Noelle Morgan '22** knew a Zeta Phi Beta sorority chapter at WPI could offer that kind of transformative support system—so she started one.

After nearly three years of coordination and work, the Zeta Phi Beta, Inc., WPI chapter launched with a showcase ceremony and an induction this spring. Motivated by a firsthand insight of the powerful bonds within Greek communities, Morgan navigated the complicated process of working with WPI and the national Zeta organization to establish the sorority at WPI. Despite having to do some of the tasks while students were working remotely during COVID, she persevered and everything fell into place right before her graduation.

Throughout her childhood, Morgan says she was intrigued by the strangers who greeted her parents like old friends based entirely on the letters they were wearing on their clothes. "They would run into strangers on the street, and it was like instant family," she recalls. "I experienced how much of a community it can foster among strangers, let alone a community in a college. I wanted that at WPI."

Morgan, who graduated in May with a BS in electrical and computer engineering, knew having that kind of security and support in college would benefit her. And starting the historically Black Greek-letter organization at WPI would be an advantage to the university as a whole.

"This was to make sure there was a community for Black and Brown women on campus—to have a sister to look after you and support you," she says. "This is what I wanted to create here. If something happens, you have someone you can contact and someone who can take care of you in ways that other people might not know how to do. I hope this encourages other Black and Brown women to choose WPI for their undergraduate degree because they do look for that when looking at colleges."

When the sorority begins its first full academic year this fall, Morgan will participate as a graduate member of the organization while **Marissa Desir '23** will lead as the chapter's first president. Desir, who learned of the sorority and jumped at the chance to get involved, says the feelings of pride and excitement permeated the new chapter, other chapters of Zeta Phi Beta Sorority and the other organizations of the National Panhellenic Council. "Once becoming a WPI student, I know how difficult it can be to find a community that's welcoming for Black women," Desir says. "We hope the Psi Phi [the official chapter name given by the national Zeta organization] chapter can cater to members who yearn to express their true selves and uniqueness."

—Allison Racicot

STANDING, FROM LEFT: MELISSA BAZAKAS-CHAMBERLAIN, ALEXANDRA HELINE, LOGAN RINALDI, EMILY ADAMS, AND ASHLEY SCHULIGER. FRONT ROW, FROM LEFT: MEGAN TUPAJ, CAITLIN KEAN, LILLY EARLEY, AND MAREN CORK.

NATIONAL CHAMPIONS!

Women's Varsity Eight Rowers Capture Second NCAA Championship in WPI History

The women's varsity eight rowers etched their names in WPI history by capturing the university's first women's NCAA championship. The boat of Melissa Bazakas-Chamberlain, Alexandra Heline, Megan Tupaj, Caitlin Kean, Lilly Earley, Maren Cork, Emily Adams, Ashley Schuliger, and coxswain Logan Rinaldi dominated the NCAA Division III 2,000-meter championship race, leading from start to finish. They join Eric Meerbach '87 (1986 NCAA Division III Men's Golf) as the only NCAA champions in WPI history.

"It's a Cinderella story," says WPI Hall of Fame coach **Jason Steele**. "The foundation was laid years ago—there are a lot of seniors in that boat who worked very, very hard over a long period of time. The most important thing was that in the pursuit of believing they could do it, they actually started to really believe it."

WPI and Ithaca battled for the early lead, with the Engineers holding just a 0.186 second edge at 500 meters. The middle 1,000 meters was the difference as WPI bested the rest of the field by over two seconds from the 500-meter mark to the 1,500-meter buoys and sprinted home to the finish line in a time of 6:55.265.

WPI's varsity eight and second varsity eight boats also traveled to London to compete in the Women's Henley Regatta in June.

—Rusty Eggen

THREE WPI SPRING ATHLETES WIN NCAA AWARD FOR HIGHEST GPA

Three senior student-athletes were recognized for their 4.0 grade-point averages, winning the NCAA Elite 90 Award in their respective sport: (Pictured above, from left) Lindsay Ambrosino, softball; Ashley Schuliger, women's rowing; and Katherine Pawlak, track and field. The honor is presented to the student-athlete with the highest cumulative grade point average participating at the final site of each of the NCAA's 90 championships.

Only two other WPI student-athletes have won the award: Tim Petri of men's swimming and diving in 2017 and Sarah St. Pierre of women's rowing in 2019.

Ambrosino was announced as the award winner for the NCAA Softball Tournament Championship prior to the first pitch at Moyer Park in Salem, Va. The shortstop is an electrical and computer engineering and biomedical engineering double major. WPI earned a spot in the championship final for the first time in program history after besting Tufts in the Worcester Super Regional.

Schuliger, a computer science major with a minor in data science, was honored at the NCAA Division III Rowing Championships held at Nathan Benderson Park in Sarasota, Fla. (See related story.)

Pawlak, a mechanical engineering major with a minor in robotics engineering, took the podium for the women's track and field NCAA Elite 90 award at SPIRE Institute in Geneva, Ohio.

—Rusty Eggen

PHOTO BY [illegible]

LEAVING A MARK

Former President Laurie Leshin's legacy at WPI will live on in more ways than one. An event in May revealed the new name of the Project Center building as the Laurie A. Leshin Global Project Center in recognition of her tireless efforts to expand WPI's status as a global leader in project-based education.

NEW EXECUTIVE PHD PROGRAM LAUNCHES

The Business School launched an executive PhD program specifically designed to give executives greater influence on the challenges and opportunities in their industries, combining their life experiences with rigorous academic research to effect change, particularly in support of social justice and diversity, equity, and inclusion initiatives.

"The Business School continually aspires to meet the needs of today's highly dynamic world, in which social justice and diversity continue to emerge as critical factors in a company's vision," says **Debora Jackson,** dean of The Business School. "The Executive PhD program will ensure that leadership professionals have the critical skills necessary to make meaningful contributions in the ever-changing global business landscape."

The program helps experienced executives advance their own careers, become thought leaders, and make scholarly contributions through which they can have a greater impact on their fields. The executives' research can also benefit junior colleagues by giving them another tool to increase their occupational knowledge and help grow their careers. The first classes for the new PhD will be held in fall 2022 and students will be able to choose one of three concentrations—Entrepreneurship, Information Technology, or Operations Management.

The program is geared toward senior leaders in an organization, such as those in the C-suite or adjacent to it, who have at least 15 years of experience; it is designed in a way that allows students to remain in their current professional roles while working toward their PhD.

"The Executive PhD program can help executives be a force of positivity and support social justice goals. Executives interested in this program are not participating because they want another degree, they're participating because they want to make the world better in some way, and this program can provide a mechanism for giving back," says Business School Professor and Department Head Diane Strong.

—Jack Levy

WPI'S STRATEGIC PLAN: YEAR 1 PROGRESS REPORT

The university wrapped up its first year of implementation of Lead With Purpose: The Strategic Plan for WPI. Cross-functional implementation teams made significant progress in support of the key initiatives in each of the three strategic plan goal areas:

- **Student Well-Being, Access, and Affordability:** Creation of the WPI Center for Well-Being, which will integrate campus-wide resources and programming to foster an environment of wellness for students, faculty, and staff; launch of an internal study to better understand and improve the Black student experience; and deployment of new financial aid practices to better align aid funding with our strategic values.
- **Purpose-Driven Education and Research:** Launch of the Office of Research Integrity and Compliance, which will support WPI's commitment to scientific and ethical integrity; and pilot an initiative in stackable credentials, short courses focused on skill-building in areas of workforce demand.
- **Our Inclusive Community:** Progression of the Sustainable Inclusive Excellence Action Plan, including a website for individual divisions and schools to share their commitments and efforts as they work to advance diversity, equity, inclusion, and racial justice goals at WPI and within STEM; revamp of enrollment deposit and initial fee practices and creation of on-demand video tutorials to help students navigate FAFSA; and formation of a staff council to expand the voice of staff in steering the university.

For more information and other accomplishments, including a Year 1 report card, visit *wpi.edu/+leadwithpurpose.*

—Jessica Grimes

THE GUARDIANS OF FILM

STUDENTS PRESERVE AND OPERATE TWO VINTAGE FILM PROJECTORS FOR 'MOVIE-VIEWING PERFECTION'

High up in the cramped projection booth that services Upper Perreault Hall in Fuller Labs lives an echo of the movie industry's past: two vintage Norelco DP70 (AAII) film projectors built in the 1950s and donated to WPI by National Amusement Inc. in 1990. The fully functioning analog film projectors—one of only four sets still operating in the state—are lovingly maintained and run by members of Lens and Lights (LNL), the 60-year-old student-run group best known as the audio/visual experts on campus.

The students view their mission to operate and preserve the projectors—and the craft of the projectionist—with pride. Former Head Projectionist Kyle Mikolajczyk '22 says he and his compatriots feel a deep responsibility for passing on the specialized knowledge they learned from previous generations of students so the WPI community can continue to experience movies in what they consider the optimal format.

"There is a lot of pride in learning a skill that only a few people still know how to do," says Mikolajczyk, who joined LNL as a first-year student without any previous knowledge or experience. "We also share an appreciation for what we see as movie-viewing perfection."

The projectors, which can show both 35mm and higher resolution 70mm films, always come in pairs. Only 40 minutes of film can fit onto one giant reel, so about a third of the way into an average two-hour movie, the projectionist must start the second machine at exactly the right time for the transition to go unnoticed by the viewing audience, a maneuver known as the changeover. Then, in the darkness of the projection booth, the first machine must be reloaded with the next reel to be started 40 minutes later.

"There's a real art to it, and a little bit of stress, to get it right," says Mikolajczyk. In club meetings, LNL members often stage practice races to see who can thread the machines the fastest. Since films are transported from distributors in smaller 20-minute reels, members also must master the ability to inspect and splice the celluloid strips together to form the larger reels before showtime, and then deconstruct them after the show so they can be returned to the distributor.

There's a homemade operator's manual and some YouTube videos students can reference in a pinch. But often a shoutout to a forum of LNL students, alumni, and other film projector aficionados will solve problems quickly.

A Guardian Angel

Because the equipment is old and obsolete, repairs can be costly and parts difficult to find. LNL keeps a third projector in storage that can be cannibalized for parts, and club members often do their own maintenance and minor repair work. But sometimes the students need professional help, such as when the lamphouses and arc lamps had to be replaced recently—an expensive and dangerous task that requires skilled expertise.

Luckily, the group has a guardian angel of sorts in Chapin Cutler, an original LNL member who went on to found Boston Light & Sound (BL&S), a 40-year-old company known nationally as technical experts for the film industry.

Cutler, whose father was a graduate of the Class of 1937, started his educational journey at WPI in 1962, but found the lure of Worcester's movie theaters to be irresistible. "I was all over the town as a projectionist—you had to be 21 to get a license and I was still a teenager, so I was learning all I could. I was far more interested in hanging around projection rooms than doing my homework."

He ended up transferring and received a degree from Emerson College, which fit his artistic passions better, as well as a second degree from Wentworth Institute of Technology. In 1977, he and Larry Shaw founded BL&S to perfect a way to show high-quality projections of on-location film dailies.

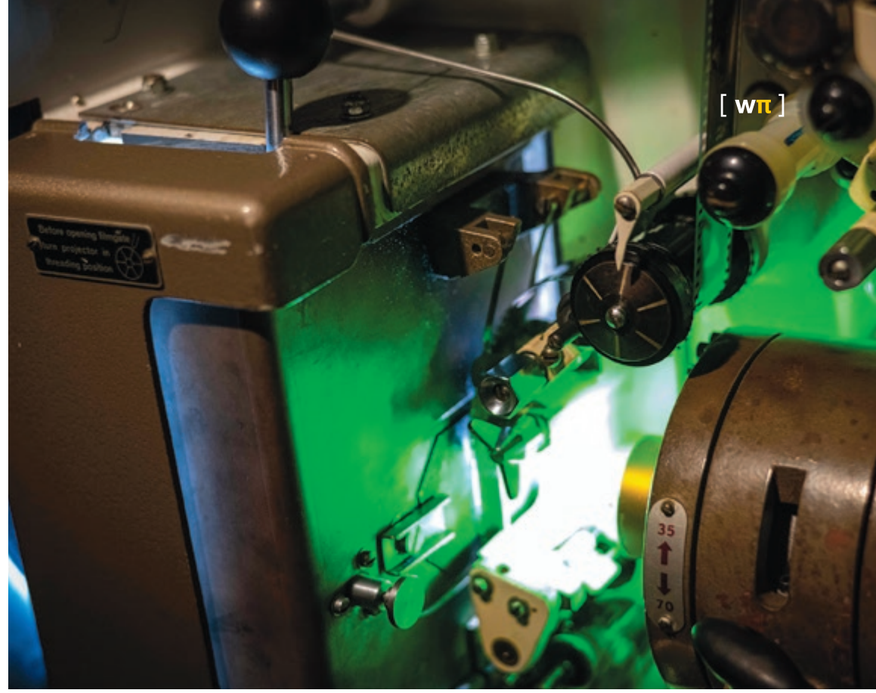
Although LNL will hire technicians from BL&S for major repairs, club members often attend these service calls so they can ask questions and learn more from the masters.

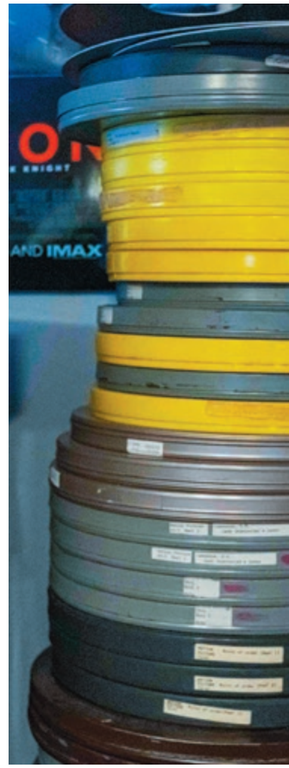
LNL also operates a digital projector, now the industry standard, out of the same projection booth. But purists say film's contrast and resolution is far superior to modern digital technology. And in a world where most people watch movies in a home theater, it's also a throwback to the spectacle of the movie theater days.

"When I started in the business in the 1960s, movies were run in palaces, or single screen theaters, and there was a sense of showmanship that went into the way that shows were presented," says Cutler. "What LNL is doing, in its own way, is keeping that showmanship alive. It's become one of my passions, and my company's passion, to pass on those things that we have learned. To me, I'm keeping alive part of what those old Irish guys who came out of the silent film days taught me as an 18-to-20-year-old in those Worcester movie theaters."

—Kristen O'Reilly

PHOTOS BY MATTHEW BURGOS





INSIDER

TESSA LYTLE '23 JUGGLES COMPETITIVE SKATING WITH CHALLENGING ACADEMICS

PHOTO BY MATTHEW BURGOS

Balancing an elite sport while looking for a college is tough, but narrowing your parameters to include an engineering school and a niche sport like synchronized skating? Meticulous investigating and planning are only the beginning—you then have to get into both places.

For **Tessa Lytle '23,** both specialties had to be on the table. So when she found the academics she wanted at WPI and the competitive skating at the Lexington, Mass.-based Hayden-Synchro School, everything started to fall into place.

After simultaneously applying to WPI and trying out for the Haydenettes, an elite-level synchronized skating team that trains at the Skating Club of Boston in Norwood, Mass., Lytle was accepted by both. "I didn't know I wanted to study engineering until my junior year of high school," says Lytle, but she had been a national competitor in the sport of synchronized skating for years. Now she's making the best of both opportunities.

Lytle says WPI's project-based education appeals to the way she learns and how she prefers to work. At WPI, she's in the BS/MS program to earn both mechanical engineering degrees in four years, and she's also on the executive board of several campus clubs and organizations including as president of the WPI chapter of Engineers Without Borders.

Always Skating

An Idaho native, Lytle didn't connect with skating until her family moved to New York City and lived near the Bryant Park skating rink. "My mom bought us all skates, and from my window, I could see if there was a line and just head over," she says.

Calling her early approach to skating a "skate fast and fall a lot" method, Lytle's knees frequently sported therapeutic ice after even a short time on the rink. At first, Lytle began with freestyle skating, which includes attention-getting jumps and spins. "Those are challenging mentally," she says, "but I liked the skating skills it required."

She was drawn to the grace of other skating styles, particularly the rhythms of skating with a large team moving as one. "I get the consistency of it, and there's something very calming about it," she says. Focused choreography and frequent practice ensure the skaters all move together for visual effect and safety, as one off-kilter move could impact everyone. "When you're so close together, you can't be worried about hitting each other," she says.

As a competitive skater, Lytle maintains a precise training and performance schedule with the Haydenettes around all of her courses and projects. Despite the high-intensity academic and skating workloads, Lytle says each provides excellent balance to the other. "Skating can be a cause of stress, but it's also a huge distraction," she says. "When I am on the ice, I can't think about school because there are 20 other people out there I don't want to run into."

Managing a Complicated Schedule

The balancing act that Lytle has managed to maintain has worked out for the most part, mostly because of her fierce determination to do it all. It's a schedule that would make most people cower. After an hour drive to the Skating Club of Boston rink, Lytle hits the ice by 6:30 a.m. four days a week. After practice and required ballet and fitness training, she's back on campus around noon. One day a week, practice is in the afternoon. In the early days, it took some complex maneuvering to successfully dovetail a course schedule and a training and competition schedule. "It was high pressure, but gave me an opportunity to do well," she says.

Now, her higher level courses offer more flexibility and a level of learning she appreciates. "Mechanical engineering is so broad," she says, "that if I veer off in one direction, I am still within my field."

In her Intro to Engineering Design course (ME2300), she worked with a five-person team to create, and eventually race, an autonomously driven radio-controlled car. Whether her team was designing the car's components or working on sensor software—or anything in between—they overcame challenges to race the car. The thrill of success was real, she says. Her Interactive Qualifying Project related to climate change and national parks and she is eagerly anticipating her MQP, which will involve 3D-printed humanoid robotics.

Her advisor, mechanical engineering professor Pradeep Radhakrishnan, guides her focus so it is on professional understanding, not just a high letter grade (and he has even attended some of her competitions).

Remote Work and Resilience

When COVID caused many of Lytle's foundation courses to go remote, she missed some important aspects of her education. "Taking fundamental engineering courses online didn't give me the hands-on experience that's expected of you. When I came back in person for my higher-level courses, I was missing some basic tooling and soldering skills that you were expected to already have. There was a clear gap in user knowledge due to online courses and the pandemic," she says. But with WPI's open access to labs and a little help from a friend, Lytle caught up on the tools and processes she needed to know.

Even though some of the learning was intimidating, the individual mechatronics lab work was freeing. "I could tear something apart, put it together, not have it work, and there was no one looking over my shoulder to see it," she says, noting reassembling a bathroom scale was especially difficult.

Throughout the challenges of skating and academics, Lytle has found her groove. "I am a very high-achieving person," she says, "and I'm very competitive. But I try to be more carefree and realize not everything is going to work out." Lytle says she no longer feels she has to ace every single course or lead each student organization she's in. "I'm figuring out what really matters," she says.

Spontaneity, although hard to come by, offers perspective while her community offers support. "One night, I was in a meeting and we got out at 8 p.m.," she says. "I had hours of work ahead of me, and I needed to get to sleep on time. But one of my friends said, 'Hey, let's go get bubble tea.'" It threw her schedule out of whack, but she went—and her friends noticed. "They said to me, 'Tessa, your time is so valuable, and we appreciate you coming out with us.' I got home and I thought, 'That was definitely worth it.'"

As Lytle considers her future—including skating and possibly WPI's PhD program—she knows both passions will be part of her routine. "I am OK to throw some stuff out there and see where it lands," she says. "I am OK with some stuff not working out. I am someone who does a little bit of everything. When it works out, I can focus in on that thing. When something changes, I have a lot of other things I am interested in." And those interests will guide her to a meaningful life after WPI. "I want to be the person to make things happen," she says. "I don't want to be the observer."

—Julia Quinn-Szcesuil

Q&A

LAUREN TURNER, PHD, JOINED WPI AS SENIOR VICE PRESIDENT OF TALENT & INCLUSION AND CHIEF DIVERSITY OFFICER IN JANUARY 2022.

What excites you about this role at WPI?
When I came to campus for my interview, I was excited by all the people I met. I love that WPI is a STEM school that cares deeply about making a positive difference in the world. WPI prepares graduates to be better civic contributors and better employees because they learn human skills, like how to work with people, how to communicate, and how to collaborate. It's a values-based way of teaching STEM. I was also excited because I learned early on about WPI's strategic plan and how it is bookended by two pillars based in equity: access and inclusiveness.

The fact that talent, inclusion, people, and culture are included in this position excited me as well. When we're talking about DEI, we're talking about representation, which should be reflective of the available labor force and available pool of prospective students from which we are drawing. When you bring people together, they need to have experiences where they can engage fully, build respectful relationships, truly feel a sense of belonging, and be successful.

Shortly after you started at WPI, President Laurie Leshin told you she was leaving. How are you supporting the presidential search process?
Laurie told me on my third day that she would be leaving WPI. But organizations change and leaders change—it's what happens at every institution. I pretty quickly pivoted to, "What's the plan for transition?" She asked me to work closely with Trustee David LaPre '76, chair of the Presidential Search Committee, and it's been a great experience so far. We're working to facilitate a process that's inclusive, and I'm confident we will attract a great pool of candidates from which to select WPI's next leader. As we were creating a specifications document, we held dozens of listening sessions that included many WPI stakeholders—faculty, staff, students, parents, alumni, and trustees. I learned so much about WPI through these sessions, things that normally could have taken me years to learn. It's been a lot of work, but it's given me a great perspective.

Your PhD dissertation focused on diversity management practices. Why is this subject so important to you?
I earned my PhD late in my career, in 2018, and that work has informed my practice. But in a lot of respects, my practice informed my PhD work and dissertation. What I found in my research was that chief human resources officers who have higher levels of cultural intelligence are more likely to support the establishment of diversity and inclusion practices at their institutions. They also are more likely to engage in transformational leadership behaviors that influence other institutional decision makers around DEI. That's really the essence of why I got into this business 40 years ago.

What might people be surprised to learn about you?
Sometimes people are surprised when I talk about how strongly I feel that every lever matters when it comes to DEI, and that we need to be thinking about DEI every single time we make a decision so we can create a better, stronger, more inclusive, and more engaged community.

On the personal side, I am the fifth of seven children and my family often struggled financially. My parents didn't have the opportunity to go to college—in fact my dad didn't finish high school—but they understood the value of education, so much so that when I married my husband at age 18, I made a commitment to them that I would go to college.

I began working at Mount Holyoke College in the 1980s as a receptionist in the Office of Personnel Services; I earned my undergraduate and master's degrees as I moved up the career ladder of the human resources business. I moved to UMass Lowell in 2011 and pursued my doctoral degree while serving as senior associate vice chancellor for HR. I received my PhD in 2018, just six months before my dad passed away, but he was there to witness what for me (and him) was an important life accomplishment. My husband and I have been married for 42 years; we have two daughters, ages 35 and 33, one grandson, age 4, and another one on the way.

PHOTO: [illegible]

ILLUSTRATION BY JONATHAN D. REINFURT

GLOBAL IMPACT

A GLOBAL EXPERIENCE: NO PLANE REQUIRED

Since its inception in 2000, the Worcester Community Project Center (WCPC) has given students the opportunity to complete hundreds of projects, from creating a data collection tool for Habitat for Humanity and building an app for a directory of substance use and homelessness resources to developing adapted, custom-crafted weaving looms for refugee artisans from Bhutan and Nepal. Now, more than 20 years later, the center is tackling something new: giving students a global experience in a local context through the Local Latino Projects Program.

"I firmly believe that WPI students can have a global experience without ever stepping on a plane," says Aarti Smith Madan, associate professor of Spanish and international studies. "This experience has the potential to change how they view not only [the local Latino] communities but also themselves and the United States."

The idea for the Local Latino Projects Program came about in 2020, after WPI's Latin American & Caribbean Studies group earned a six-figure grant from the U.S. Department of Education to build out its undergraduate curriculum, which included a focus on deepening inroads into Worcester's Latino community. Madan used her past role as chair of the Community Impact Committee of the United Way Women's Initiative to connect with local Latino-facing organizations to assess their needs and interest in working with WPI students, simultaneously giving students the chance to meet academic project requirements, whether through project work or in pursuit of a minor in Latin American & Caribbean Studies.

Madan shared her findings of interested organizations with WPI stakeholders and quickly connected with WCPC Director Laura Roberts. Rather than build an entirely new project center, they agreed to house the first two projects (collaborations with the Latino Education Institute and El Buen Samaritano) under the WCPC umbrella.

In addition to Madan's hopes that the project work will help students "come to appreciate Worcester as a global city of immigrants," Roberts adds, "I hope they gain a sense of agency and responsibility to use their time and talents to benefit the local community and that they will go on to be more community and civically engaged in their lives beyond WPI."

If the experiences of students who worked with El Buen Samaritano—a nonprofit food pantry that has also provided clothing, housing support, translation services, immigration assistance, and other services since 1991—are anything to go by, they're doing exactly that. Chris Cook, Janie Leung, Olivia Rockrohr, and Caleb Talley, all members of the Class of 2023, worked together to design a digital system to improve the organization's inventory system to minimize redundancy and better record and analyze data so they could expand their services.

All four students cited the desire to get to know the Worcester community better as their primary reason for completing a project at WCPC; Rockrohr, however, sums it up best: "The whole experience made me feel more like I was part of the Worcester community instead of a student just attending WPI."

The team members immersed themselves in working with El Buen Samaritano, completing their project work as well as assisting with the organization's weekly food pickup and distribution. It made for an engaging, multifaceted experience, and one where even the smallest interactions had the potential to become the most memorable.

Cook, for instance, recalls that his favorite memory of working with El Buen Samaritano came from one of those pickup and distribution trips. "One day, when driving back from the Worcester County Food Bank, I had a conversation in Spanish with one of the workers about life," he says, explaining that his work through the WCPC allowed him to improve his confidence in speaking Spanish, something he plans to continue to utilize after graduation. "It was just a really nice experience."

—Allison Racicot

THE ARCHIVIST

Metallurgist Elwood Haynes Changed the Way We Travel

The oldest member of the WPI Class of 1881, Elwood Haynes was noted by his classmates for his serious demeanor and for always being in a hurry. He was consistently frustrated by the rusty blades of cutting utensils and, while a student, he began to experiment with new alloys. In the 1881 yearbook's Class Memories, his classmates noted that he was a "manufacturer of tungsten steel." After graduation, he took graduate courses and taught chemistry classes before moving to Muncie, Ind., where a large natural gas deposit had recently been discovered.

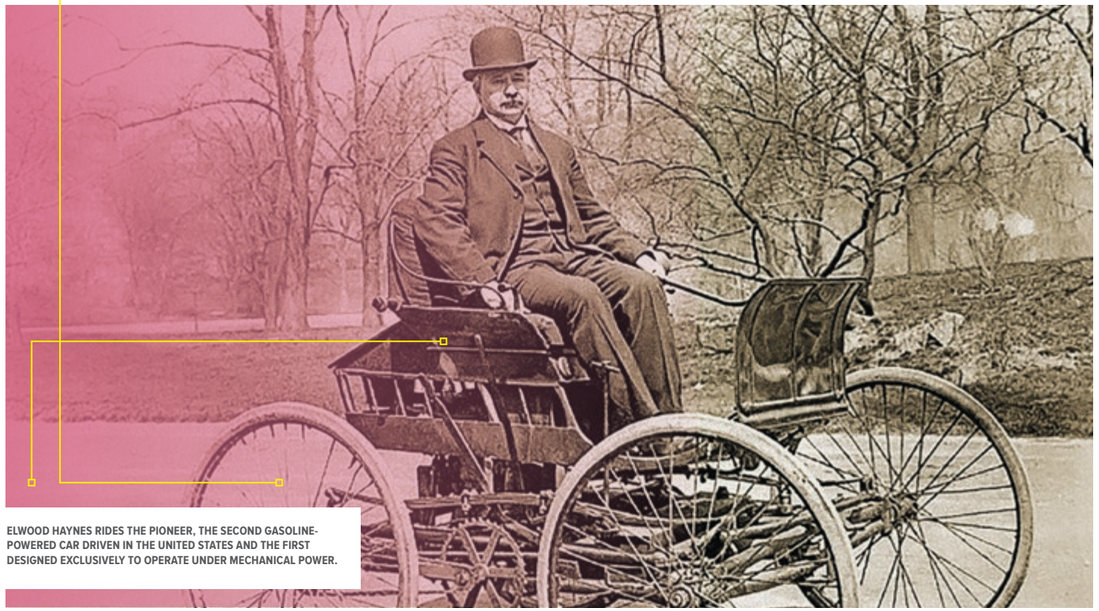
Haynes championed the use of natural gas to heat homes and businesses, and in 1886 he was named superintendent of Portland Natural Gas and Oil. Tasked with overseeing the construction of a 10-mile pipeline, he conceived of a mechanical-powered buggy that could traverse the rough and sandy roads better than a horse could.

His early automotive designs included furnace- and electric-powered engines to no success. At the 1893 World's Fair, he saw a demonstration of a gasoline-powered engine and ordered one for his experimental design. He first drove his experimental car, The Pioneer, on July 4, 1894; it was the second gasoline-powered car driven in the United States and the first designed exclusively to operate under mechanical power. Haynes continued to experiment with rust-proof alloys for his automobiles and found that adding aluminum to his crankcases helped deaden engine-noise vibrations.

By the time of his death in 1925, he was recognized as an influential metallurgist, automotive pioneer, and renowned inventor. The Haynes Car Company was the first viable automobile manufacturer in the United States; Haynes was named a member of the 75th class of the Automotive Hall of Fame in 2015.

His creation stellite, a cobalt-chromium alloy, is still used on spacecraft for its ability to withstand high temperatures. A noted philanthropist, Haynes was also passionately opposed to white supremacy groups, which were growing in influence during his lifetime.

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



ELWOOD HAYNES RIDES THE PIONEER, THE SECOND GASOLINE-POWERED CAR DRIVEN IN THE UNITED STATES AND THE FIRST DESIGNED EXCLUSIVELY TO OPERATE UNDER MECHANICAL POWER.

See how WPI students put theory into practice through projects.

PROJECTS

VALIDATING 3D FOOD PRINTING FOR CUSTOMIZABLE NUTRITION

THE STUDENTS: Leslie Mateo '22 and Emily Toala '22

THE ADVISORS: Danielle Cote, Angela Rodriguez

THE SPONSOR: U.S. Army Combat Capabilities Development Command Soldier Center

THE PROBLEM:

The United States military currently relies primarily on Meals Ready-to-Eat (MREs) to sustain its personnel in the field. However, acceptance of MREs is low, especially over extended periods of time. One study found that after just three weeks of consuming MREs, users would discard 40 percent of the meal. This scale of food waste not only is fiscally inefficient, it means users are lacking in necessary nutrients and do not consume enough calories. A lack of proper nutrients and inadequate calorie intake can lead to weight loss and decreased energy, as well as other health issues.

THE CHALLENGE:

This project aimed to advance the material science of 3D food printing and integrate it with consumer rating studies through developing a three-layer, nutritional, palatable 3D food printed (3DFP) bar. In this process, structures are built layer by layer from a computational 3D model. Food inks (recipes) are added to an extruder, pushed out by an external source of power (air pressure unit), and then printed into a pre-designed shape.

THE RESEARCH PROCESS:

The research team developed a feedstock formulation for a three-layer bar and optimized printing parameters to produce high-quality prints. The base layer consisted primarily of oats and nuts; the middle layer was mostly cinnamon applesauce and honey; and the final layer included dark chocolate for embellishment, similar to what is used on commercially available nutrition bars.

Both printing and post-processing parameters were modified to alter the interior structure of the bar to change its texture. Mechanical testing was performed to determine the relationship between the texture and mechanical strength of the bar. The mechanical tests coupled with a taste test allowed for a viability evaluation.

THE RESULTS:

Aggregate results demonstrated that the bar is viable at certain temperature ranges. Overall, these results support the suitability of the bar formulation and printing parameters for further development and scaling. Compared to other food manufacturing techniques, 3D food printing has several advantages: It's easily customizable for taste and nutritional needs, unlike manufactured foods that are mass-produced. Customization reduces waste. 3DFP uses raw materials to produce a final product, reducing costs by eliminating need for a commercial manufacturer, in addition to reducing labor and shipping costs.

THE FUTURE:

The project focused on infill density and infill pattern, but many parameters not in the scope of the project would give more valuable information. Further exploratory studies might include additives, control bars, and chewing sensory tests.

Sarah Strauss

PROFESSOR OF INTEGRATIVE AND GLOBAL STUDIES, THE GLOBAL SCHOOL

CHICKEN
The domestic chicken has been suggested as the "type fossil" for the Anthropocene epoch. Humans have now impacted this planet from the bottom of the sea to the top of Everest.

PHOTO BY TODD VERLANDER

HAFLINGER HORSE
I've ridden horses since I was 6 years old, but sold my Haflinger, Jax, several years ago. Thinking about getting an Icelandic one next!

BOOKMARK
Anthropology is an "intradisciplinary" field, and anything that has to do with humans—across space and through time—is fair game for study.

TSCHAGGÄTTÄ
This mask is part of a costume tradition from the Valais region of Switzerland, where I have done fieldwork. Figures wearing such masks chase away the evil spirits of winter just before Lent.

WYOMING COAL
Less energy content than a similar piece of West Virginia coal, but also less sulfur. There are always tradeoffs. I taught at the University of Wyoming for 24 years.

GANESHA
One of my favorites! Remover of obstacles, he is the Hindu god of beginnings and of wisdom, who brings good luck to new ventures. Here, he's lounging with a laptop.

POSITIONING YOGA
This book comes from my PhD dissertation work, one of the founding texts for the field of modern yoga studies.

CHOCOLATE TIN
This comes from Fribourg, Switzerland, where I spent a sabbatical year studying climate modeling. The chocolate from Villars is wonderful and reminded me of the town where I first studied abroad as a sophomore—Blois, France.

FACULTY SNAPSHOT

Get to know faculty through items they have in their offices.

SENSE OF PLACE

A PART OF THE WPI FAMILY FOREVER

President Laurie Leshin oversaw her final Commencement exercises on May 14, the first time graduates were able to gather as a whole class for in-person ceremonies since May 2019. "I leave, as you do, with so many lessons and so much hope for the future of this great university and beyond," said Leshin, now the first female director of NASA's Jet Propulsion Lab. Then she asked the class to do her a favor: "Would it be okay if I consider myself a member of the Class of 2022?" It was a request they accepted wholeheartedly. "You and I will be part of the WPI family forever, and it is this family that makes WPI so special."

PHOTO BY MATTHEW BURGOS

A SEA CHANGE

Once an aspiring test pilot, Casey Brown ’16 pivots to building ocean-exploring drones.

BY KRISTEN O’REILLY
PHOTOGRAPHY BY JIM GENSHEIMER

PHOTO COURTESY SAILDRONE

CASEY BROWN FLEW GLIDER TOW PLANES AT STERLING AIRPORT AS A STUDENT AT WPI.

The Saildrone manufacturing facility is abuzz with activity on a balmy late-March day, its huge open doors letting in the breeze from nearby San Francisco Bay. Mechanical engineer Casey Brown '16 is giving a tour of the gigantic, historic airplane hangar at the former Naval Air Station Alameda on the banks of Seaplane Lagoon. Where 80 years ago workers assembled aircraft for the U.S. war effort, now more than 150 Saildrone employees are building uncrewed surface vehicles (USVs) designed for long-range data collection and surveillance missions in the world's vast oceans.

Two sets of 23-ft. Explorer drone fleets—the smallest of Saildrone's three USV models—are lined up like soldiers on elevated racks that expose their sleek keels. The bright orange hulls resemble oversized sea kayaks, but instead of space for human paddlers, high-tech sensors and other electronic equipment are stored under solar panel-covered hatches. The hull and keel stabilize a rotating, rigid sail—essentially an airplane wing mounted vertically—that captures wind and solar power for a carbonless, virtually limitless propulsion system. A T-shaped tail mechanism pierces the sail halfway up, the secret sauce for the USV's remote, autonomous navigation.

CEO Richard Jenkins founded Saildrone to explore ocean frontiers using technology adapted from his successful 10-year quest to set the land-speed record for a wind-powered vehicle. The company's sailing drones can, among other duties, autonomously map the ocean floor to a depth of 23,000 feet, sail through hurricanes to return data that could improve forecasting, test water quality in the Arctic Ocean, document fish migration patterns, collect carbon data while sailing the Gulf Stream, and serve as the eyes and ears of maritime law enforcement and safety officials.

Passing the small reception area, the 28-year-old Brown notes with nostalgia that this was his first shared office when he started helping design and build Saildrone's early USVs five years ago when the company had only 20 employees. "I don't get my hands dirty as much now, but I'm still learning new things and that keeps the future exciting," he says with the air of a seasoned veteran.

FLYING DREAMS

Brown's path to a job in the maritime industry was not a straight one, nor one he even imagined as a student at WPI. But he credits his well-rounded education with giving him the confidence and flexibility to pivot in an entirely different direction when he realized his dream of becoming a test pilot or flight test engineer wasn't going to, well, fly.

"That's probably the most valuable takeaway from WPI: I left college with a diverse skillset that allowed me to try something new without starting all over again," says Brown. "It was stressful and uncomfortable, and I felt lost and unsure about where I was headed. But by trusting my intuition and being willing to try something different, it ended up working out."

He caught the flying bug at age 14, taking lessons at an airport near his home in Eliot, Maine. Although he needed the height from several boat seat cushions to see out the windshield of a vintage Piper J-3 Cub—a 1940s-era plane with no electrical system or radio—it was "by far the most fun thing to fly," he says.

He soloed at 16 and received his pilot's license at 17, right before starting at WPI. He prepared for the life of a future aviator by majoring in aerospace engineering and building a solid resume of internships and flying experiences. Professor Fred Looft introduced him to the Greater Boston Soaring Club, a group of glider pilots who fly out of the Sterling Airport, just 15 minutes from campus, and Brown learned to fly the club's tow planes under the tutelage of veteran pilot Ritts Howard.

"It was a classic old-school airport without the security gates and chain link fences found at most small airports these days. It was the perfect place to complement the classroom theory with the practice of actual flight in both powered and unpowered aircraft," he says. "Being trusted by the club to tow gliders felt like a big deal, and the promise of a career in the field of aviation made all the challenges of schoolwork feel worth it."

After his sophomore year, Brown landed a gem of a summer internship, "a total dream-come-true moment," at Scaled Composites, an innovative aircraft manufacturer in the Mojave Desert. There he met actual test pilots and got a taste for what such a career might entail—both the good and the bad. "Out in the middle of the desert, it's pretty barren," says Brown, who grew up surfing and enjoying coastal life in New Hampshire and Maine. "You really have to commit to the aviation lifestyle and work your way up the ladder for that to be worth it."

AN IMPACTFUL GROUP PROJECT

When it came time for his Interactive Qualifying Project (IQP), he secured a competitive spot at the Zurich Project Center, where he bonded with Professor Jerry Schaufeld over their shared flying background. Brown's project team at NTB Interstaatliche Hochschule fur Technik (Interstate University of Technology) built a manual for constructing and operating

PHOTO COURTESY SAILDRONE

"My IQP taught me the importance of traveling and being exposed to different cultures and different ways of living. It felt so healthy to get some distance from New England and my aerospace studies and get a taste of how much else there is out there to explore."

simple heat pump fruit dryers that were sent to Burkina Faso and other African countries to help farmers preserve their fruit and get it to market.

He loved everything about the experience: the people he worked with, the humanitarian nature of the project, the ability to travel all over Europe on weekends, and—surprisingly—the break from flying.

"My IQP taught me the importance of traveling and being exposed to different cultures and different ways of living. It felt so healthy to get some distance from New England and my aerospace studies and get a taste of how much else there is out there to explore," he says.

The following summer he returned for a second internship at Scaled Composites, but as he worked toward securing his instrument rating (the next step before a commercial pilot's license), he began to realize that flying was starting to feel less like a romantic dream and more like an expensive hobby.

"When you're working on your instrument rating, you're just staring at gauges and chasing needles and making sure you can fly safely with no visibility. It was a compelling challenge, but more stressful than fun," he says. "It wasn't like flying along the coastline on a beautiful summer day in New England. This was like work. The long and uncertain ladder to a test pilot slot didn't look so appealing anymore."

To top it off, his Major Qualifying Project (MQP) didn't go as planned. The team's entry in a design-build-fly competition was unsuccessful for several reasons, he says, including an unusual design and a strategic error in waiting until too late to test the entry's flight capability. "Basically, our stuff didn't work," he says. "We learned a lot of lessons, but it was a tough experience."

As his college years came to a close, Brown experienced a profound sense of loss and uncertainty as he realized the dream job in the aviation industry, the one he had worked so hard to secure, really wasn't for him.

"All of a sudden, my MQP didn't go well, I didn't have a job lined up after graduation, I didn't really know what I wanted to do, and I'm back living with my parents. After landing my dream internship fairly early in my college career, I never expected to be back at square one after graduation," he says. "I thought, 'Wow, what just happened?'"

THE PULL OF THE WEST COAST

As Brown regrouped and plotted his next move, he focused on searching for engineering jobs in the San Francisco area, a place that—in addition to being close to the water and mountains—has a special connection to his family. His father, Nicholas Brown, is a U.S. Navy veteran who was stationed at Naval Air Station Alameda and stayed in the area after discharge. He built fiberglass and carbon fiber rowing shells, worked on tugboats in the bay, and later ended up building and restoring wooden boats. He met and married Alicen, a graphic designer; after the birth of Casey, the family moved to Portsmouth in search of coastal living with more affordable homes and a better public school system. Nicholas continued to work on wooden boats at the Strawbery Banke Museum, and he built a barn with a workshop attached to their house for additional boat work and side projects.

"I was lucky to grow up with creative parents and a workshop full of interesting projects. Whether it was fixing up vintage motorcycles, bicycles, boats, or surfboards, there was always something happening in the shop," says Casey. "It gave me a perfect space to build models, experiment with remote-controlled aircraft, and get used to working with my hands sculpting wood, foam, or fiberglass. It was an early breeding ground for liking engineering."

He sent out a flurry of emails to tech companies in the Bay area looking for any job opportunities; Danielle Applestone, founder of the consulting firm SQRLE, was one of the few who replied.

"Some of my best hires ever came from my responding to people who took a leap and really put themselves out there in a cold email. It's a vulnerable thing to do, and I really want to encourage that kind of action whenever I see it," says Applestone on why she replied.

She encouraged Brown to not settle for just any job.

"Casey had done a lot of projects on his own steam," she says. "He is a builder, not just a design-on-the-computer engineer. People who have the drive to complete work from a place of curiosity are always fantastic hires. He also had the guts to reach out to me without knowing me, and it was clear that he is a loving and empathetic person. I knew that with all those ingredients, I could introduce him to leaders in my network and he would be valuable to anyone who hired him."

One of those connections was at Saildrone, and Brown was soon on a flight out to the West Coast for an interview. The fact that the company was located on a former base where his father was once stationed—in a city where his parents first met—seemed like kismet.

Saildrone hired him as a CAD (computer-aided design) engineer, essentially a junior mechanical engineer. "The job was perfect because it involved doing a bunch of different things," he says. "They needed scrappy young engineers who were willing to do anything. And they turned me loose to learn all kinds of skills."

His welding skills, not great to begin with, improved quickly. Under the direction of a more experienced engineer, he learned a variety of manufacturing methods, such as manual machining and laying up fiberglass in molds, while also constructing infrastructure for the shop and designing and installing parts for the drones.

"I'd get to design in CAD from a notebook sketch, walk out of our little office, cut all the steel on a horizontal band saw, lay it out on the floor, and then weld it up. It was a lot of full days being on the shop floor getting my hands dirty, going back to check the CAD, and seeing my designs through to completion," he says. "It felt like a bigger version of what I'd always done with my dad in our home shop."

As an early hire, Brown wore many hats out of necessity. "We had no fit-out team, no deployment team, like we do now," he says. "I would help load the drones into shipping containers and then I'd fly out with a small team to meet them when they reached places like Australia or Alaska. We'd work with the local port to unload, assemble, and launch them for deployment. We have designated fit-out and operations teams now that we've grown so much, so I'm glad I was here early enough to get a taste of the whole process."

The newest Saildrone USV is the Voyager, a 33-foot model designed to accommodate larger and more powerful instrument payloads for deep-water mapping, surveillance, and reconnaissance for law enforcement and maritime safety officials. Nearly every component of the new model needed to be redesigned with the intent of production at scale. Other plans call for increased production of the Surveyor, a 72-foot USV that supports deep-water seafloor mapping equipment.

With so much development work in the pipeline, Brown sees continued opportunities to grow professionally. "I've always been fascinated by big ships and heavy infrastructure. With the demand for our new, more complex vehicles growing, we may need to outsource parts of the fabrication to bigger shipyards as we scale up," he says. "I would love to be part of that interface. Working on bigger projects would be exciting."

NEXT CHALLENGES

As he hit his five-year anniversary, Brown became eligible for a three-month sabbatical, a common perk in modern start-ups. In May, he returned to Europe for the first time since his IQP—he'd planned to visit his contacts at NTB (now OTS) Interstaatliche Hochschule fur Technik that he's kept in touch with over the years. After further travels to Africa and Central America, he'll return to the Alameda area rejuvenated and ready for the next challenge.

"I love Alameda, love the family history, love the maritime arena I kind of accidently found myself in. It feels great to be gaining experience as a more senior engineer," he says. "There's still so much to learn about tackling a design problem in the most efficient way."

He's also eager to further explore his passion for surfing, both traditional and kiteboarding. He has built several surfboards—one as a pandemic project—and he's excited to tap the knowledge of some of the former surfboard builders that have been recruited to Saildrone as the company scales up production.

"One of the coolest things about working for a company that's ocean-focused and environmentally conscious is it seems to attract a great blend of people that have shared interests relating to the work," Brown says. "A few of these people happen to be high-level surfboard shapers who are happy to share their board design knowledge and tricks for building them. I never thought that I'd become good friends with local surfers and shapers through an engineering job, but it turns out we both want to learn from each other's backgrounds. It's given me a growing appreciation for how widely applicable engineering skills are."

Whether it was fate or happenstance, Brown appreciates his good fortune at finding his current place in the world.

"After being mostly uninterested in boats and sailing growing up, I now find myself working in a boatbuilding facility surrounded by sailors, working on the Naval Air Station where my dad was based when he was my age, often kiteboarding the same beach where he used to windsurf, which is also where my mom and dad first met," he says. "If someone told me that's what I was going to be doing after graduating from WPI, I wouldn't have believed them."

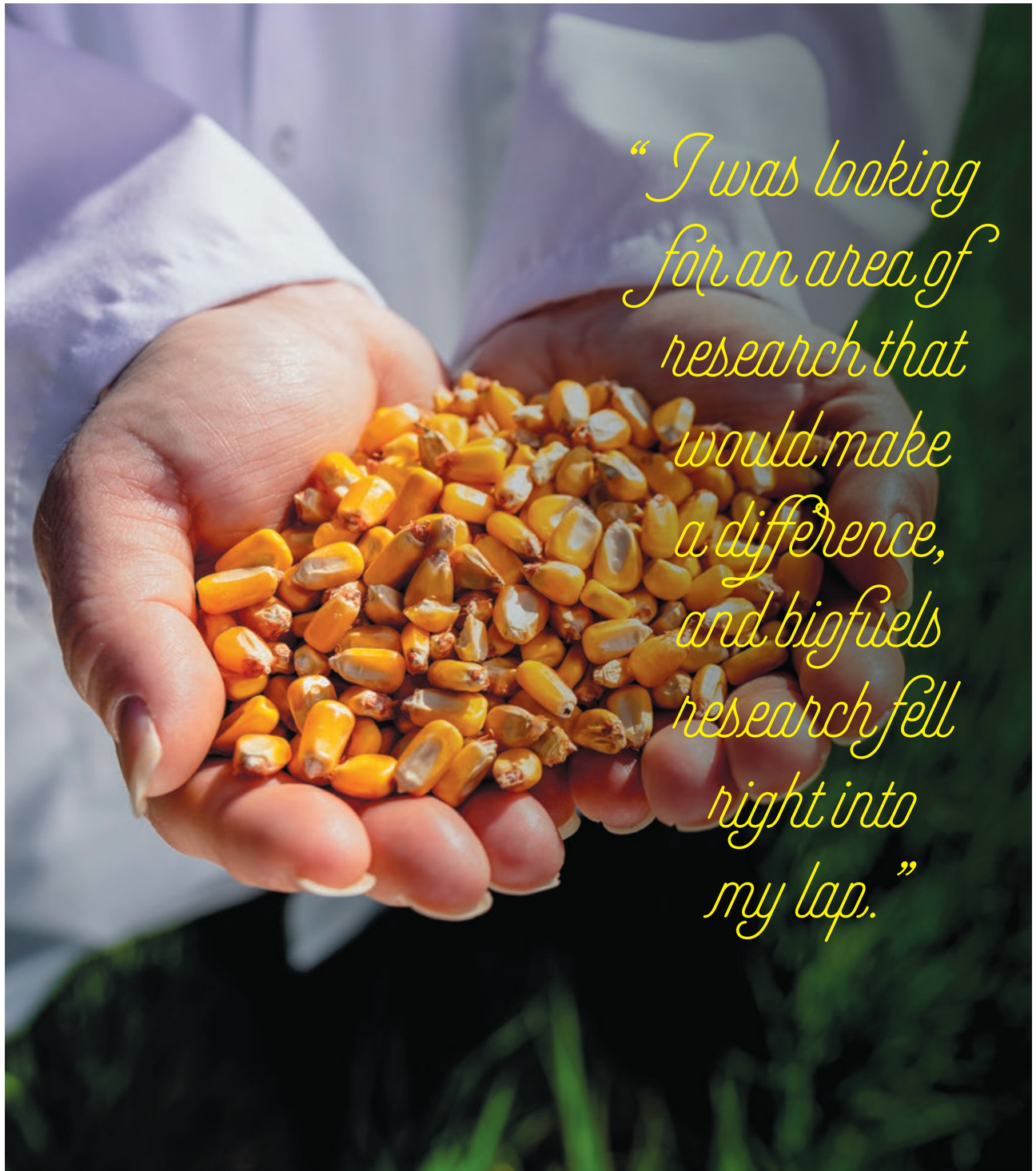
Managing the Strain

Jennifer Headman '01 uncovers the secret power of microbes, and how they just might save the world.

By Scott Whitney
Photography by Greg Latza

In the early months of the pandemic, millions of Americans found a welcome distraction in the wonderful world of yeast. If Instagram was to be believed, every kitchen across the country boasted a frothing sourdough starter just right for fresh bread and fluffy pancakes. We fed the starter meticulously; we shared tips and tricks over Zoom; we marveled at a world of microbiotics we had discovered. But for Jennifer Headman '01, it was just another day at the office.

For more than 20 years, she has researched groundbreaking applications for bacteria, yeasts, and enzymes, including environmental clean-up and the development of biofuels. Along the way, she has grown a reputation as a microbiologist with a message: Fermentation can produce far more than delicious baked goods—it might just save the world.



Something Rotten in Denmark

As a high school science student, Headman recalls her earliest introduction to fermentation as closer to alchemy than microbiology. Thanks to a food science class, she discovered what would become a lifelong fascination with the power of unicellular organisms. "I thought it was so cool that you could put one thing in a jar, add something else, and it would produce an entirely new product on its own," she says. "In particular, yeast's ability to grow anaerobically seemed really neat to me."

There was little doubt that Headman's profession would be in the sciences, but, like yeast itself, her academic focus on microbiology had a lag phase. It wasn't until arriving on the WPI campus as an undergraduate that she rekindled her fascination with all things microbial, which laid the groundwork for a career as a fermentation specialist. As part of her Major Qualifying Project (MQP), she researched the ability of bacteria to clean polluted soils.

"We found that certain bacteria could survive in the presence of really high levels of metal. In some cases, they could actually pull metals and other contaminants out of the environment," she explains. "These contaminated sites weren't barren wastelands; there were living things present in the soil that we could amplify to help clean things up." Through the course of that project, she discovered a field of research that would become foundational to all her future work: microbiology that made the world a better place.

Following her graduation from WPI, Headman began her PhD studies at the University of Wisconsin-Madison, and soon after headed to the Technical University of Denmark on a Fulbright scholarship, where she joined a Danish team of scientists focused on fermentation research. The team had access to large-scale bioreactors, allowing Headman to take engineered yeast strains from the bench to production. In retrospect, she credits her time in Denmark with introducing her to the niche field of fermentation microbiology. "Being in a community of people who thought constantly about fermentation—rates, yields, and how to optimize them—was an exciting experience for me," she recalls. "The new equipment I had access to was necessary to get into those conversations, but I was impacted more by the mindset of the people I was working with."

She later returned to the University of Wisconsin, where she researched the potential for microbial organisms to clean up explosives and ammunition depots. But sourcing raw materials in the wake of 9/11 proved prohibitive and she soon found herself looking for a new focus for her research. Her search led her to UW-Madison professor Thomas Jeffries—and the beginning of her life's work.

At the time, Jeffries was working with *Scheffersomyces (Pichia) stipitis* and *Spathaspora passalidarum*, specialized yeast strains found in the stomachs of beetles. With the help of these strains, wood-boring beetles are able to digest a diet rich in xylose, a sugar found in the otherwise inedible portions of grasses, corn, and other plants. He theorized that these yeasts could also be useful in extracting ethanol biofuel from portions of plants that would otherwise be considered waste. Headman threw herself headlong into this line of research, uncovering new ways to put yeasts and enzymes to work in making meaningful change. "I was looking for an area of research that would make a difference," she recalls, "and biofuels research fell right into my lap."

Every Part of the Buffalo

As gas prices soar, ethanol blends promise a low-cost, low-carbon alternative to traditional fuels. In the summer of 2022 alone, the Environmental Protection Agency authorized the continued sale of fuels with an E15 blend, representing 15 percent ethanol. But biofuels are not without controversy and many environmental activists argue that ethanol blends are not the panacea they are often purported to be. While corn ethanol may

boast a lower carbon output, the number of acres that require cultivating may offset the gain. Or so goes the counterargument.

Meanwhile, in the South Dakota headquarters of POET biofuels, Headman and a team of like-minded scientists are responding to those concerns in the best way they know how—in the lab. If they can find ways to boost yields and make the extraction process more efficient, they will continue to drive down ethanol's cost and carbon footprint. And what's the secret ingredient to unlock that goal? Here's a hint: your sourdough starter requires it.

"Every day, we're trying to find yeast and enzymes that improve our yields and make the whole process more economical," says Headman. "Ultimately, we want to ferment the same amount of corn, but get far more product out of it, whether that's corn oil, ethanol, or enhanced distiller grains that farmers use for feed." She explains that sugars like glucose and fructose have long been known as plant-based energy sources that can be converted to ethanol. However, the industry has made considerable headway in converting nontraditional sugars present in corn, including xylose and arabinose. For these sugars, identifying the right yeast or enzyme for the job involves testing countless strains and processes.

Steve Lewis, vice president of technology and innovation at POET, explains the full import of the work that Headman and the research team have undertaken. "When it comes to the efficiency of ethanol, we're really improving on an S-curve that we previously thought had plateaued," he explains. "For 30 years, we've focused on improving the manufacturing process once the corn gets to the plant—and we'll continue to do so. But now, we're also helping farmers lower the carbon intensity on the front end."

"Every day, we're trying to find yeast and enzymes that improve our yields and make the whole process more economical."

When it comes to yeast strains that can boost production, Lewis points to Headman's past research with biotechnologies as her secret weapon. "We're looking for needles in haystacks with these strains," he says. "Jen's been in the industry for a while, so she is helping us get to those needles faster and avoid the landmines she's seen before."

Both Headman and Lewis agree that traditional engineering can get the industry only so far in its search for maximum efficiency. "We have a better ability to improve with biology at this point, even beyond traditional engineering," says Lewis. "And much of that biotech work revolves around fermentation research, which is Jen's passion."

ETHANOL HAS THE POTENTIAL TO BE A LOWER-COST, LOWER-CARBON ALTERNATIVE TO TRADITIONAL FUELS. JENNIFER HEADMAN AND FELLOW SCIENTISTS ARE WORKING TO BOOST YIELDS AND MAKE THE PROCESS MORE EFFICIENT TO DRIVE DOWN ETHANOL'S COST AND CARBON FOOTPRINT.

As Headman and the POET team identify yeasts and enzymes capable of consuming elements of a corn plant (or other plants) that previously would have been considered waste—including the stalks, leaves, and husks—yields increase and the need to cultivate more acres will decrease. All of this spells greater efficiency and a lower carbon intensity. And for the long term, this innovation could become a key component in reducing dependency on non-renewable fuel sources. "Unlike fossil fuels, we have a nearly limitless source with bioethanol," says Headman. "Our work at POET is focused on getting as much from clean and renewable sources as possible. If we feel that a product or process is going to hurt the planet or a community, we're just not going to do it."

Headman cites her passion for renewable energy as the driving force behind her research. But her professional arc has revealed far more than just the next great yeast strain—it has also become a profound journey of self discovery.

Superpower and Kryptonite

As many scientists will tell you, it's not the microscopic organisms that pose the greatest challenge; it's often the multicellular organisms on two legs that give you fits. "Learning to communicate with different kinds of people, each with their own communication style, has always been a challenge for me," Headman admits. "I can be really direct, and I don't always consider that my coworkers may have feelings about the project they're working on. I've discovered that my brain works a bit differently from most.'"

As an undergraduate at WPI, Headman's direct communication style rarely posed a problem—in fact, it kept her in good company. "I met a lot of people there who communicated the way I do," she recalls. "And, in general, I learned to work with people from so many different backgrounds and skill sets. Knowing how to deal with various stakeholders, managing their respective needs and wants, that all came from WPI."

Once she entered the workforce, however, she encountered colleagues who found her "just-the-facts" approach challenging. Although she intended for her communication style to be efficient and in service to her coworkers, she was often misunderstood as not being a team player. "I reached a point where it seemed I couldn't do anything right, and it caused me to psychoanalyze every interaction I had," she recalls. "I would go into the lab on a weekend and some of my coworkers would think I was doing it just to show how much harder I was working. Meanwhile, I'm thinking, 'I did that so you didn't have to!'"

Headman then received a critical piece of the puzzle: at 38, she was diagnosed as being on the autism spectrum. Though the news was not surprising, it helped her understand that with a little bit of self awareness, she could leverage the gifts inherent to her condition. "I've come to see it as a strength. When we're working on a new project, I can quickly recall the specifics of a similar project I worked on eight years ago, which often points us in the right direction." Here, Headman pauses before adding, "Although, I've learned to first ask my coworkers, 'What do you think?'"

Lewis describes Headman's autism as both her "superpower and kryptonite." He notes that she often uses her razor-sharp memory and incisive analysis to steer the team away from pitfalls. "We're always trying to balance advocacy against inquiry," says Lewis. "While the advocacy side is saying, 'This direction seems exciting; let's keep going,' we need the inquiry side to ask, 'Where are the landmines in that approach?' That's Jen's strong suit."

According to Headman, her journey of self discovery has made her a more valuable team member. She describes her role at POET as that of a knowledgeable facilitator—who is also paid to kick the proverbial tires. "My job is to support my coworkers' enthusiasm around a new product, but also make sure that when we take it to scale, we don't discover something we could have tested back in the lab," she says. "We might be working with the best yeast strain we've ever seen, but if it fails 2 percent of the time in practice, the economics won't make it worth it. I need to see that coming and share it in a way that others can hear."

The Head and the Heart

Although her "brain works differently," to use Headman's words, it's her heart that's always had the final say. As a student at WPI, Headman knew she wanted to spend her career in service to others and to the planet, a litmus test she has never strayed from. "When I was considering career options, I ruled out any work that would hurt animals," she says. "And I was especially interested in work that would help the planet."

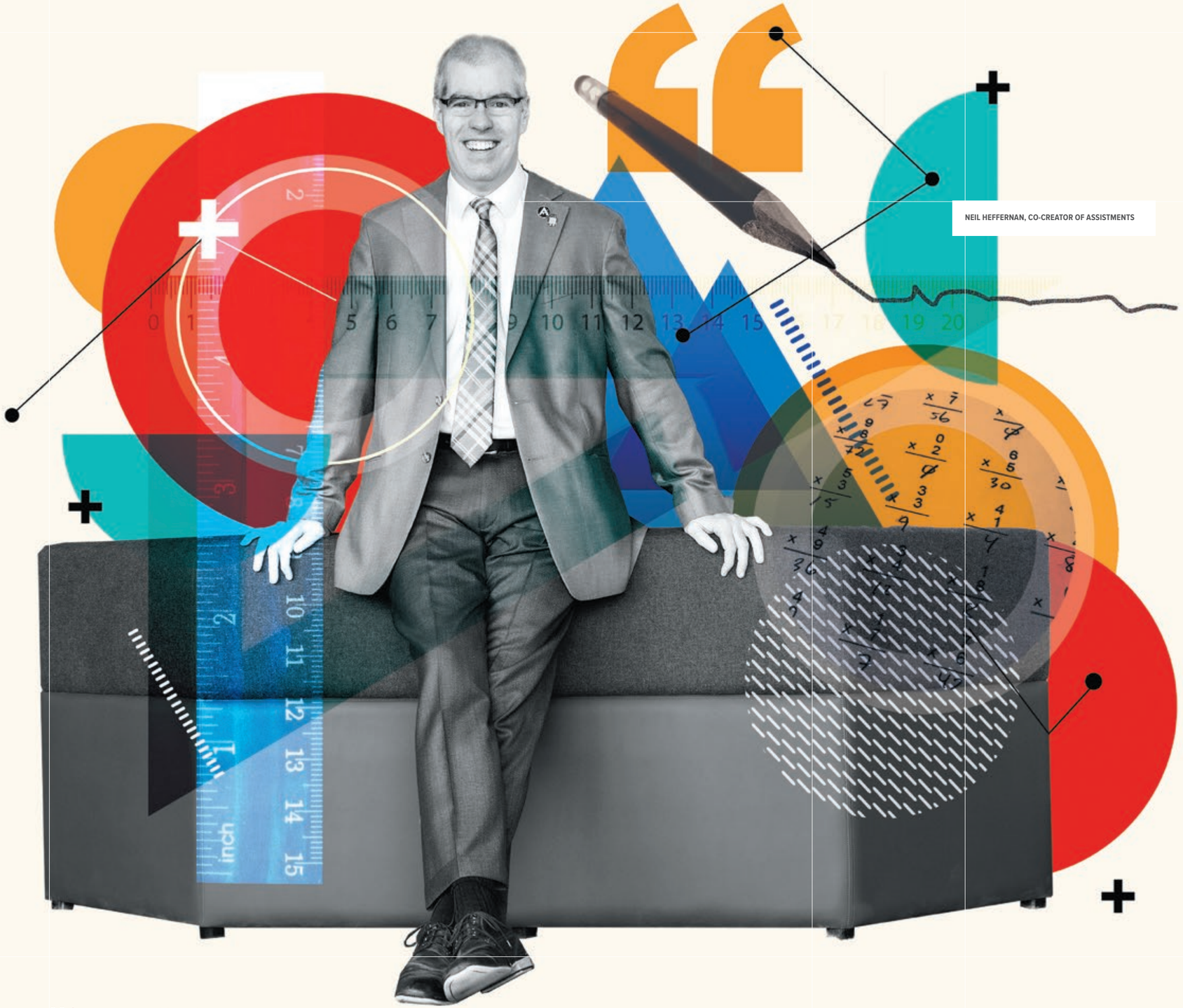
From her early research on pollutant-eating bacteria to her current work improving the efficiency of renewable energy sources, Headman's strong ethics have served as her guide. She cites her family as the source of her moral compass. Her grandfather, a second-career minister, gave up a comfortable job to return to seminary school and dedicate the rest of his life to helping others. "He was one of the most humble people I ever met," she recalls. "When I saw the good he did for others, it led me to want to be helpful in life."

During college, Headman's drive to make a difference was galvanized when she met a WPI alumnus named John Grossi '95. An active member of Alpha Phi Omega fraternity, Grossi pushed her to get involved in the organization's many community service initiatives, often driving her to and from events and refusing gas money.

"He would say to me, 'When you're in a position to give back in the future, give back.'" Just a few years after their meeting, Grossi received a diagnosis of colon cancer. Following his death, Headman took her friend's directive to heart. "It pushed me to make the most of the time we have and not put off doing for others," she says.

Following her graduation from WPI, Headman remained an active member of Alpha Phi Omega, starting a new chapter during her time at the University of Madison-Wisconsin. Today, she serves as regional chair for chapters in North and South Carolina. Throughout her time with the fraternity, she has worked in support of women's shelters, environmental clean-ups, and creating safe spaces for homeless mothers when other shelters are closed.

For Headman, her day job and volunteer work are two sides of the same moral coin. "Seeing the good my grandfather did, I wanted to be sure that I was always, always in service to others," she explains. This perspective didn't just include career decisions—it drove them. "I made a decision early on to search out companies that have a positive impact on people and the environment," she says, adding with a shrug, "I guess that's just how I was raised." In that spirit, she sidles up to the lab bench, ready to test a new yeast strain and honor those who have made her the scientist she is today.



> NEIL HEFFERNAN, CO-CREATOR OF ASSISTMENTS

ONLINE MATH HELP THAT WORKS

ASSISTments, a free educational platform developed by WPI researchers, uses immediate feedback to improve learning outcomes.

BY MIKE DORSEY
ILLUSTRATIONS BY ROSIE CLARKE

AT a kitchen table somewhere in America, a seventh grader is doing her math homework. She works through a set of problems on paper, one by one, entering the answers into a computer program that instantly tells her whether those answers are correct. When she gets a problem wrong, the computer may offer a hint, it may explain the math behind the problem, or it may walk her through the problem, step by step (a process called scaffolding).

The next morning, when she takes her seat in class, her teacher has already viewed a report that shows how she and her 22 classmates did on the previous night's work. Seeing that nearly everyone struggled with the same two problems, the teacher will take the time to discuss the underlying concepts of those problems before launching into a new lesson.

These scenarios may not seem revolutionary, but they represent a significant upgrade in the way middle-school math instruction has traditionally unfolded, with students completing homework largely unaware of whether their answers are right—or why they may be wrong—and teachers not fully tapped into what their charges have and have not mastered. The key difference for students and teachers is simple: feedback. When students get immediate feedback and help, they learn more. When teachers get feedback on the performance of the whole class, they can focus their efforts where it is most needed.

Providing immediate and constructive feedback is one of the guiding principles behind the learning platform that made those scenarios possible. Known as ASSISTments, it has been developed over the course of nearly two decades by a couple who first met when they were middle school teachers: Neil Heffernan, William Smith Dean's Professor of Computer Science and director of WPI's Learning Sciences and Technology program, and Cristina Heffernan, who directs the ASSISTments Foundation, a nonprofit formed in 2019 to scale up and expand the platform.

From an experimental web-based program rolled out in a small number of Central Massachusetts communities in the early 2000s, ASSISTments has grown into a robust educational and research platform that is made available at no cost to any teacher or school that wants to use it. So far, it has helped more than a million students around the country, earned top honors in a U.S. Department of Education online resource, served as a lifeline to teachers whose students have grappled with the challenges of remote learning during the COVID-19 pandemic, and won more than $67 million in funding from federal agencies and philanthropic organizations, more support than nearly any other research program at WPI.

FIRSTHAND CLASSROOM EXPERIENCE

Neil Heffernan's interest in making education work better began at an early age. As a high school student in Florida, he read books on education reform and browsed copies of *Phi Delta Kappan*, a journal on K-12 education. "That's what principals read," he says, "and I was geeking out on it in high school. I was clearly a weird outlier."

At Amherst College, where he majored in computer science and history, he organized 75 students and transported them to nearby Holyoke, Mass., to tutor elementary school students. At Amherst he also recruited students to Teach for America (TFA), which sends college graduates on two-year stints to teach in under-resourced schools. After signing up about five percent of his class, he also joined TFA and found himself teaching math in a predominantly Black section of Baltimore.

"I was totally convinced," he says, "that I wanted to be Jaime Escalante, the teacher portrayed in the movie *Stand and Deliver*—the guy who was personally responsible for one-quarter of all Mexican Americans who passed AP calculus. Turns out, I was no Jaime Escalante. My classroom management was really bad. I set a record for the most students sent to the principal's office."

The experience did prove to be the start of a career, just not the one he had envisioned. Recognizing the challenges teachers face as they seek to move an entire class of students along a learning path without leaving anyone behind, and drawing on his knowledge of artificial intelligence, Heffernan wondered if educational technology might offer a solution.

Then three things happened: He enrolled at Carnegie Mellon University to pursue a PhD under the mentorship of some of the leaders in the development of intelligent tutoring software; he met Cristina Lindquist, the future Cristina Heffernan, who was teaching middle school math after returning from the Peace Corps; and he was diagnosed with brain cancer.

For his dissertation, he built an algebra tutor, in part by recording Cristina as she conducted one-on-one tutoring sessions with students. "I just watched what she did," he says, "and made the computer do some of her 'moves.'" Heffernan released the program, called Ms. Lindquist, on the Web for free, and it quickly became the most widely used intelligent tutoring system then available.

> "FEEDBACK IS SO IMPORTANT TO CAUSE LEARNING. YOU DON'T LEARN FROM JUST DOING MORE PROBLEMS. OR, AT LEAST, THAT'S NOT THE MOST EFFECTIVE WAY. FOR ALL THE KIDS WHO DO THE PROBLEMS AND GET THEM ALL WRONG, THAT'S CLEARLY DETRIMENTAL."

Several years into his PhD program, he received his brain tumor diagnosis and was given no more than three years to live. Fortunately, he found a surgeon who could remove the tumor and Heffernan remains cancer free to this day.

The near-death experience made him rethink his priorities. He took a break from his PhD program and began teaching in Sudbury, Mass. To help his students prepare for the MCAS (Massachusetts Comprehensive Assessment System), the state's mastery test for public schools, he printed out sample problems for students to complete on paper. "The obvious thing," he told the *WPI Journal* in 2006, "was to put those problems in the computer and to give students immediate feedback when they got one wrong."

"Feedback is so important to cause learning," he says today. "You don't learn from just doing more problems. Or, at least, that's not the most effective way. For all the kids who do the problems and get them all wrong, that's clearly detrimental."

Infused with a new sense of purpose, he returned to finish his PhD and joined the faculty at WPI, where he pursued a better way for students to learn via technology. That was the beginning of ASSISTments.

A VIRTUOUS CYCLE

From the beginning, education and research have combined in a virtuous cycle that has kept the platform continually evolving. When students and teachers use ASSISTments, their experience becomes data that can be mined for clues to potential new features and approaches, as well as insights into education, itself—particularly online learning.

Data from ASSISTments has contributed to Heffernan's 28 peer-reviewed journal publications and his more than 225 conference and workshop papers, poster presentations, and book chapters, while providing research opportunities for about 50 graduate students and more than 200 undergraduates completing Interactive Qualifying Projects and Major Qualifying Projects. In addition, data sets from ASSISTments are made available to other researchers through E-TRIALS (Ed-Tech Research Infrastructure to Advance Learning Science), which Heffernan created. It has produced at least another 50 published studies.

"I'm proud of that," Heffernan says. "I've made WPI known as one of the homes of open science. And we recently received $2 million from the U.S. Department of Education (DOE) just to make our platform have better capabilities to do this type of research."

Heffernan and his team are also in the running for the $1 million Digital Learning Challenge hosted by the X-Prize Foundation. Sponsored by the DOE, the challenge seeks to "modernize, accelerate, and improve the ways in which we identify effective learning tools and processes that improve learning outcomes."

"They want to reward the organization that can best run experiments at scale," he says. "And it is probably true, if I may be so immodest, that no one comes close to what we are doing."

Of all the research conducted about ASSISTments, one study looms particularly large, for it sought to answer a question to which Heffernan had long been able to provide only an educated guess (along with ample anecdotal evidence): Does ASSISTments really improve student learning? Funded by a $3.5 million award from DOE's Institute of Education Sciences, SRI International ran an independent, objective study in Maine where every middle school student receives a laptop to use in class and to take home to do homework.

The study took 43 public schools, with 2,850 seventh graders, and paired them according to a variety of demographic factors. In half the schools, students did their homework in the traditional fashion. In the other half, they used ASSISTments and teachers received daily reports on their work. As reported in the journal *AERA Open*, when measured by scores on standardized testing, students who used ASSISTments realized a 75 percent improvement in learning over what would have been expected in a typical year. The effect was greatest for students in the bottom half of their classes; their learning improved 100 percent.

The study yielded significant benefits. For one, the DOE included the study in its What Works Clearinghouse, giving the highest possible rating: highest rating: "Meets WWC Standards Without Reservations." It noted that the study "provides the highest degree of confidence that the intervention caused the observed effect." For another, the Office of Science and Technology Policy asked Heffernan and the authors to present the study results at the White House.

The What Works listing opened new pathways to funding from the government and from public charities, including the Gates Foundation. For example, it helped gain the attention of the Schmidt Futures Foundation, started by Eric Schmidt, former CEO of Google, and his wife, Wendy. A $2 million grant from the foundation and other philanthropic support helped launched the ASSISTments Foundation and scale up the platform.

The DOE recognition also helped ASSISTments garner two $8 million awards from the DOE's Education Innovation and Research program. The first, awarded in 2019, is being used to expand ASSISTments to new users across the country, improve the user experience, and provide professional development for teachers. The second, awarded in 2021, will be used to make human tutors more efficient by providing a data dashboard with student performance data from ASSISTments use.

The DOE funds have also allowed the Heffernans to pursue a personally important goal: conducting research aimed at showing that ASSISTments helps close the achievement gap in math. While the SRI study in Maine showed that the greatest gains in learning were realized by lower performing students, there were not enough underrepresented students in the study population to test how their performance changed.

A similar study in North Carolina aimed at answering that question ended before it could be completed when school closures during the pandemic preempted a required post-test. Schools are currently being

"I WANT TO BUILD AN ECOSYSTEM WHERE TEACHERS ARE WRITING CONTENT BECAUSE THEY WANT TO HELP THEIR OWN KIDS."

recruited for a new nationwide study that may finally show what the Heffernans have long believed: when teachers use their daily ASSISTments reports to continually refine their teaching in response to what students are and are not learning, the whole class benefits. But students who most need a helping hand benefit the most.

A PANDEMIC LIFELINE

When the COVID-19 pandemic led schools across the country to shut their doors and switch to online learning, millions of teachers, students, and parents needed an immediate helping hand. Some sought help from Web-based educational programs; for many, that search led them to ASSISTments. In early 2020, the creation of new ASSISTments accounts rose from the typical rate of about 300 a month to 6,000 in March and 7,000 in April. By September, more than 25,000 new teachers in all 50 states, and across all grade levels, were using the platform.

In response, the ASSISTments team, which has grown to 17 full-time employees, revamped the ASSISTments website to make it easier for new teachers to dive in, expanded the help center with weekly webinars for new and experienced teachers, and added a new Teacher Corner to share best practices.

The rapid expansion of ASSISTments was aided by the fact that the team had already entered the content of the most commonly used free middle school math curriculums into the platform and integrated it with Google Classroom and Canvas, the two most widely used K-12 educational delivery systems.

"It is now so easy for someone to adopt ASSISTments," Heffernan says. "I'm a seventh-grade teacher and just taught module 5, and I ask, 'Can I assign module 6?' Here are the exact problems. Just hit the button to assign them."

In future work, Heffernan, using cutting-edge AI, psychology, education theory, and sheer determination, will continue to seek to make ASSISTments even easier to use, more effective, and smarter (although he says he steers clear of using the label "intelligent tutor," which some educators associate with overhyped and ineffective products). "I like to tell teachers I get grants to make slightly less-dumb educational software," he says.

Many of his current projects focus on crowdsourcing. Already, he is encouraging teachers to submit hints, explanations, scaffolding items, and best practices to benefit other teachers. "I want to build an ecosystem where teachers are writing content because they want to help their own kids," he says. "We can then test that content at scale and see what works."

As with Wikipedia and Stack Overflow, a resource for programmers, this altruistic output, through testing and iteration, will find its way out into the world to make a difference in the lives of students and teachers. "That's what it has always been all about for Cristina and me," Heffernan says. "Figuring out how to properly motivate children and cause better learning."

"We're all custodians of what's happening at the university today, and the university can't do those things without the support of the community and its alumni."

LARRY HERSHOFF,
SON OF LEN HERSHOFF '43

Len Hershoff '43 was a fierce supporter of WPI, having established a charitable gift annuity and a charitable remainder trust with the university. His son, Larry Hershoff, a member of the Alden Society since 2019, is now continuing his father's philanthropic legacy at WPI by establishing a charitable gift annuity and adding to the Len '43 and Mary Hershoff Endowed Scholarship Fund.

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ALUMNI NEWS

From the Desk of

PAULA M. DELANEY '75 PRESIDENT, WPI ALUMNI ASSOCIATION

Dear Alumni,

As our students get ready to return to campus, I find myself thinking back on the past year, my inaugural year as Alumni Association President. Although WPI joined the world in facing truly extraordinary challenges, I am glad to see the heart and soul of this great institute has not been diminished.

Whether on campus or virtually, our students held fast to the university's founding tenets of theory and practice. Facing unprecedented challenges, they persevered toward WPI's third tower: impact. Both locally and worldwide, WPI students have made a positive difference. Here's a small sampling: Justin Amevor '20, MS '22, who launched a food truck business to fight food insecurity in the Worcester community; Mia Buccowich '22, Brian Fay '22, and Andy Strauss '23, who developed a robotic hand prosthetic for a college student in Texas; and Raymond Magambo '21, who started a transportation ticketing company in his home country of Tanzania.

Our faculty followed suit as they continued to push the boundaries of science and research: Architectural Engineering Professor Nima Rahbar and Richard T. Whitcomb Professor of Chemistry and Biochemistry Suzanne Scarlata are developing self-healing concrete; Biology and Biotechnology Professor Pam Weathers is researching a medicinal herb to fight COVID-19; Robotics Engineering Professor Greg Fischer is working to develop machines that carefully guide the hands of surgeons; and Biomedical Engineering Assistant Professor Catherine Whittington is researching pancreatic cancer. They all stand as examples of the WPI community who are working to make the world a better, safer, more humane place—even in the most trying of times.

We alumni have played our collective role as well. Since last October's launch of *Beyond These Towers: The Campaign for WPI*, generous philanthropic donors have helped the university achieve more than $200 million in campaign commitments toward a $350 million philanthropic goal. Overall, we are more than 70 percent of the way toward the campaign's $500 million combined philanthropic and research goal.

LEARN HOW YOU CAN SUPPORT OUR GREAT ALMA MATER HERE: **WPI.EDU/+ALUMNI** AND **WPI.EDU/+GIVE**. TO FIND OUT MORE ABOUT *BEYOND THESE TOWERS: THE CAMPAIGN FOR WPI*, VISIT **WPI.EDU/+BEYOND**.

Celebrating WPI's Donors and Their Impact

More than 100 donors and key volunteers gathered at Unity Hall for a Celebration of Philanthropy on April 7. The group included alumni, trustees, parents, friends, faculty, and staff—those who had made leadership gifts to *Beyond These Towers: The Campaign for WPI* and those who have benefitted from the over $200 million generously contributed to the university thus far toward the $350 million philanthropic goal.

Providing guests with a close-up look at the stunning new building, the evening also featured 16 expo booths hosted by students, faculty, and administrators demonstrating the campaign's positive impact on student projects and faculty research that have the potential to change lives for the better. Guests also heard from President Laurie Leshin, WPI Trustee and National Campaign Chair George Oliver '82, PhD candidate Jack Grubbs '19, and Board Chair Jack Mollen.

"We have an incredible community of students, faculty, and alumni doing great things around the world," said Oliver, "and I couldn't be more excited about playing a part in advancing their efforts to make the world a better place." He and his wife, Karen (Zalewski) Oliver '82, are longtime WPI advocates who have generously supported *Beyond These Towers*.

A highlight of the evening was Mollen's announcement that the Board of Trustees approved the renaming of the Project Center building as the Laurie A. Leshin Global Project Center (see photo, page 10).

PHOTOS BY MELISSA ORTEN

Alumni Weekend is our favorite time of year, but Alumni Weekend 2022 was extra special. Our alumni family returned to our home on The Hill to revisit favorite campus spots, reunite with friends and classmates, and relive the traditions and memories that made our WPI experience special. It was a perfect time for reminiscing, exploring, and learning about new research on campus.

ALUMNI AWARDS

CONGRATULATIONS TO THE 2022 RECIPIENTS!

Recognized for their remarkable professional achievements and service to the university, these alumni bring pride to the entire WPI community. They were celebrated by their classmates, families, and friends during Alumni Weekend, May 19–22.

ROBERT H. GODDARD ALUMNI AWARD FOR OUTSTANDING PROFESSIONAL ACHIEVEMENT

KEN BALKUS '82 • NEAL CAPPELLINO '87 • PAUL GAYNOR '87 • ANTONY KOBLISH '87 RANDALL PARTRIDGE '72 • JONATHAN PERRY '87 • ROBERTA (NELSON) SHEA '77

ICHABOD WASHBURN YOUNG ALUMNI AWARD FOR PROFESSIONAL ACHIEVEMENT

JULIE (BLISS) MULLEN '12 • JODY (KENNISTON) STARUK '02

HERBERT F. TAYLOR ALUMNI AWARD FOR DISTINGUISHED SERVICE TO WPI

MIKE ABRAMS '77 • KAREN OLIVER '82

JOHN BOYNTON YOUNG ALUMNI AWARD FOR SERVICE TO WPI

KATHRYN (BYORKMAN) GAUTHIER '12 • DAN SULLIVAN '12

TURNING POINT

Patrick McAuley '12 Brings Plant-Based Hot Dogs to the Fenway Faithful

PHOTO BY DERRICK ZELLMANN

Baseball and hot dogs. They go together like the Green Monster and Pesky's Pole, Lansdowne Street and Yawkey Way, the seventh-inning stretch at Fenway Park and Neil Diamond's "Sweet Caroline." It may be a daunting task to improve on such a classic combination, but Patrick McAuley '12 has plans to do just that through PlantPub Fenway, the newest location of his popular vegan restaurant set to open in summer 2022.

After opening the first PlantPub location in Kendall Square in 2020 (which has since been visited by celebrities including Zendaya and Ben Stiller), McAuley and his team will be taking over the 8,000-square-foot location of the former Boston Beer Works directly across the street from Fenway Park. The new restaurant will offer everything from burgers and pizza to wings (the cauliflower wings are McAuley's favorite) and ice cream—and yes, even Fenway Franks—all made from plants.

"We'll have it all," McAuley says. "And it'll all be done in a way that's a little better for you and better for the world."

Opening a restaurant in arguably one of the most popular areas of the city is a result of years of work, connections, and even a few cold calls. But McAuley's initial interest in pursuing a plant-based lifestyle came—for lack of better terms—out of left field.

After graduating from WPI in 2012 with a degree in management engineering and a focus on mechanical engineering, the only concrete aspect of McAuley's plan was that he didn't have one.

"I can't say I really had a vision at all," he says with a laugh, adding that his love and passion at the time was football; he was a quarterback for the Engineers. "I figured I would end up in some area of engineering, but I didn't really have a plan much beyond 2012, to be honest. I just kind of stumbled into where I am now."

A plant-based lifestyle wasn't even on McAuley's radar during his college years. Instead, he focused on a more traditional high-protein diet that he followed until he was about 25. Then he began developing arthritis, which he initially chalked up to over a decade of playing contact sports. A fateful decision to switch out his breakfasts for green smoothies was the catalyst to where he is today.

"It led me down this path of experimentation, and I just eliminated foods from my diet that didn't make me feel as good as that smoothie did," he explains.

Six months later, that path of experimentation led to a full-fledged lifestyle change—McAuley started a podcast, wrote a book, and gave a TED Talk that's been viewed over a million times, all with a focus on the benefits of a plant-based diet.

After reaching out through cold calls and coffee meetups, McAuley partnered with entrepreneur and investor in plant-based foods Sebastiano Cossia Castiglioni and renowned chef Mary Dumont to use their shared love of plant-based foods to develop PlantPub.

"It's a fully mission-aligned team," McAuley says. "That makes the challenges a lot easier."

Speaking of challenges, let's get back to the whole "opening a plant-based restaurant right next to one of the most beloved ballparks in America" thing. The concept is exciting, for sure, but it also has the potential to be downright terrifying. Boston sports fans are known for their loyalty to both their favorite teams and the traditions surrounding them; how do you break through the "hot dogs and beer" mentality that tends to go hand-in-hand with baseball and other sports, so much so that it's just as big a pastime as the game itself?

McAuley sees it as an opportunity.

"We like to describe ourselves as a bridge," he says, adding that he and his team work hard to create food and an atmosphere rooted in approachability. "We know there's going to be an extra layer of scrutiny, but we're an approachable way for people to experiment a little bit, to show that you don't have to sacrifice any of the flavor or taste that you love."

While McAuley's path isn't typical of an engineer's, it is one where he followed his passion through firsthand learning, which is what WPI is all about.

"The best thing about WPI is that it teaches you practicality," he says. "You're solving problems, and what I've learned in business is that it's just constant problem solving. Most things you don't have answers to, but you need that engineering mindset to be able to reverse-engineer something, find a solution, and keep things moving."

When Stiller stopped by PlantPub back in April, it wasn't just a cool photo opportunity; it was also the chance for McAuley to meet an actor who starred in *The Secret Life of Walter Mitty*, a movie McAuley counts as one of his favorites because it "demonstrates the power of stepping out into the unknown and embracing the uncertainty of life."

If anyone knows anything about that, it's McAuley.

"Everything meaningful I've done in my life has been a result of me going into the unknown and hoping for the best," he says. "You always leave with something to learn, and everything I'm most proud of has been accomplished by going beyond what's comfortable and embracing that challenge."

—Allison Racicot

PHOTO BY DAVID P. STOEHR

Alexandra Sanz-Guerrero ’12, MS ’13, Solves Problems with Teamwork

Alexandra Sanz-Guerrero understands the importance of teamwork when confronted with problems. At the Naval Undersea Warfare Center (NUWC) in Newport, R.I., she’s the lead systems engineer on a team that designed an autonomous drone that can be launched and recovered from a submarine—a U.S. Navy weapons system with a mouthful of a name: the Large Displacement Unmanned Underwater Vehicle (LDUUV) Snakehead project.

“In order to achieve success, it takes a lot of collaboration between engineers and scientists across multiple government organizations and disciplines,” she says. “As a team lead, I need to understand all engineering disciplines to come up with solutions to various problems.”

Sanz-Guerrero credits WPI’s project-based learning with developing the team-building and critical-thinking skills she uses every day in her career. In particular, she says her Major Qualifying Project experience in China gave her an early appreciation of why other points of view are essential. She and another WPI student worked with two students at Shanghai Jiao Tong University to develop a strobe light for fire alarms at Tyco Electronics. They ended up recommending a change to increase the efficiency of the fire alarm bulb.

“Working with two students from another culture was enlightening and brought a new perspective on how to solve the problem,” she says. “Having diverse points of view was a clash in the beginning, but as we worked through the problem together and worked as a team, we were able to come up with an innovative and unexpected solution. To this day, I make sure I have others around me to help bounce ideas around until we come up with an effective solution together.”

Sanz-Guerrero was a member of the women’s swim team from her sophomore year until graduating with her master’s degree in the five-year BS/MS mechanical engineering program. The swim team served as her campus family, making the grueling hours of training bearable. She also has many fond memories of working on projects in the library.

“The library was a very collaborative space where I would work with my swim teammates or my roommates,” she says. “Most of the time we weren’t even in the same class, but we’d be working together, supporting one another, and helping each other out where we could. It made doing homework and projects much more enjoyable.”

She describes her current LDUUV Snakehead project as “a modular, reconfigurable, multi-mission vehicle deployed from a submarine.” The lithium-ion battery-powered Snakehead guides, controls, propels, and maneuvers the drone, which can be launched and recovered underwater.

Her successes at NUWC, as well as her work as a mentor to other women engineers, recently earned her the Career Communications Group *Women of Color* magazine STEM Outstanding Achievement Award as a Technology Rising Star. The award recognizes women who have demonstrated exceptional achievements in STEM in their workplace and in their communities.

“To me, it means my hard work and achievements have been recognized within my organization,” Sanz-Guerrero says of the award. “It makes me feel like my efforts are acknowledged and supported by my workplace. I also hope that it provides motivation to other women as they work through their careers.”

She says she’s proud that the award announcement noted her mentoring skills.

“I find that proper mentoring and training provides new hires with confidence in their product and strengthens their abilities. They’re able to take what they’ve been taught and utilize it much quicker than having to learn from scratch,” she says.

“I still have a long way to go in my career, and none of it has panned out as I expected; but I wouldn’t have done it any other way. What I do know is that I will continue to take leadership roles within NUWC and pass my knowledge and lessons learned to others to help enhance their careers.”

—Kristen O’Reilly

"I gained the very obvious benefits of a first-rate engineering education, which is a great foundation for many careers. My WPI experience showed me the importance of collaboration, communication skills, and the willingness to help others. I credit these skills and values learned at WPI with much of my career and personal success."

PHOTO BY EDIN CHAVEZ

ENABLING ACCESS TO A WPI EDUCATION FOR TODAY'S STUDENTS

With Endowed Scholarship, James Mayer '77 Honors His Mother and His Alma Mater

There are as many reasons for giving as there are people who give. **James Mayer** has two reasons for his recent gift to establish the Louise F. Mayer Endowed Scholarship, and they're both quite personal. The first is to honor his mother for being such a strong role model in his life; the second is to offer gratitude to his alma mater for setting him on the path to a long and rewarding career.

Mayer, the oldest of five siblings, understood from a young age how fervently his mother persevered in the face of adversity. She lived through the Great Depression, served as a nurse in World War II, and raised five children on her own; Louise F. Mayer is, by all accounts, an exceptional person. Faced with all the challenges a young, widowed mother of five might come up against, Louise ardently supported her children and strongly encouraged each of them to earn a college degree so they might enjoy enhanced opportunities in life. He says of his mother, "I didn't realize at the time how hard that must have been for her—probably because she never made it seem difficult."

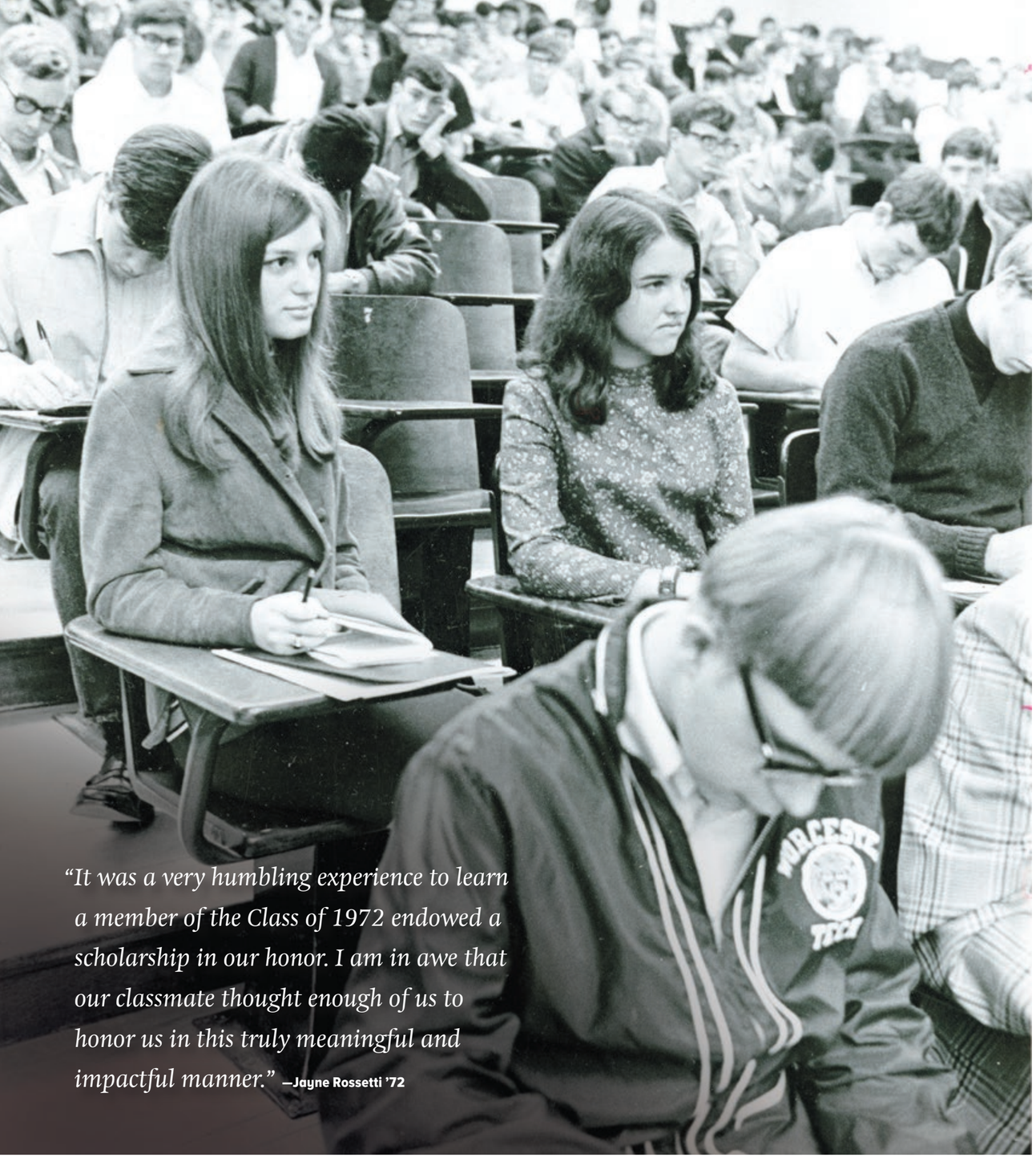
A Hopkinton, Mass., native with an interest in engineering, Mayer found WPI to be a natural choice. But his WPI journey took a rather circuitous route. "My first two years in the dorm and with Lambda Chi Alpha fraternity were fun. I made a lot of good friends but did not devote enough time to studies. I realized it was best to withdraw for a while." After four years working construction jobs in Boston, Mayer returned to WPI and earned his BS in civil engineering. Attributing a fair amount of his university success to faculty at WPI, Mayer says, "With the help of several great professors—including Carl Koontz, Frank DeFalco, and Robert D'Andrea—I had a very successful academic experience, and I am extremely grateful for their genuine interest in helping me."

Early in his career, Mayer started an environmental services and engineering company with four business partners. The company, which served the electric power industry in the Northeast, was sold to TRC Companies, Inc. in 2003. Mayer stayed on as president of the power sector, which is now made up of more than 3,000 people. He recently transitioned to executive vice president, leading the field services team and the development of new business practices.

"I gained the very obvious benefits of a first-rate engineering education, which is a great foundation for many careers. My WPI experience showed me the importance of collaboration, communication skills, and the willingness to help others," he says. "I credit these skills and values learned at WPI with much of my career and personal success. My career has been focused on building, leading, and developing engineering teams. I am a professional engineer, thanks to WPI, but I haven't done much engineering lately. I am lucky that WPI prepared me to do so much more."

The Louise F. Mayer Endowed Scholarship is specifically for students from single-parent households, with a preference for students from single-mother households. "I decided to give something back to WPI as a small token of my appreciation for the education I earned there, and it seemed like a nice gesture to my mother, who made it all possible for me," he says. "I hope this gift will enable others who may have circumstances like mine to benefit from some financial assistance to attend WPI. My hope is this scholarship in honor of my mother will make a real difference in the lives of its recipients."

—Sira Naras Frongillo



PIONEERING WOMEN IN STEM HONORED WITH AN ENDOWED SCHOLARSHIP

Lesley Small Zorabedian '72 and Jayne Rossetti '72 Endowed Scholarship

The legacy of WPI's first female students will live on in perpetuity through the newly established Lesley Small Zorabedian '72 and Jayne Rossetti '72 Endowed Scholarship. The financial need-based scholarship was funded by an anonymous member of the Class of 1972 to honor and celebrate the great accomplishments of Zorabedian and Rossetti.

According to the donor, "These two very smart and very accomplished women have earned and deserve respect, recognition, and admiration. Leslie and Jayne were true pioneers at WPI. Nothing was easy for them. Nothing was designed for them, not even the living conditions. Yet, they put on a brave face every day and accomplished something every day."

This year marks the 50th anniversary of the first woman undergraduate to earn a bachelor's degree from WPI. In 1968, the Board of Trustees voted to admit women undergraduates to the university, breaking WPI's century-old tradition of an all-male student body. Mathematics majors Zorabedian and Rossetti were the first women to enroll in the university in fall 1968. The following year, 24 women were admitted to the university.

Reflecting on her time at WPI, Zorabedian says, "I was happy to be able to enroll at one of the top engineering schools in the country. Many doors have been opened to me and many opportunities have been made available because of that degree. Even in my work at a law firm, I have drawn greatly on my WPI education."

Rossetti shares Zorabedian's sentiment. "WPI taught me how to think," she says. "I now approach problems with an open mind. I bring no preconceived thoughts into a problem. I have used this approach in all facets of my life."

Reflecting on those early years at WPI, she says, "Lesley and I were both naïve, small-town girls, each a class valedictorian. When I got to Worcester Tech, it felt as if I was infringing on 100 years of deep-seated male traditions. But I wasn't alone. Lesley and I were joined at the hip, taking the same classes, and eventually choosing the same major. It was a great relief when the women from the Class of 1973 arrived; not only did we then have dorm space, we were no longer the objects of curiosity."

It is the donor's hope that Zorabedian and Rossetti will serve as role models for WPI students. "They were always recognized; they must have felt they were constantly under the microscope," the donor says. "There must have been times when they really wished for some privacy. However, they figured out how to do things, and they persevered."

"It was a very a humbling experience to learn a member of the Class of 1972 endowed a scholarship in our honor," says Rossetti. "I am in awe that our classmate thought enough of us to honor us in this truly meaningful and impactful manner."

When asked about women in STEM at WPI, biomedical engineer Dana Maloy '22 says, "It feels especially rewarding to be a woman in STEM today. And as more and more women enter the STEM fields, we are changing the long-held status quo and giving voice to the world's many talented women engineers. It can be a challenge and feel daunting at times, but I know my peers and I will continue to work toward change and try to make a difference every day."

Contemplating the gravity of Zorabedian's and Rossetti's impact on women in STEM today, chemical engineering major Olivia Gedgaudas '22 offers a note of gratitude to WPI's first undergraduate women. "Thank you for your bravery and perseverance in paving a path for women in STEM. Because of you, WPI has made leaps and bounds toward gender equity with WPI's first woman president and its current student body [of which almost 40 percent are women]," she says. "We proudly stand on your shoulders."

—Sira Naras Frongillo

CLASSNOTES

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

DID YOU GET A PROMOTION? GET MARRIED? RECEIVE AN AWARD? EXPAND YOUR FAMILY? WRITE A BOOK? MEET A PERSONAL GOAL? CHAT WITH A FELLOW ALUM ABOUT THE GOOD OLD DAYS? WE WANT TO HEAR FROM YOU AND YOUR WPI CLASSMATES DO, TOO! TELL US YOUR LATEST NEWS AND IT MAY APPEAR IN CLASS NOTES—IT'S A GREAT WAY TO RECONNECT WITH YOUR FELLOW ALUMNI. ***CLASSNOTES@WPI.EDU.***

LESLEY SMALL ZORABEDIAN '72 , RIGHT, WITH PRESIDENT LAURIE LESHIN AT COMMENCEMENT.

1964

T. B. Puttaswamy resides in Greenville, S.C., with his wife, Shashi, and their daughter, Samantha. After retiring from ABB Global Engineering in the Netherlands, he has volunteered as an AARP Tax-Aide for over 10 years and serves on his subdivision's HOA Architectural Committee. He welcomes correspondence from WPI alums of '63, '64, and '65: *swamysha@yahoo.com*.

1967

Charlie Sisitsky was sworn in as mayor of Framingham on Jan. 1, 2022. He has 40 years of public administration leadership experience and an extensive record of public service. He served as an elected member of the town's Board of Selectmen from 1998 to 2018 where he served multiple terms as chairman and also led the Utility Abatement Committee, and the Traffic and Roadway Safety Committee. After Framingham became a city, Charlie was elected city councilor from District One, and served as chairman of the Planning & Zoning subcommittee of the city council.

1972

Lesley Small Zorabedian was honored with a Presidential Medal at the 2022 Commencement ceremony for her trailblazing efforts to help shape the university. She was one of the first women to be enrolled at WPI as an undergraduate in 1968 and became the first woman to receive an undergraduate degree from WPI.

1978

Mark Cioffi is the program analyst for the New Hampshire Prescription Drug Monitoring Program. He was reappointed to two of the governor's drug and alcohol prevention and treatment task forces (the Opioid Task Force and the Data and Evaluation Task Force). He says, "Everyone likely knows someone adversely affected. We have made progress decreasing the number of opioid prescriptions, their day's supply, and strength. However, we now see the statistics indicating increasing utilization of stimulants and amphetamines, especially in the 30–59 age group. This is a national trend that we will now focus on, without sacrificing gains made

against opioid abuse. As everyone knows, the COVID pandemic sent several projects into a holding pattern. We are back to moving forward."

Louis Collette is among the first Peace Corps volunteers to return to overseas service since the agency's unprecedented global evacuation in March 2020. "The Peace Corps is the best organization for foreign volunteer service. My brother was a Peace Corps volunteer. I am motivated to help," said Louis. He will serve as a health volunteer in Peru, working in cooperation with local community and partner organizations on sustainable development projects.

1979

Norman Guillemette writes, "I completed my seventh Boston Marathon with a time of 3:23:54—I placed 15th in my age group. My years running for WPI have inspired me to stay active in my sport. Coach Norcross was instrumental in my development as a runner."

1983

William "Bill" Fitzgerald was recently named chair of the WPI Board of Trustees. A trustee since 2013, Fitzgerald recently retired from GE Aviation, where he served as vice president and general manager of the Commercial Engines Operation. He was responsible for all commercial jet engine products and global support, including the GEnx product line, the fastest-selling jet engine in GE's history. In his most recent service on the WPI Board of Trustees, he chaired the Task Force on Diversity, Equity, and Inclusion, which focused on evaluating the Board's practices and purposes in recruiting and developing members who can authentically represent the current and future WPI community. Those efforts are informing the work of the Board's Nominations & Governance Committee, which he began chairing this year. Fitzgerald is also vice chair of the March of Dimes National Board of Trustees.

WILLIAM "BILL" FITZGERALD '83

Joel Kearns (MS '13, PhD '19) was promoted to deputy associate administrator for Exploration at NASA's Science Mission Directorate in Washington, D.C. He leads the Exploration Science Strategy and Integration Office and is manager of the Lunar Discovery and Exploration Program (LDEP). LDEP will send U. S. robotic landers and scientific instruments to the surface of the Moon every year starting in 2022, and provide scientific instruments for the Artemis Human Landing Missions starting in 2025.

1988

Jan Husby has been promoted to chief information officer of PRA Group. In this role he will drive information technology and business applications at a strategic level across PRA's global platform.

1990

Michael Fillion has been named chief operating officer at Conformis. He previously served as executive vice president, Global Operations at Tecomet.

PHOTO BY PETTY OFFICER 1ST CLASS AMANDA WYRICK, U.S. COAST GUARD

REAR ADM. JOHN MAUGER (MS FPE) '97

Jiong Ma (MS EE) has been appointed an independent board member of BusinessWire LinKinVax, a clinical-stage biotechnology company specializing in the treatment of infectious diseases and certain forms of cancer.

Joe Plante (MS BME) is now vice president and general manager of AMETEK's Instrumentation & Specialty Controls division. He previously served as division vice president and business unit manager for AMETEK Brookfield.

1993

Jim Gerren has been appointed Clark County (Nev.) building official and director of the Building Department. Having worked in the Building Department since 2004, he has served as assistant director since 2019. He is a licensed professional engineer in fire protection engineering in Nevada.

1997

Rear Adm. John Mauger (MS FPE) was named commander of the First Coast Guard District at a May 13 ceremony at Faneuil Hall in Boston.

2002

Derick Fors was featured in a *Worcester Telegram & Gazette* article that discussed his new business relationship with his former WPI golf coach, Tim Bishop. According to the article, Fors, a former member of the WPI golf team, is the general manager and director of golf at Northern Spy Golf Club in Townsend. He recently hired Bishop as head pro at this private club. Fors has worked at Northern Spy for a majority of his career and, according to Bishop, was known as an excellent golfer during his time at WPI.

2003

Maureen "Moe" Young was featured in a May 20 *Worcester Telegram & Gazette* article about her custom homemade "Moeshmallows." According to the story, she sells her hand-cut marshmallows at pop-up locations, as well as at local retail stores and the Worcester Public Market. She has created more than 40 flavors, including cotton candy, mocha chip, churros, strawberry champagne, watermelon, almond, and vanilla, as well as cocktail flavors like cosmo, margarita, hurricane, and mojito. Moe participated in EforAll Greater Worcester, a 12-week entrepreneurship training program, and won an award at the 2022 Winter Accelerator Final Presentation for her business pitch.

2017

NICHOLAS AND JULIA (SCOTT) LAROCHELLE WERE MARRIED IN MANCHESTER, N.H., ON FEB. 19, 2022.

SITTING FROM LEFT, ELIZABETH DESJARDINS '17, NICOLE QUINTAL '17, ANNA VALDEZ '17, KIMBERLY LAMSAL '17; STANDING FRONT ROW, FROM LEFT: SHAUNA GOULET, CARA BOVE '17, DREW DERUBEIS '17, JESSIE CIULLA '16, ANTHONY CAMPAGNA '17, MEGAN ERRICHETTI '18, CAROLINE CLARK '17, NICHOLAS LAROCHELLE, JULIA (SCOTT) LAROCHELLE '17, ANDREW SANTOS '17, YASUHA SANTOS, RUPAK LAMSAL '17, KYLER LAMSAL, JAYNE SCOTT '78; STANDING BACK ROW, FROM LEFT: NICK HASSAN '16, CHRIS BOVE '17, MICHAEL PAQUETTE '18, JESSICA WEY '18, MIKE CLARK '17, DAVID LAPLANTE '17, BETH MILOSCIA '15, DAVID SCOTT '15, KENNETH SCOTT JR. '76.

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2005

Edwin Rule (MS, MTI) has been appointed vice president, regulatory, quality, and compliance, of Bluejay Diagnostics in Acton, Mass.

2007

On Feb. 15, **Vanessa Castro** welcomed her daughter, Apollonia Mae Rybka, Class of 2044.

James Phelan was named to the 2022 Minuteman Hall of Fame, which honors alumni and former teachers, staff, or coaches who have gone above and beyond to exemplify the spirit of Minuteman High School in Lexington, Mass. James, who was named a Distinguished Alumnus, is the vice president of finance and operations at Verdox, a company that develops technology to reduce carbon emissions. He is an attorney and professional engineer with experience in finance, law, and engineering at start-up corporations.

2008

Christopher Roy (MS), general manager of Shrewsbury Electric & Cable Operations (SELCO), was named to the 2022 Power 50 list in *Worcester Business Journal*. According to the story, "Roy is creating symmetrical broadband speeds at the gigabit level or higher, which will be key in attracting new businesses, particularly tech companies, relying on the highest level of internet connectivity."

2012

Julie Bliss Mullen is the co-founder of Aclarity, a company that commercializes novel electrochemical water treatment systems for the complete, on-site destruction of contaminants like PFAS in wastewater. Aclarity has been nominated for Imagine H2O's Urban Water Challenge Audience Choice Award. Other WPI alumni in the business include **José Alvarez '15** and **Elisabeth Christ '21**.

2014

Hunter Putske and **Maria Grandoni '15** were married on March 19, 2022, in Madison, Wisc.

Qingyun Zhu (MS, PhD) received the Outstanding Faculty Award at the University of Alabama in Huntsville.

2021

Jenna Hirshfeld is an associate project manager in the Falmouth, Mass., office of RLC Engineering Project Management Organization.

Allison Silvia has accepted a software engineer position with Google in Cambridge, Mass.

2022

Tony Eid accepted a position with GE Aviation as a member of its Operations Management Leadership Program (OMLP). Over the next two years, he will take over three different roles in this full-time position.

Dean O'Donnell '86, the Heart of IMGD

The WPI community noted with profound sorrow and a great sense of loss the passing of Professor Dean O'Donnell, full teaching professor of IMGD, who died March 7, 2022. He graduated from WPI with a BS in Physics in 1986 before earning his MFA from Brandeis University in 1990 and returning to WPI as a professor in 1993. In 2004, he was a founding faculty member of IMGD.

Dean wrote numerous short plays, including "Legwork," which has been staged in various venues, from Yale University to the Viaduct Theatre in London, and in 2002 was converted into an independent film by Javier Reyna. When he returned to WPI in 1993 as a professor in the drama/theater program, he continued to play a leadership role in the larger Boston theater community. In 1998, Dean partnered with director Marc Smith to produce an augmented reality-enhanced rendition of "The Story of Dr. Faust" for the Foothills Theatre.

His broad thinking about storytelling took Dean into writing for games, working for such companies as Epic Games, Activision, and Iron Lore Entertainment. In fact, the giant statue of a minotaur that now stands in WPI's Gordon Library was from Dean's time at Iron Lore.

Dean was pivotal to the culture of IMGD, both in never forgetting the fun and possibilities of the medium but also in the professional outreach and mentorship he provided. He drew from theater pedagogy to introduce master classes to bring game professionals to WPI for intensive courses. He worked with students to design and implement our PAX East booth to highlight student work at a major industry event. For students wanting to work with industry partners, he negotiated MQP sponsorships with such giants as Disney and TenCent. During Showfest—an end-of-year event that Dean created for students to come together, eat barbeque, and play each other's games—he set up an interview couch, invited outside game developers and designers, and gave the students opportunities to be professionally interviewed about their newly created and released media, all streamed on Twitch. In 2018, Dean started the IMGD annual escape room.

He loved his wife, dog, and all things Disney and *Star Wars*. He found joy from being with friends, playing games, and telling jokes. He was the heart of WPI's IMGD program since its inception.

John Bjork '44 ME, MS, LAMBDA CHI ALPHA, Shrewsbury, Mass.
Robert Farwell '46 ME, ALPHA TAU OMEGA, Hudson, Ohio
Malcolm White '46 CHE, MS, PHI SIGMA KAPPA, Ashford, Conn.
Eric Peterson '51 ME, ALPHA TAU OMEGA, Mansfield, Ohio
David Hallock '53 EE, MS, Cedar Rapids, Iowa
Ian Davidson '53 ME, SIGMA ALPHA EPSILON, Rock Hill, S.C.
Gene Kucinkas '53 ME, SIGMA PHI EPSILON, South Portland, Maine
Herbert Peterson '53 EE, SIGMA PHI EPSILON, Worcester, Mass.
Paul Brown '55 CE, PHI SIGMA KAPPA, Westborough, Mass.
Richard Ferguson '57 EE, MS, PHI SIGMA KAPPA, Cincinnati, Ohio
Robert Galligan '57 CE, PHI KAPPA THETA, Lake Shore, Minn.
Larry Dworkin '58 EE, ALPHA EPSILON PI, Holmdel, N.J.
Norman Stotz '58 ME, ALPHA TAU OMEGA, Sterling, Mass.
John Gale '59 ME, SIGMA PHI EPSILON, Yarmouth Port, Mass.
Stuart Macomber '60 ME, ALPHA TAU OMEGA, Newton Center, Mass.
Kenneth Wheeler '60, MS NS, Shirley, Mass.
John Kappel '61 ME, Ama, La.
Kenneth Engvall '61 CE, SIGMA PHI EPSILON, Worcester, Mass.
William Holmes '61 SIM, PHI GAMMA DELTA, South Dennis, Mass.
Richard Hosmer '61 CE, Melrose, N.Y.
Thomas Quinn '62 CE, TAU KAPPA EPSILON, Schenectady, N.Y.
Rajnikant Dave '63 MS, CE, Martinez, Ga.
Carl Freeman '63 EE, PHI KAPPA THETA, Hampden, Maine
David Nordin '63 ME, TAU KAPPA EPSILON, Shelton, Conn.
John Lewis '65 CHE, THETA CHI, Rose Valley, Penn.
Rein Olvet '66 MG, PHI SIGMA KAPPA, Middle Village, N.Y.
Charles Jaworski '66 MS, NS, Rumford, R.I.
Anthony Sacovitch '66 ME, Worcester, Mass.
Athanasios Kanatsoulis '67 EE, SIGMA ALPHA EPSILON, Athens, Greece
William Clark '69 MSPH, PhD PH, Pittsford, N.Y.
Bruce Tuttle '69 ME, ALPHA CHI RHO, Flint, Mich.
Lawrence B. Cohen '70 CE, Boxborough, Mass.
Francis Gardner '70 ME, McKees Rocks, Penn.
James Hannoosh '70 ME, PHI KAPPA THETA, West Barnstable, Mass.
James Schwing '70 MA, Ellensburg, Wash.
David Asquith '71, SIGMA PI, West Melbourne, Fla.
John McGinnis '72 SIM, Dennis, Mass.
Daniel Robbins '73 CE, Belgrade Lakes, Maine
Daniel Palmer '74 ME, Kansas City, Mo.
Paula Stoll '78 CHE, MS, Hubbardston, Mass.
Andrew Tabak '78 ME, Weston, Mass.
Gary Krumpholz '78 EE, PhD EEW, Bedford, N.H.
Douglas Thompson '78 EE, Whitinsville, Mass.
Thomas Hatfield '81 SIM, Hilton Head Island, S.C.
Barbara McQuaid '81 MS, NS, Ware, Mass.
David Soderberg '81 SIM, Duxbury, Mass.
Douglas Fraher '83 LS, Waldoboro, Maine
Steven Davi '85 CS, Schenectady, N.Y.
Dean O'Donnell '86 PH, Easton, Penn.
Sheila Gough '92 SIM, Woodstock, Conn.
Thaddeus Tarasiak '92 SIM, Worcester, Mass.
Steven Dulin '93 ME, Shrewsbury, Mass.
Brett Hayward '95 BBT, Northport, Maine
Andrew Gagnon '06 BBT, PHI SIGMA KAPPA, Salt Lake City, Utah
Kevin Munn '07 ME, Wynantskill, N.Y.

The WPI community also notes the passing of these friends of the university: **Margaret Kranich, Bruce McQuarrie,** and **Richard O'Connor**.

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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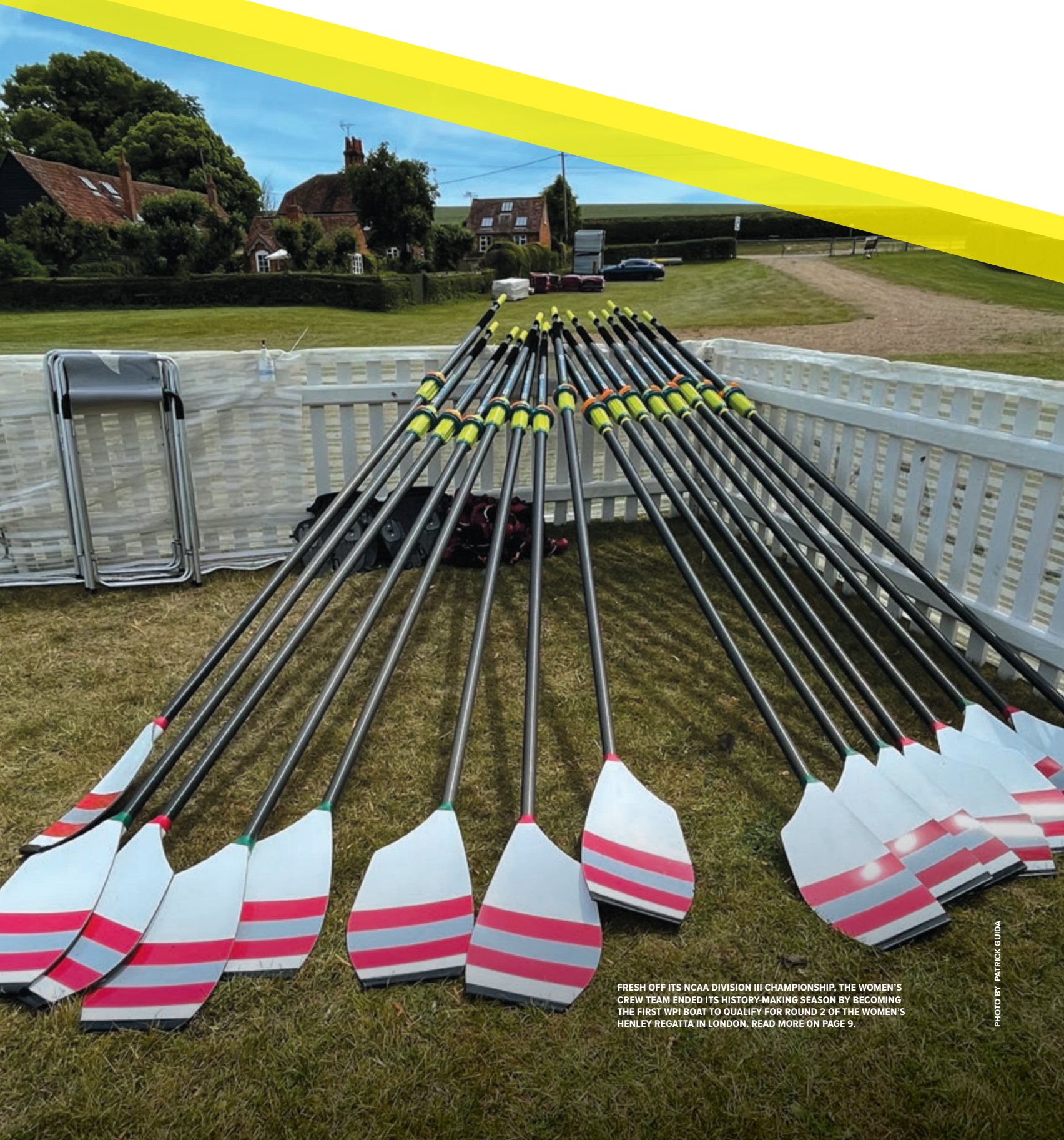

FRESH OFF ITS NCAA DIVISION III CHAMPIONSHIP, THE WOMEN'S CREW TEAM ENDED ITS HISTORY-MAKING SEASON BY BECOMING THE FIRST WPI BOAT TO QUALIFY FOR ROUND 2 OF THE WOMEN'S HENLEY REGATTA IN LONDON. READ MORE ON PAGE 9.

PHOTO BY PATRICK GUIDA