

SPEAKING
Green

CHRISTOPHER JAMES '78
HELPING POLICYMAKERS FIND
CLEAN AND EFFICIENT WAYS TO
POWER THE WORLD



FEATURES

20

IJEOMA EZEONYEBUCHI '14

Seamless Application:
Supporting NPR's mobile platform

BY AMY CRAWFORD | PHOTOGRAPHY MATT FURMAN

24

CHRISTOPHER JAMES '78

Speaking Green:
Helping policymakers find clean
and efficient ways to power the world

BY JOAN KILLOUGH-MILLER | PHOTOGRAPHY MATT FURMAN

30

DENICE O'CONNELL '98

Working with an Animal Instinct

BY SCOTT WHITNEY | PHOTOGRAPHY KATHLEEN DOOHER

36

MARCO KALTOFEN '09 (MS ENV), '15 (PHD CE)

Nuclear sleuth generates exotic data
from mundane objects

BY JOHN MARTIN | PHOTOGRAPHY MATT FURMAN

winter 2019

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02

LETTERS TO THE EDITOR

This page doesn't exist unless you take a moment to write an email to wpijournal@wpi.edu. We want to hear what you think about our recent issues.

03

A CONVERSATION WITH THE PRESIDENT

President Laurie Leshin talks with Mark Macaulay '89, '94 MS, the new president of WPI's Alumni Association.

05

INSIDER

Joshua Driscoll '20 conveys a love of the outdoors to his biology/biotechnology major

07

GLOBAL IMPACT

Exploring shared goals at the Morocco Project Center

08

WT

The latest in university news, research, and commendations

14

FACULTY SNAPSHOT

Destin Heilman, Associate Teaching Professor, Chemistry and Biochemistry; Director, UMass Medical School Project Center

40

TURNING POINT

Barry Siff '76 brings an entrepreneurial spirit to his athletic endeavors.

44

HALL OF LUMINARIES

The 2019 inductees to this illustrious honorary roll call

46

DONOR IMPACT

Helping to bring a new, technologically advanced building to fruition

48

WPI LEGACY

James Petropulos '83 and his daughter, Olivia '22, form a new legacy

52

CLASS NOTES

Whether you took a simple hike, purchased a mountain, or innovated a new rock climbing robot, we want to .share the news. Send a note (and a photo) to classnotes@wpi.edu.

60

COMPLETED CAREERS

In memory of alumni, faculty, and other members of the WPI community

LETTERS

TO THE EDITOR

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 Letters that mock or insult will not be published.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

Climate Design

Some of the articles on climate change in the Fall 2019 *WPI Journal* [Five Voices of Climate Change] were misleading at best, and alarming at worst, by stoking hatred. The root cause of global warming is not just “driven by greenhouse gases released by fossil fuel combustion,” and we should not respond “with anger ... as loudly as possible” calling global warming a “crime of environmental ruin.” On the same hand, I commend the articles focused on building for climate *resiliency* and combined with *adaptability* are the real point.

Fluctuations in global temperatures have multiple causes, including plate tectonics, boreal summer insolation, and global CO₂ concentrations. But the primary cause is orbital forcing—fluctuations in the orbit of the earth around the sun and rotations of the earth's axis and its polar tilt.

WPI would do science a great service by considering global warming from multiple

perspectives. The knowledge gained from scientific explorations of arctic ice and ocean sediments coincides with geophysical and atmospheric research and powerful computational modeling. One informs the other, and we are beginning to learn the multiple factors that drive global cooling—and warming—and what we can expect in the next glacial cycle.

Glacial periods in the last one million years took 80,000 years to build and only 4,000 years to melt, with atmospheric CO₂ levels around 290–300 ppm. During 20,000-year interglacial periods, ocean levels rose 50 to nearly 200 feet higher than they are today. Tipping points occurred quickly.

Present day CO₂ levels may have postponed the next ice age by 50,000 years (Ganopolski, 2016). In the near term, if CO₂ peaks near 900 ppm, ocean levels could rise 75 feet and global temperatures rise another 11 degrees F (Winkelmann, 2015).

But if we stop emitting CO₂, civilization will see another ice age with crop failures, hunger, extreme sub-zero temperatures, and glaciation costing billions of lives—a far greater risk. Long-term Anthropogenic CO₂ emissions could postpone the next glacial cycle by as much as 500,000 years (Archer, 2005).

By seeking to control the levels of atmospheric and oceanic CO₂, which I refer to as “climatedesign,” humanity may balance the rise of ocean levels while preventing the next deadly period of glaciation.

WPI should explore the multiple causes and risks that these important natural and anthropomorphic cycles represent to help determine the best pathways forward, and to design our climate to sustain human civilization through the next epoch in Earth's history.

John A. Mathews, P.E., Class of 1974

ON THE COVER

According to Christopher James, forests are our atmospheric lungs—spaces that inspire contemplative thought. “This old growth forest in Tacoma has allowed me many a time to solve problems and improve my creativity,” he says, “simply by being able to walk or bicycle through this beautiful area.”

EDITOR'S NOTE: We are defying the seasons yet again with a photo of Chris James at Point Defiance Park in Tacoma, Wash. Just because our offices back in Worcester may be immobilized by snow right now doesn't mean we can't celebrate our alumni around the world in more hospitable climes. This issue took us to some stunning places to meet more than a few impressive alums, and we're proud to share their work—and the work of our WPI community—through these pages.

ON LOCATION AT THE ARIZONA STATE UNIVERSITY POOL, EDITOR DOREEN MANNING SUGGESTS HOW TURNING POINT'S BARRY SIFF SHOULD STAND (HE PULLED OFF THE CONFIDENT LOOK MUCH BETTER—SEE PAGE 40).



PHOTO: MATT FURMAN

PHOTO MATTHEW BURGOS



President Laurie Leshin talks with Mark Macaulay '89, '94 MS, the new president of WPI's Alumni Association

LL Mark, it's great to be with you. Congratulations on becoming president of the Alumni Association—we're thrilled to have you. We're sitting here in the brand new Alumni Center at Higgins House—in the Alumni Lounge. Tell us a little bit about the opportunity for alumni to come and use this facility.

MM The beautiful part of it was the fact that Mike Abrams had done a little bit of traveling around the U.S., and found that a lot of other campuses had an alumni center, and he said, "You know what? I come from Houston, and love spending time here at WPI. It'd be great to have a place that the alumni can call home." So he was the one who endorsed it through the Alumni Association and WPI, and it's now a great spot that we can call home.

LL Mike and his wife, Nancy, were so generous in supporting the creation of the Alumni Center at Higgins House. We welcome all alumni to come here and utilize this space. It's really for them. Tell me a little bit about what you're looking forward to working on in the coming year.

MM We're looking into a way to dovetail with WPI what they're planning on doing for their next five year plan. We just started with a strategy session to find out exactly how we want to move forward. One of the major initiatives is TechConnect, where the Alumni Association can help alumni be better connected with WPI.

LL I think participation of our alumni in the life of the campus is so critical and TechConnect is one of the great opportunities for alumni.

You don't have to be here in Worcester or even in Massachusetts to use TechConnect to engage with us, to help our students, and to continue to advance WPI. So that's a great example.

MM And with the new Abrams Library in Higgins House, we now have the ability to have remote Alumni Association board members join the meetings through its teleconferencing capabilities.

LL Right. Most people think about Higgins House as being a little bit old school, but now we've got some high tech here, and it can be used for Alumni Association events, but also alumni gatherings that can become much more virtual. We can conference people in from all over the world, really. So we're going to be focused a lot on participation of our alumni as we move forward together as an institution. That's great. Tell me, what do you love about WPI?

MM I love it and I think a lot of graduates of WPI love it for the fact that it usually fits them, and I knew as I was coming out of high school that I was very good in math and science. I really didn't know what engineering was, but I knew at WPI the foundation of engineering was being good in math and science. So that's what brought me here. I found it also to be a fit in the fact that I was very active in sports—where I found my home in hockey and rugby—but I also joined a fraternity. And I'll say as an alumnus, our fraternity's motto was "friendship, the sweetest influence." I still have friends throughout all the groups that I was involved with at WPI. So it was a perfect fit for me.

LL We know that's true. So many of our students get a great education that results in a great work life, a great job, but also the connections they make across the various organizations on campus really serve them for life. And the Alumni Association is such a critical part of making sure that we stay connected to our whole alumni community. Thank you for that service and for taking that on. And thank you for being with us today.

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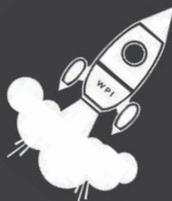
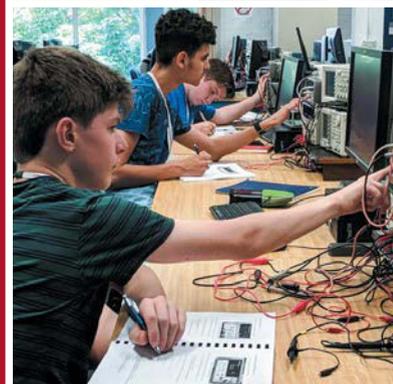


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The options don't stop there—our programs for students in grades 4-12 offer everything needed for a fun, STEM-filled summer.

BIOLOGY AND BIOTECHNOLOGY MAJOR JOSHUA DRISCOLL '20 says his love of the outdoors led to an early interest in the environment.

“You could frequently find me outdoors hiking, biking, paddling, you name it,” he says. His passion led to an interest in ecosystems, and how organisms play a part to keep environmental communities—including human—functioning. As his awareness intensified, he says he grew concerned about environmental crises that threatened to put all ecosystems at risk.

“When I searched for colleges,” he recalls, “WPI stood out to me with its focus on project work that would allow me to get directly involved in fixing these issues. Although I was not sure exactly how, I trusted I would be able to find this path at WPI.”

That spark ignited during his first year, when he volunteered with Marja Bakermans’ conservation field projects. She in turn introduced Driscoll to Andrew Vitz, her colleague at MassWildlife, who then invited him to volunteer on some of Vitz’s own projects.

“My first summer of field work was amazing, and I was able to work on a number of projects, including a migration tracking project on the Eastern Whip-poor-will, songbird banding in early successional forest, and grassland surveys for the Eastern Meadowlark,” he explains.

His sophomore year was supported through an internship at MassWildlife with Vitz, continuing his project work, as well as adding experiences in bog turtle tracking and water bird surveys on the harbor islands of eastern Massachusetts. Last summer Driscoll returned for his third season of field work, receiving support from the Explorers Club, as well as The Garden Club of America in partnership with Cornell University, to continue his whip-poor-will research.

In addition to his exciting fieldwork in the states, from March to May 2019 Driscoll completed his IQP with the Port Phillip EcoCentre in Melbourne, Australia. He shares that “through this experience, I was able to see the vast number of volunteer and private sector groups that were involved in this field, and I gained a new appreciation for the multi-faceted approach that is necessary for conservation and land management.”

Upon his return, he sought to increase and broaden his experience by taking part in a research lab with Professor Lauren Matthews on the behavior of crayfish under the threat of predation, and wrote his Inquiry Seminar paper on the history of environmentalism in Worcester. In addition, his MQP will compare land types on the breeding and non-breeding grounds of the eastern whip-poor-will using data obtained from the ongoing migration tracking project.

Driscoll is also a member of the Varsity Swim Team. “Swimming is something I’ve been doing since I was in grade school,” he says. Part of this year’s leadership team, he readily admits that being involved with the team hasn’t distracted from his studies, but rather has made him a more complete student. “Having practices helps me stick to a more rigid schedule, which allows me to complete all my work in a timely manner. Also, the swim team has become my family on campus and without their support I would not have had the same amount of success.”

Grateful for the research opportunities granted him so early in his college career, Driscoll devotes any free time he might squeeze in to supporting other WPI students along their journey. “I serve as a biology ambassador,” he says, “student tour guide, a member on the Arts & Sciences Student Advisory Council, and a mentor for a student involved in the Green Energy REU at WPI.”

After graduation, he plans to continue his work supporting the study the ecosystems of the world, “in the hopes,” he says, “that understanding these interactions will allow the human race to alleviate the current climate crisis.”



INSIDER

HONORABLE MENTIONS

Crimson Key Tour Guide • Peer Learning Assistant • Biology Department Ambassador • David LaPré Research Fellowship • The Garden Club of America’s Francis M. Peacock Scholarship for Native Bird Habitat • Dean’s List • Swim Team’s Hardest Worker Award



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ILANA ZELDIN '20 was looking to shake things up when she applied to the Morocco Project Center for her IQP last year. The daughter of Russian Jewish immigrants grew up in a wealthy suburb of Boston and was curious about life in an Arab Muslim country.

"I'd never experienced an Arabic culture and thought it would be a good opportunity to step outside my comfort zone," says Zeldin, a management information systems major.

She found the differences between Morocco and her home striking, but it was the similarities that made the deepest impression. Among these was the Friday evening tradition of gathering with family. Zeldin's family welcomes Shabbat, the Jewish sabbath, by dining together at week's end. In Morocco, families come together on Friday nights to share a meal of couscous.

"There was a cultural similarity that I didn't even know existed," she says. "It taught me that you should never be afraid to make connections with people who are different from you. Ever since then, I'm less afraid to try something new. It really changed my perspective on things."

Zeldin's experience is typical of IQP students in Morocco, says project center co-director Tahar El-Korchi. WPI established the project center in the city of Ifrane nearly two decades ago and moved to its current location in the capital city of Rabat in 2015.

"The students are working on a project that is challenging to start with—add to that the language is different, the culture is different, the food is different," El-Korchi says. "What they learn is that ultimately everybody has the same goals: A better life, a better standard of living for their kids and themselves, a better future."

Zeldin's IQP team of five developed a design and education strategy for a biodiversity park. The students worked with Association Ribat Al Fath, an NGO that promotes sustainable living and environmental

learning while fostering Moroccan culture and heritage. Team members gathered information and interviewed farmers and teachers, among others, ultimately developing a 3D design for the proposed biopark, and identifying educational topics and methods to deliver them.

While the project center tends to attract students like Zeldin who are eager for an experience far from their everyday lives, living and working in Rabat brought robotics major Claire Sellen '20 closer to her family back home in the U.S. She'd been drawn to Morocco because her mother spent six months there while working on her master's thesis two decades ago.

"I grew up on all of these wonderful stories about her experience and there are pictures of Morocco all over the house," says Sellen. "When I found out there was a Morocco site at WPI, I knew I wanted to go."

Sellen was on a team of four who converted a paper record-keeping system into a computer database for Association Jannat, an NGO in Rabat that houses women undergoing cancer treatment. Team members worked with translators to interview patients, staff, and others—they built a Microsoft Access database and created a user manual and tutorials for the staff.

The students lived in a residence hall that, as it turns out, was just blocks away from the family who hosted Sellen's mother in the 1990s. Sellen reached out to the family and became a frequent dinner guest.

"They just took me into their home the way they took my mom in," Sellen says, adding that she was nervous when she first arrived in Morocco, but soon settled in. "It's really important to be open to trying new things ... we were told going into this that there could be cultural challenges. It was a really wonderful experience overall."

—SHARRON KAHN LUTTRELL

WTC

The latest in university news, research, and commendations

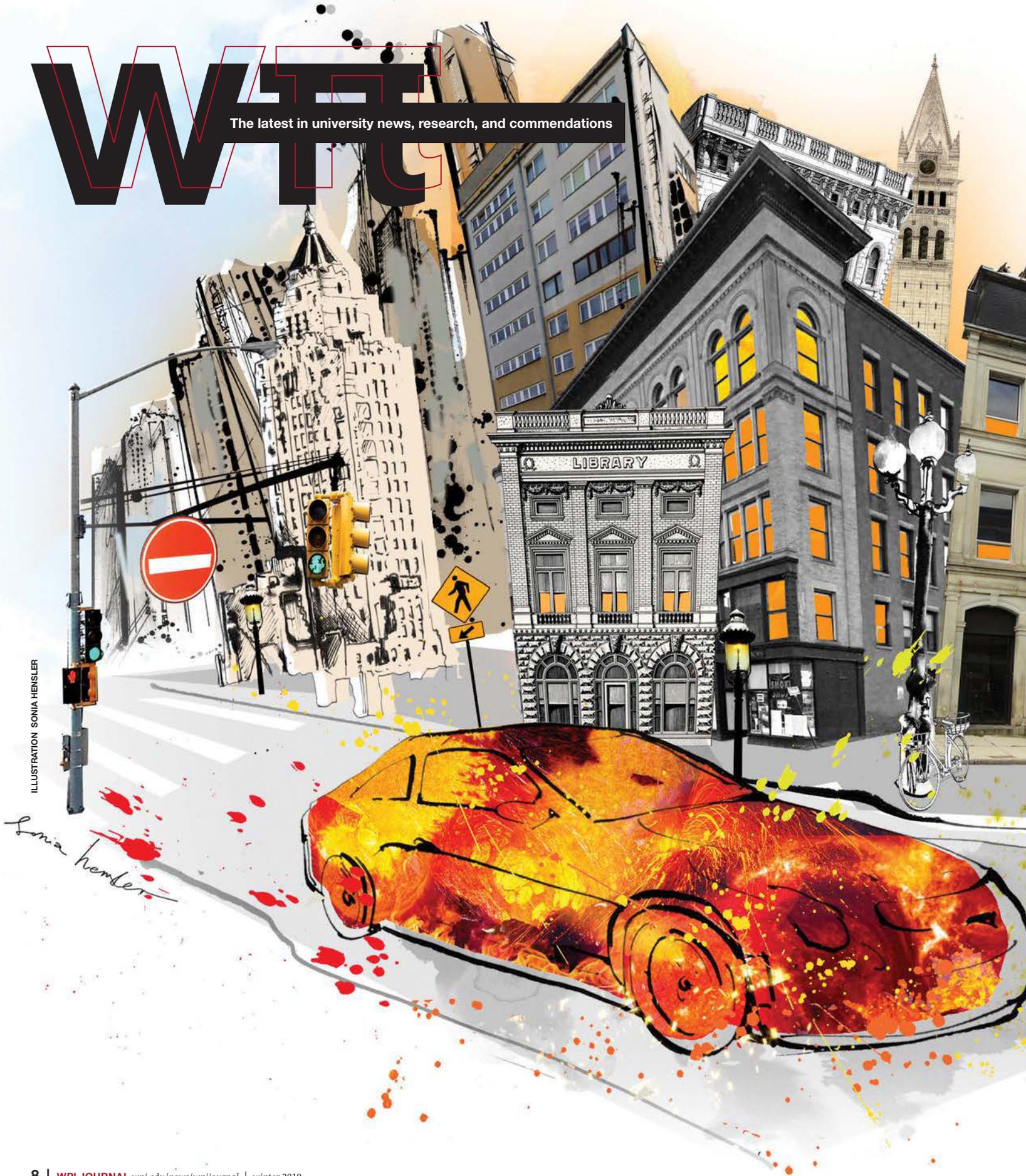
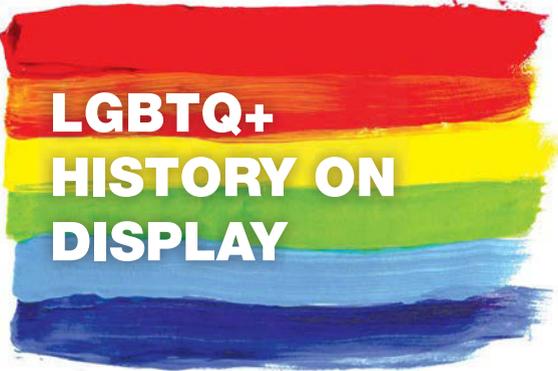


ILLUSTRATION SONIA HENSLE

Sonia Hensler



LGBTQ+ HISTORY ON DISPLAY

In 1974 WPI's student newspaper (then called *Newspeak*) published a letter announcing the formation of the Worcester Gay Union. Professor Joe Cullon points to a tattered membership card that was on display at the Worcester Historical Museum, along with other early artifacts of the city's gay liberation movement. He then points out a printed notice that documents the location of the Worcester group's monthly meetings at 19 Schussler Road—which was and still is WPI's Collegiate Religious Center.

Cullon, who teaches history at WPI and is director of the Digital Worcester online archive, is searching out these connections to trace WPI's own LGBTQ+ history. His trail of clues includes newspaper clippings, word-of-mouth contacts, and artifacts. Back issues of *Newspeak* reveal that WPI soon established its own alliance, which disbanded within a year, leaving the founders to lament that sustaining an organization for gay people at "Tech" was next to impossible when "people are afraid to join."

"The students behind the 1975 WPI Gay Alliance might have been the first to launch a group, but they were not the last," he says. In addition to combing through WPI's archives, he's recording oral histories from students, and interviewing faculty and staff members who've been named as allies to the students' cause.

"Before there was an office, or an institutional structure, where did they find support?" he asks. "And what does that tell us about the experience of LGBTQ+ students at WPI, and how they made WPI a better place?"

Cullon's research on WPI was inspired by his role as a guest curator (along with colleagues from Clark and Holy Cross), of an exhibit called "LGBTQ+ Worcester—For the Record" at the Worcester Historical Museum. He says, "Repeatedly, I was surprised with how WPI students, faculty, and staff turned up in this research, and realized that it is time to write a full history of LGBTQ+ WPI to document the triumphs and sometimes heartbreaking disappointments of young adults navigating their sexual and gender identities." In October, alumni and members of the WPI community were treated to a special tour of the exhibit, followed by a presentation and discussion.

Cullon embraces the work that lies ahead, and looks forward to more interactions with members of the Worcester and WPI communities. "This isn't a history that was being collected within the city; this wasn't a history that was getting enshrined or packaged for the Archives and Special Collections, he says. "It's a community-based effort to enlist people to preserve history that otherwise would be lost."

The WPI LGBTQ+ History Project invites alumni and other community members to share their stories and artifacts. Did you participate in the founding of LAGA or join Bi-LAGA during your time at WPI? Do you have old T-shirts, party invites, or meeting minutes relating to LGBTQ+ life on campus? If so, contact Joe Cullon, jcullon@wpi.edu, and ensure that this history is preserved.



SIZZLE IN THE CITY

If you thought it was unusually warm this past summer, you weren't wrong. Several northeast cities, including Boston, set a new record in July for the hottest month in history. In Worcester a team of citizen scientists, led by WPI faculty members, set out to determine just how hot the city gets in various areas—from the tops of its seven hills to the floors of its valleys. With specially designed thermal sensors mounted on their cars, they collected ambient temperature and location data. That information is being used to create a high-resolution map of ground-level temperatures in the city that will take into account the impact of land cover and topography.

Once the map is completed, it can be used as a planning tool to prioritize areas needing the most attention during a heat wave. Keeping cities cooler can involve a variety of actions—opening more public air-conditioned spaces, removing or whitewashing large areas of black asphalt on pavement or roof surfaces, adding more trees for shade, increasing areas of green space, and engaging in urban designs to increase natural airflow through hot neighborhoods.

Worcester is one of a number of communities in the country that have conducted or are planning to conduct similar heat mapping projects.

—COLLEEN WAMBACK

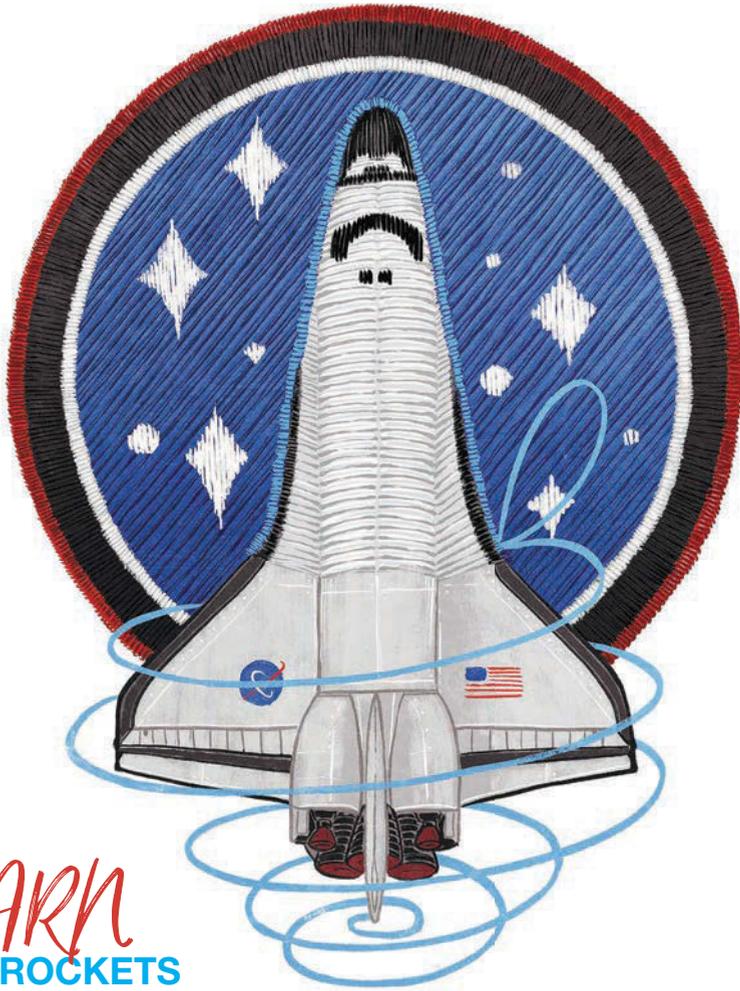


ILLUSTRATION SABRINA GABRIELLI

YARN AND ROCKETS

NASA plans to build more durable spacecraft to reach planets such as Mars – with the help of yarn and a few deep math calculations.

Randy Paffenroth is an associate professor of mathematical sciences, computer science, and data science at WPI as well as a sub-contractor to New Hampshire-based Nanocomp Technologies, which received an \$8.1 million contract from NASA to advance its manufacturing processes. He is combining old math formulas and new math techniques that will enable sensors used by Nanocomp to capture high-resolution images to find imperfections in a carbon-based advanced material known as Miralon. Ten times stronger than steel, Miralon yarns are lightweight and flexible and can be wrapped around structures such as rocket fuel tanks, giving them the strength to withstand high pressures.

In explaining his role, Paffenroth says he is taking what he calls “this fancy, cutting-edge neural network and adding in a 250-year-old mathematical tool known as the Fourier transform to improve image resolution.” He considers it “a set of eyeglasses for the neural network. It makes blurry objects clear to the algorithm.”

While many researchers are using super-resolution techniques for capturing physical images of objects, WPI’s techniques are more accurate than competing methods – so much so that the International Conference on Image, Video Processing, and Artificial Intelligence invited WPI researchers to present their findings at the conference in Shanghai, China, earlier this year.

“It’s really exciting,” says Paffenroth, “to use a combination of modern machine learning and classic math to make an impact on future space-related challenges.”

—ANDY BARON

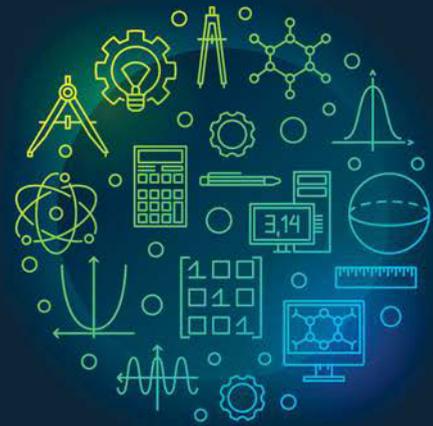
FIRST GEN SUCCESS

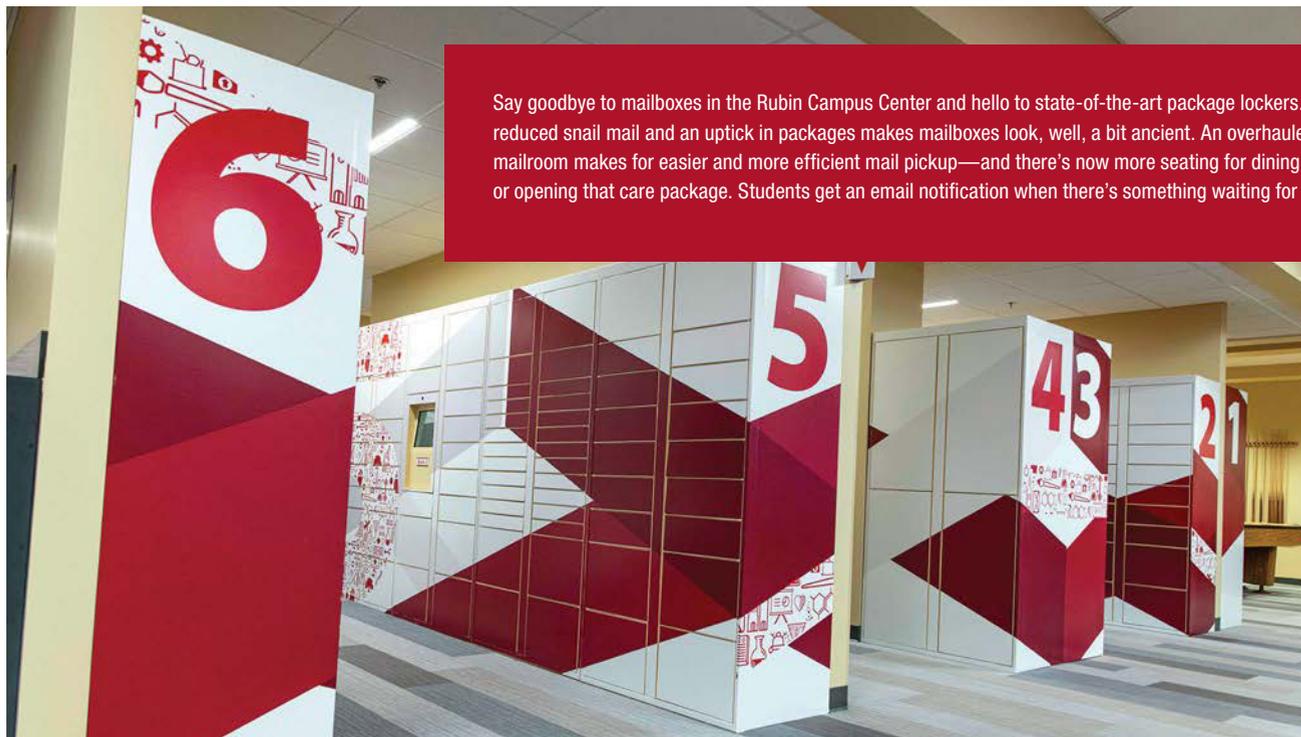
A recent \$1 million National Science Foundation S-STEM grant will help eligible first-generation Worcester Public School students navigate their studies at WPI and beyond. Two cohorts of 10 students each will begin with the first cohort in fall 2020.

“We are trying to support , gifted students from our own local community who surround our university, but who may not feel they have access to it,” says Tiffany Butler, teaching professor in biomedical engineering, director of the Office of Multicultural Affairs, and also the principal investigator on Connecting Mentor Partners for Academic Success of Undergraduates in Science, Engineering, and Mathematics. She notes that the grant extends WPI’s Great Minds Scholars Program. A high-caliber STEM education that includes appropriate supports like mentoring, access to research opportunities, and even living on-campus, can have lasting impact, says Butler, who works with co-investigators Kristin Tichenor, former senior vice president of enrollment management, and Kathy Chen, executive director of WPI’s STEM Education Center.

“If they are not fully engaged in the community, students can miss developing and establishing essential peer networks and critical support structures,” says Butler. “They miss the informal talk about internships, job opportunities, and professional development workshops—all the incremental tidbits that lead to success. We want to change that.”

—JULIA QUINN-SZCESUIL





Say goodbye to mailboxes in the Ruben Campus Center and hello to state-of-the-art package lockers. Drastically reduced snail mail and an uptick in packages makes mailboxes look, well, a bit ancient. An overhauled campus mailroom makes for easier and more efficient mail pickup—and there's now more seating for dining, studying, or opening that care package. Students get an email notification when there's something waiting for them.

ASK THE ARCHIVIST

I've heard that our mascot's namesake, Gompei Kuwada, Class of 1893, had a son who also attended WPI.

In the summer of 1926, Suenori Kuwada '30 made the long journey from his home in Hyogo-Ken, Japan, to Worcester to follow in the footsteps of his father. He lived with a classmate of Gompei's, Arthur Comins, while he received advanced tutoring in English before beginning fall classes in September.

A natural athlete and talented artist, Suenori was a popular classmate. In his first year, he helped keep his classmates dry during the traditional Freshman-Sophomore Rope Pull, which at the time was held across Institute Park's pond. He made a name for himself among the faculty for his acumen and near-whisper quiet voice. He would delight the campus with his elaborate blackboard drawings.

In his sophomore year, Suenori helped reorganize WPI's chapter of the Cosmopolitan Club, a national organization that helped foreign students feel more at home and share their native culture through dinner events, discussion groups, and informal gatherings. He joined the soccer team, where he impressed the Tech faithful with his competitive spirit. A music lover, he embraced American popular culture and attended many social events.

Suenori's time at WPI would soon turn tragic—a bout with influenza during that winter resulted in a weakened immune system. He fell victim to tuberculosis, receiving the diagnosis

just days before final exams were to begin. Ever dedicated, he insisted on taking the exams with his classmates before his guardian arranged for his treatment at a hospital in nearby Lunenburg [he was unfit to make the journey home to Japan]. His classmates and professors were frequent visitors but despite the outpouring of support, Suenori succumbed to his illness on May 1, 1929. At his funeral service, classmates from his father's fraternity served as his pallbearers in front of a large crowd of mourners that included faculty, students, and friends of both Suenori and Gompei. In their senior yearbook, his classmates prepared a touching tribute to Suenori's memory, writing that he would be “missed as long as his classmates hold Tech in memory.”



Arthur Carlson, assistant director of Archives & Special Collections at the George C. Gordon Library, would be glad to answer questions you may have regarding curious facts and figures about WPI wonders. Send your inquiry to archives@wpi.edu.



ILLUSTRATION LAPIN



A WIN-WIN FOR WPI AND WORCESTER'S NEW HOMETEAM

WPI expertise is guiding the development and design of a 21st century ballpark under construction for the Woo Sox. Polar Park, a 10,000-seat stadium that will be the new home to the Triple-A team, which is moving from Pawtucket, R.I., broke ground in July and is expected to open in 2021. The selection of WPI as the project's official academic technology advisor was announced in April by President Laurie Leshin and the team's principal owner and chairman, Larry Lucchino.

"One of the many appealing assets in Worcester is WPI, a world-class technology leader," Lucchino said. "We have long sought this collaboration to help this ballpark be innovative as well as friendly and beautiful. We look forward to WPI's participation on the key technology fronts."

Starting in the 2019–20 academic year and continuing through the 2023 baseball season, WPI teams will work on projects in the areas of user experience, smart design, virtual reality, robotics, data analytics, and mobile app development. President Leshin, commenting on opportunities for faculty and students, baseball fans, and the surrounding district, calls it "a win-win."

TRASH TALKING

China's 2018 decision to stop accepting recyclables from the United States sent shock waves through the recycling industry. The move has left municipalities with the hefty task of trying to figure out how to handle the tons of paper, plastic, metal, and other materials piling up in landfills. Meanwhile, a WPI faculty member is studying the problem as an opportunity to revamp the recycling process. **Berk Calli**, associate professor of computer science and robotics engineering, has received a four-year, \$2.5 million grant from the National Science Foundation's "Future of Work at the Human-Technology Frontier" program. Calli, along with researchers at Yale and Boston University, will design what could be the recycling plant of the future. The project aims to integrate new technologies and the existing workforce with an emphasis on keeping and elevating human tasks with robotic support to make the process more efficient, profitable, and safer. The project includes faculty and students from several disciplines, including mechanical engineering, environmental and material sciences, and computer science and robotics.

—COLLEEN WAMBACK

OFFICE OF TECHNOLOGY COMMERCIALIZATION

IT'S NO SECRET—INNOVATION IS THE BASE OF WPI'S FOUNDATION

Thanks in large part to the targeted efforts of WPI's Office of Technology Commercialization (OTC), WPI's track record for marketable products is surpassing previous university benchmarks and with percentages that are higher than at many other universities. This year brings 70 new invention disclosures, 20 patents successfully licensed through the OTC, nine more potentially licensed patents in the pipeline, and designation as a National Science Foundation I-Corps site.

Todd Keiller, director of the OTC, says the success came from careful planning and a targeted strategy that has commercializa-

tion as the end goal. "We ask, 'Is there a commercial pathway here?' If not and if there's no interest," he says, "we don't keep spending the money to pursue it."

A growth-focused mindset extends far beyond campus—leading to industry and job increases in the Worcester region as well. Thus far, Keiller says, 16 start-ups have created more than 50 jobs and raised \$15 million for the local economy.

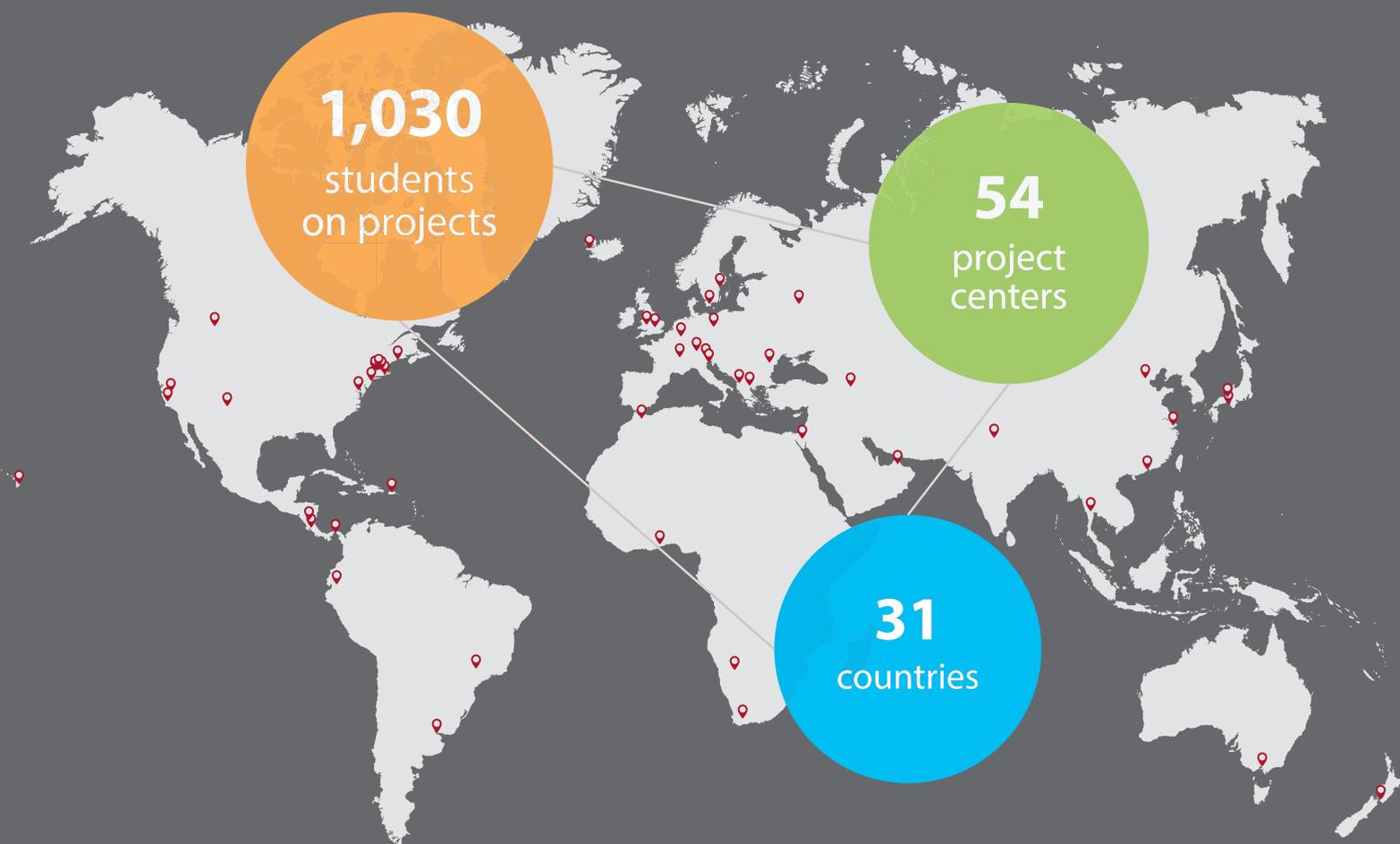
WPI's innovators trust the innovation & entrepreneurship (I&E) process, knowing the support, guidance, and encouragement to commercialize their product (or to pivot instead) can only increase the impact of their

work. Successful inventor Gregory Fischer, a robotics engineering professor and director of PracticePoint—a membership-based research, development, and commercialization alliance founded to advance healthcare technologies—says being able to focus on meaningful work and knowing it has serious potential in the wider market is exciting.

"Innovation has costs both in time and in money," says Fischer. "Some schools are very conservative regarding what they will file. WPI is willing to invest in entrepreneurship, invest in technology, and protect both."

—JULIA QUINN-SZCESUIL

Of the 2019 graduates, 80% of students completed at least one off-campus project during their WPI career.



FACULTY

SNAPSHOT



Destin Heilman

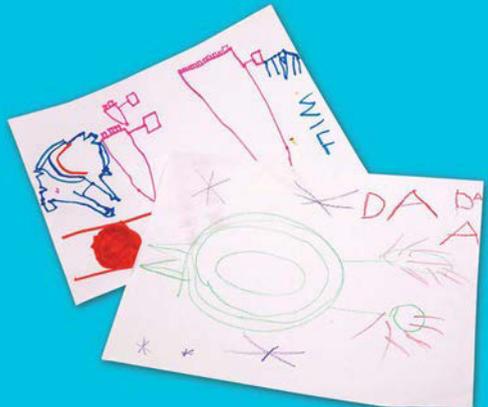
ASSOCIATE TEACHING PROFESSOR,
CHEMISTRY AND BIOCHEMISTRY DIRECTOR,
UMASS MEDICAL SCHOOL PROJECT CENTER

PHOTO PAT O'CONNOR

In my office



[1]



[2]



[3]



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[8]

1. INSIGHT: I've been an Insight advisor for 14 years (in 2013 I was honored with the Trustees' Award for Outstanding Academic Advising). When NSO rolls around, this swag serves as a reminder of what an amazing program it is.

2. ARTWORK: My son's early rendition of the starship *Enterprise*, and his rendition of a *Star Wars* battle scene—I hung these in my office several years ago and can't bring myself to change them out.

3. HANDMADE WOODEN CLOCK: Not long after I started at WPI a student suggested that I read *Longitude* by Dava Sobel. The book inspired me to take a stab at wooden clock making. I built this one as a prototype for one that I made for my parents' 50th wedding anniversary. Since then I've built a variety of clocks of different designs.

4. ASTROPHOTOGRAPHY: A few years ago I built a custom imaging observatory at my home. This photo of the Heart Nebula in the constellation of Cassiopeia represents more than 24 hours of exposure time. I remotely control the observatory for WPI programs, especially for Insight and the WPI Astronomy Club (which I serve as faculty advisor).

5. GRAB AND GO TELESCOPE: Astronomers like to say that "the best telescope you own is the one you use." I use this one throughout the year for pop-up astronomy sessions across campus. In 2017 we used it to watch the solar eclipse from the Fountain during NSO.

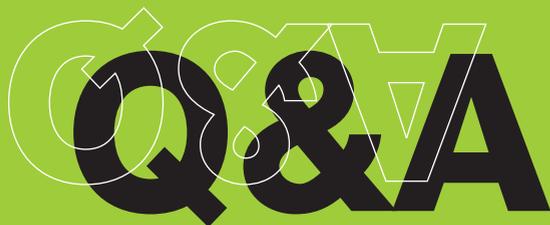
6. MY TOYS: I keep a lot of toys in my office as a reminder to keep things fun and lighthearted. They serve as a great conversation starter for new students who visit my office. After all, I'm an awesome nerd, too!

7. 3D PRINTED PROTEINS: The structure of the virus proteins I study in my lab cannot be determined by traditional methods. A few years ago, one of my MQP teams decided to computer-model the structures and 3D print parts of them to see if they might bind to components of the cell. It was an amazing project! Now they double as super-fancy expensive paperweights!

8. NATURE, GENOME ISSUE: What was projected to take 50 years to complete took only 11 years: In February 2001 the first draft DNA sequence of the human genome was published—90 percent of the 3.2 billion base pair code. I've kept this issue of *Nature* on my desk since that day, as a reminder of human accomplishment and a placemat for the molecular modeling kits that students fiddle with while we're talking.



PHOTO: PAT O'CONNOR



Michael Wilson '01 and
Emily Nodine '04, founders,
Maine Craft Cannabis

Maine Craft Cannabis is a licensed and fully compliant medical marijuana company that grows organic cannabis for sale directly to patients and by wholesale to storefronts in Southern and Central Maine. Owners Michael Wilson and Emily Nodine met at WPI, married in 2015, and launched their business last year. As their website puts it, “We’re both former mechanical engineers who grew tired of sitting at a desk all day and wanted to do something we felt more passionate about.”

You moved from high-paying engineering jobs in Boston to become farmers in rural Maine. What sparked this career and lifestyle change?

The first leap was our decision to move somewhere where we could create the life we really wanted, instead of making decisions based on our careers. A couple of years later we went to a local cannabis expo out of sheer curiosity, and the first person we met was a WPI alum—Mike Matton '91, who was promoting a CO₂ extraction system he developed at High Purity Extractions. That opened our eyes to the opportunities to apply our engineering skills in this new industry. We decided on that very day that we wanted to find a way in. Then Michael had an opportunity to do a lighting system design analysis for a local grower, and we became aware of the technical complexities involved in indoor growing. Starting our own company gave us a way to learn the industry from the ground up.

How do your engineering roots tie into your operations?

We take a very scientific/engineering approach to growing. We do controlled experiments as often as possible when we change a variable, and we keep detailed notes. Indoor agriculture can be looked at as a closed-system optimization problem that includes lighting, temperature, humidity,

CO₂, soil, plant matter, and water. It's all about adjusting inputs and outputs to optimize quality and yield. We use systems engineering, thermodynamics, electrical engineering, and design for manufacturability quite often in maintaining and optimizing our facility and systems. One of the cool things about indoor growing is that it really is the marriage of high-end technology and biology/nature. When it's all working together, the result is just beautiful.

Our WPI education, particularly the projects program, really prepared us well to be business owners. On a day-to-day basis, nobody is telling us what to do or even exactly what the end goal is. The problem is often pretty undefined, and we need to create structure by identifying key issues and approaching each of those analytically.

How would you define “craft” cannabis? What special things do you do for your plants, and how do they pay off?

Most mass-market cannabis is grown using hydroponics and salt-based bottled nutrient products. We grow our product completely organically in living soil that is active with all kinds of life, including bacteria, fungi, nematodes, and arthropods. We believe that growing in soil creates the cleanest and most flavorful product possible. You can think of the difference between organic, soil-grown cannabis and hydroponically grown cannabis as a nice, ripe, organic

farmstand tomato, compared to a giant shiny commercially produced tomato.

We always prioritize quality over yield, and while this is challenging from a business perspective, we're definitely seeing a lot of interest in products that are grown transparently and ethically, and at the end of the day that makes it all worth it!

You speak of a stigma around this industry. What will it take to change that?

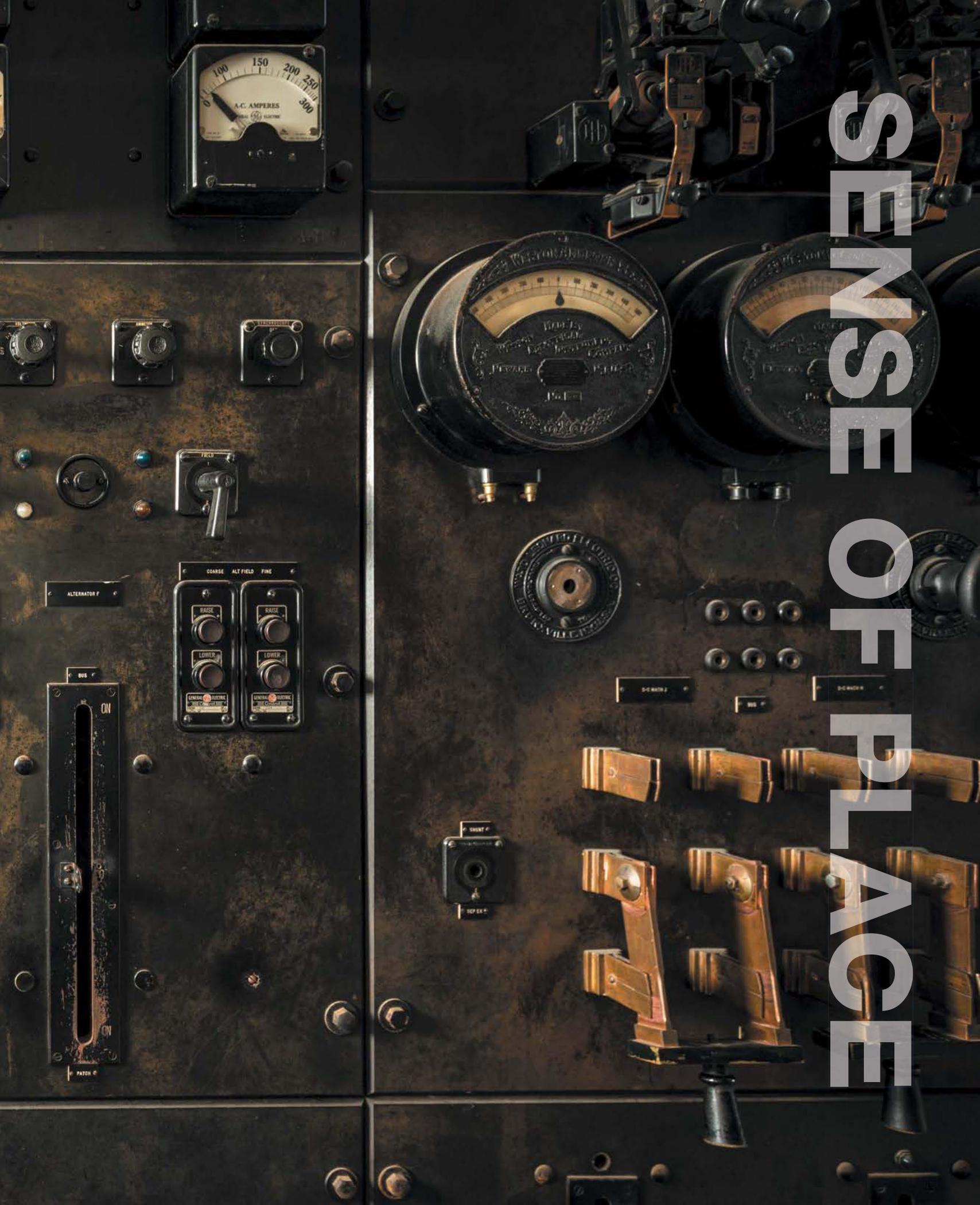
Since we've started to educate ourselves on the facts, we've been appalled about how much misinformation there is out there and how misunderstood cannabis really is by the general public. As we leave this era of prohibition, we hope that people can take a little bit of a leap of faith and be willing to challenge their assumptions about cannabis. It's extremely safe. It has substantial medical benefits. However, cannabis doesn't just help people who are sick. People tend to think of cannabis as either medical or “recreational” (adult use), but there's a huge area in between that we'll call “wellness,” for lack of a better term. Cannabis is hugely helpful for things like sleep support, reducing anxiety, and treating minor aches and pains. We see huge promise for it as an alternative to pharmaceuticals as trustworthy products becomes more accessible on the legal market.



ONCE, ELECTRICAL ENGINEERS WORKED WITH BIG THINGS: MONSTROUS MOTORS AND GENERATORS, AND HEFTY SWITCHES TO CONTROL THEM. THIS CONTROL PANEL IS ALL THAT REMAINS OF THE EQUIPMENT THAT ONCE SPARKED STUDENTS' IMAGINATIONS IN WPI'S ATWATER KENT LABS, THE NATION'S FIRST DEDICATED EE BUILDING.

PHOTO SCOTT ERB, DONNA DUFAULT

SENSE OF PLACE







Ijeoma Ezeonyebuchi '14

Seamless Application:
**Supporting
NPR's mobile
platform**

By
Amy Crawford

Photography
Matt Furman



It's a feeling familiar to any fan of public radio—you might know their voices intimately, but when you see a picture of, say, Renée Montagne, Steve Inskeep, Terry Gross, or Ira Glass, you experience a moment of disorientation. “*That’s* what he looks like?” you might say to yourself. Or, “I always pictured her taller.”

FOR IJEOMA EZEONYEBUCHI, a quality assurance engineer working on the National Public Radio app at the radio producer’s Washington, D.C., headquarters, that happens all the time.

“Before I worked at NPR, I listened to it on the radio,” she says. “But now I’ll be in an elevator and hear someone’s voice and I’m like, ‘Oh, that voice sounds so familiar.’ And it’s Sam Sanders, or Guy Raz. When you hear a voice on the radio, you don’t really imagine a face—they’re just on that pedestal, as ‘the Voice.’ And you might think, ‘Oh, this person is probably very polished and together, they know everything,’ but when you meet in person, they’re like a regular human being, just a really nice person who knows a lot of interesting stuff.”

There might be fewer surprises now that Ezeonyebuchi has been at NPR for four years, but every day still holds new experiences for the electrical and computer engineering major, who now finds herself surrounded by top journalists reporting national and international news. (She still thrills, for example, at the appearance of cultural figures like Grammy-winning R&B artist Brandy, who pops in regularly for interviews or concerts.) As a daughter of Nigerian immigrants with a passion for music, and for teaching others to code, it makes sense that she would wind up at a radio station, using her tech skills to help NPR’s 37.8 million listeners make better sense of their world.

“Working on this app, we have to make sure what we’re doing is valuable,” she says. “It can’t be just, ‘Is your app flashy?’ or ‘Does it look nice?’ People are out there using it, and what you do informs the public. It has to help people get the news wherever they are, extend their experiences, and find great stories.”

■ UNKNOWN VARIABLES

NPR first released its app in 2009, when smartphones were still fairly new. By 2018, when NPR completed a significant redesign, the app had more than a million monthly users, whose experience needed to be seamless regardless of which phone they were on, which operating system they were using, or which local radio station they wanted to listen to through the app. And that’s where quality assurance comes in.

“I participate in a lot of the early discussions about new features,” Ezeonyebuchi explains. “I ask a lot of questions about how the change might work, how we’ll test it. I think about scenarios that the users are actually going to go through, to make sure we’re accounting for that prior to development. We’re basically trying to plan what the user might do before the feature exists. A lot of times we have a generic idea of what to expect, but not a definite idea.”

There’s a lot an app developer can’t control, she notes, including not only user behavior but how the app interacts with other apps or

with the user’s operating system. “A lot of that stuff you don’t discover until you have something working in your hand, to kind of play around with. Our biggest challenge is figuring out—as much as we can—what could go wrong before something even exists. We have to think about all these variables that might come into it, from the manufacturer of someone’s phone to how they’re using it.”

Ezeonyebuchi works with about 10 other engineers, and while hours are flexible and the atmosphere relaxed, they hold themselves accountable to one another with daily “scrum” meetings, where they share updates about what they’ve accomplished, what worked and what didn’t, and what challenges they’re tackling next.

“It’s all very collaborative,” she says. “I might be assigned something that needs input from the editorial team or the design team or the product team. And the quality assurance engineers all sit relatively close together, so we’ll have a lot of ad hoc discussions where we troubleshoot and figure out how to make things work. Everyone is pretty passionate about the work they do here, and there are always opportunities to put two heads together, instead of just putting the responsibility on one person’s shoulders.”

■ NEW DIRECTIONS

Working together toward a common goal comes naturally to Ezeonyebuchi, one of six children of a nurse and an IT worker. Like so many immigrants, her parents sacrificed and strove to give their children a good life, and it was simply an expectation that each would do their part by succeeding at school and attending college.

“My parents always imbued in us the idea that if you work hard, you’ll go far,” she says. “I never thought about not going to college. My siblings and I all have our degrees now—I have a sister who does pharmacy, a couple siblings doing business, a brother who did public health, and one of my sisters is going law school. I’m the only one in tech.”

Ezeonyebuchi originally considered majoring in foreign languages or economics, but after she had submitted several college applications, she realized that one of her favorite high school experiences had been participating in a robotics program—and what she really wanted was to study science and technology. “So I had to rethink my plan,” she says. “I had applied to all my other schools, but I needed a technical school.” Serendipitously, an application for WPI arrived in the mail. “I don’t even know how they figured out about me,” she says with a laugh. “But I got a scholarship.”

With her parents’ strong encouragement, she accepted the offer.

“And I was pleased with my choice,” she says. “The academics were hard, but there were so many things I learned at WPI. I was very grateful for the small class sizes—that was an experience a lot of my

friends at other colleges didn't have. They went to big campuses where there was not as much of an opportunity to talk with professors. But at WPI, if I didn't understand something, I would hit up the professor's office, and I found that was a really good way to kind of get to know them."

Pep talks from her MQP advisor, Professor Alexander Emanuel, still help her during tough times. "I had an exam that I just didn't do that well on one day," she recalls. "And that was the point I really realized engineering was hard. I was sitting in the hallway, and Professor Emanuel comes by and asks me how it's going. I was like, 'Oh, not too well.' And he said, 'You know what? You can do it. You can do anything you put your mind to. This is not the greatest challenge you'll ever face.' I think the fact that I had professors that were willing to say stuff like that really helped."

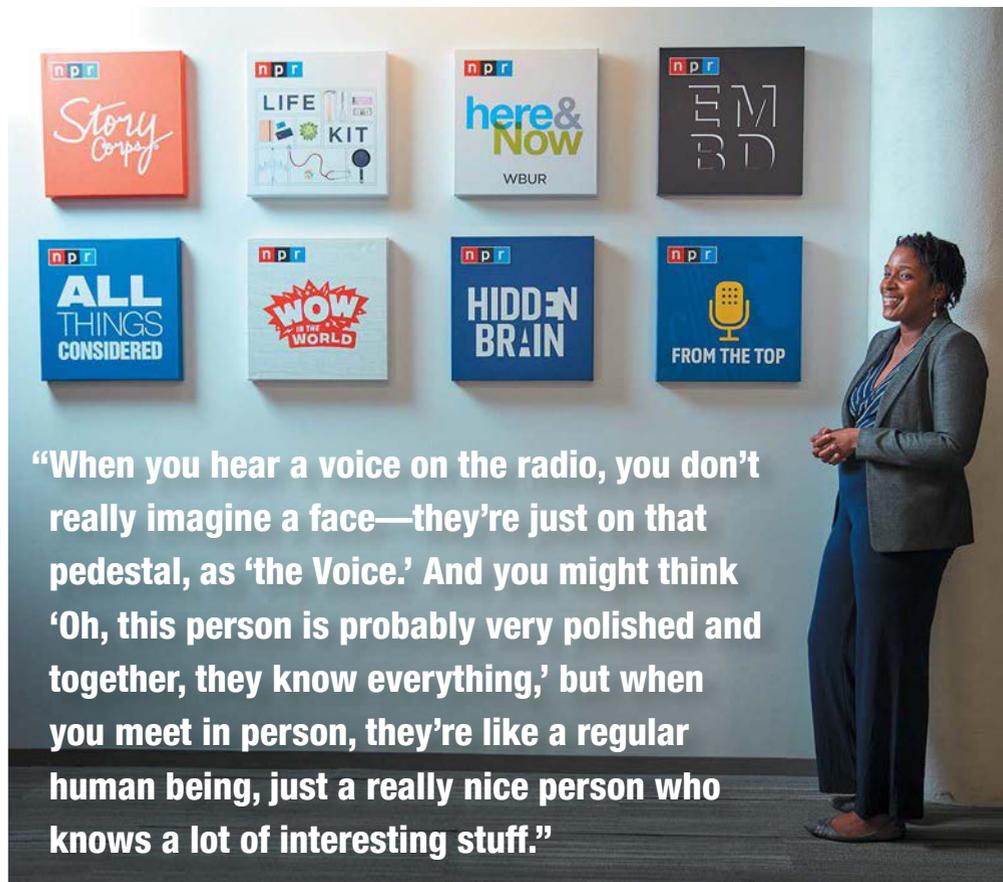
Emanuel and other professors also encouraged her to always be willing to learn new things—a useful attitude, since Ezeonyebuchi was not, at the time, sure what direction her career would take after graduation. But it was with a spirit of open-mindedness that she approached everything on campus—including serving as a tour guide.

"That's how I learned how to master walking backwards," she quips. "Although I've never had any other practical use for it!"

But, in all seriousness, she explains that the job pushed her to step outside her comfort zone. "I was always a little bit more introverted, so I felt like it would be a good opportunity for me get better at public speaking. Which did help, I guess, because now I'm speaking at conferences."

■ DIVERSIFYING TECH

For a woman who once considered herself "reserved," Ezeonyebuchi spends a surprising amount of time talking to strangers. Last year, for example, she was a "camp counselor" at THAT Conference: Summer Camp for Geeks—where she gave a talk about diversity and inclusion in tech. As a woman of color, an identity doubly underrepresented in the industry, Ezeonyebuchi knows what she's talking about when she tells conference attendees, "You can't build for multiple audiences if everyone looks the same." And diversifying tech is also a goal that drives her to volunteer with the nonprofit



"When you hear a voice on the radio, you don't really imagine a face—they're just on that pedestal, as 'the Voice.' And you might think 'Oh, this person is probably very polished and together, they know everything,' but when you meet in person, they're like a regular human being, just a really nice person who knows a lot of interesting stuff."

Women Who Code, for which she hosts workshops on java programming and mobile development for Android.

"My involvement started just as a way to keep sharp at skills," she says. "But after going to a few meet-ups, they asked, 'Would you be interested in volunteering?' My first response was, 'I don't know anything,' but I said yes anyway."

Four years in, she has found that leading coding workshops exposes her to a greater variety of people than she might otherwise encounter.

"You never know who you're going to get in the door," she says. "You get to hear people's stories about coming into the tech scene from a lot of different backgrounds. There was someone who worked at NASA for 15 years and built all these exciting things and just wants to learn something else on the side. I met a woman once who was really interested in building apps for language learning. I've seen people who are just out of high school, to women in their forties to fifties. Some are just starting to use computers. And it's a very valuable thing, to have the opportunity to see people grow."

Serving as a mentor also has Ezeonyebuchi contemplating her own future. While she enjoys her work at NPR, and she knows she wants to continue volunteering and speaking at conferences, she is also beginning to imagine herself in an academic role, either at the middle school or high school level or in higher education, where she might, one day, pass along some of the advice she got from her WPI mentors.

"I'm still trying to figure it all out," she says, "but one thing I do know is that I want to inspire the next generation." [J]

CHRISTOPHER JAMES '78

SPEAKING

Green

BY JOAN KILLOUGH-MILLER
PHOTOGRAPHY MATT FURMAN



POLLUTED AREAS, SUCH AS THIS INDUSTRIAL PART OF TACOMA, ARE WHAT JAMES CALLS THE OMEGA TO THE ALPHA OF OLD GROWTH FORESTS. "POLLUTION AND VISIBLE DECAY MAKE US RECOIL AND LEAD TO NEGATIVE THOUGHTS — THEY'RE SIGNS OF GROSS INEFFICIENCY." BUT HE ALSO SEES HOPE IN THESE AREAS, AS THEY OFTEN BLOSSOM WHEN REDEVELOPED, SERVING TO SITE HOUSING, PARKS, AND BUSINESSES.

In 2011, when the daily news was filled with photos from Beijing of citizens garbed in face masks to protect against life-threatening air pollution, President Obama's new appointee to the Environmental Protection Agency flew into town. It was the first visit for Gina McCarthy, who was then Assistant Administrator for the EPA Office of Air and Radiation.

The whole world was watching, and a bevy of dignitaries and consultants were on hand to guide her through the visit. Among them was Christopher James '78. In addition to his official duties—which included developing McCarthy's agenda for meetings with high-level officials, and preparing briefs on technical data—James and a colleague smuggled the soon-to-be EPA chief out of her air-conditioned five-star hotel, away from the eyes of the media, for an early morning bike ride through the city's hutongs (ancient back alleys). Her unofficial tour, astride a borrowed one-speed bicycle, included food markets with live frogs squirming in moist bins, local beer at the city's brew pubs, plus a stop here and there for a pickup game of streetside ping-pong.

"I wanted to show her the real Beijing, which she wouldn't see in her tightly scripted agenda," James says. It helped that the two already knew each other well—she'd been his boss in his previous post with the DEP in Connecticut.

That kind of junket isn't a part of James's typical task list in his job as Principal, China Programs, for the Regulatory Assistance Project (RAP). But it's totally in line with the independent, non-partisan, NGO's ethic of finding flexible, responsive ways to help governments around the world set sound, sustainable energy policy.

James has been traveling to China from his home in Tacoma, Wash., a few times a year for over a decade. The 2011 mission stands out as more than just a lark. It marked the beginning of a dramatic turnaround in Chinese environmental policy: the government stopped denying its "crazy bad" air quality and made a public commitment to address it.

HOW A MECHANICAL ENGINEER LEARNED TO RAP

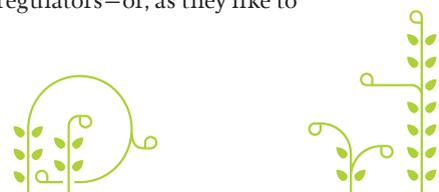
James had worked with RAP before he became part of it. He was recruited from his DEP post, where he managed air planning and energy programs for the state of Connecticut back in 2007. "At the time, China was a blank canvas," he says. "Think about the wildest, most innovative idea you've ever had in your life—it doesn't matter how crazy someone in the U.S. might think it is. Multiply it by a factor of 10, and you're just getting into the ballpark of the type of approach you can take in China. It was really an exciting, fascinating place to start working in."

These days, he says, "There's no such thing as a climate change denier in China, where the air quality is so bad that people are dying, literally." When James arrived in Beijing near the end of 2011, the government was loudly disputing the accuracy of the U.S. Embassy's "beyond index" measurements of PM 2.5 (particulate matter finer than 2.5 microns, which causes respiratory damage). He compares the turnaround that occurred in those weeks with Gina McCarthy to the early steps of a 12-step program. "First they denied there was a problem; then it was like, OK, there's a problem, but it's not our fault." (Blame was usually laid on the industrialized western nations.) By the end of that visit there was open acknowledgement of the air quality problem, and a public commitment to install monitors, set standards, and devote national resources to solutions.

Today, China has even stricter air pollution policies that hold public officials personally accountable for failures. James helped draft the new laws, which were adopted by the National People's Congress.

Wherever his work takes him—from Asia to Europe and throughout the United States—James carries several "passports" that give him credibility in the universe of government regulators. The first is his WPI degree in mechanical engineering. "We can talk geek if we have to," he says of himself and most of RAP's staff. "It engenders trust; people say, 'OK this guy is not just some policy wonk,' because they see that we actually understand how things work."

Being a policy wonk helps too. All RAP's senior associates and principals have held posts as energy and environmental regulators—or, as they like to



“WE DO A LOT OF BACKGROUND RESEARCH ON WHAT’S BEEN DONE BEFORE, WHAT WORKED, AND WHAT DIDN’T. ONCE WE DECIDE TO GO IN, WE’RE THERE FOR THE LONG TERM.”

point out in presentations, “We have been you.” James explains, “We understand the political dynamics they face, and the pressures from the public. We’ve dealt with legislatures and courts, and we can recommend pathways for implementations and enforcement.”

On top of that, he brings a devotion to the environment that dates back almost five decades, to the first Earth Day. A devoted Boy Scout, who was a card-carrying member of a local Audubon Society chapter in childhood, James came to WPI in the mid-’70s with a vision of working in solar energy. “Back then there was just this nascent idea about solar and photovoltaics, and the concept of generating electricity from the sun was still very, very ‘specialized,’” he notes.

The newborn WPI Plan let him delve deep into that emerging specialty. His IQP took him all over New England to evaluate existing solar water heaters. His MQP delivered a low-cost thermal solar unit with a parabolic reflector that could be pulled on a wheeled platform. “It got the temperature up more than hot enough for dishwashing,” he says with pride. “We thought it could be useful in places where hot water, or even electricity, was a luxury.”

A decade later, environmental studies had bloomed as an academic field. James’s MS from Brown University was fully funded by the EPA, under an arrangement similar to ROTC. His thesis

JAMES HAS A CYCLING GOAL OF 10,000 KILOMETERS A YEAR (6,214 MILES). “I BICYCLE MORE THAN I DRIVE EACH YEAR.”



measured airborne pollutants from medical incinerators, including mercury and particulate matter. It helped set new standards for cleaner disposal of medical waste. Today he's working on a wider scale to help policymakers find clean and efficient ways to power the world.

A LAYER CAKE

Underlying RAP's work is the principle that energy and environment are inextricably linked. "Efficiency triggers so many other possibilities and has so many other benefits," James says. RAP literature speaks of a "layer cake of benefits," topped with "feel-good frosting." He points out that improving energy efficiency not only lowers bills for consumers—it can also improve health (through reduced emissions) and the local economy (by averting the need to build additional generators and transmission lines). "We've got to talk about cost, because cost matters. Consumers matter. Somebody's got to pay the bills, whether it's people like you and me, or businesses."

His grounding in looking for creative ways to solve multiple problems, rather than pitting them against each other, goes back to the WPI Plan, James says. His work in the humanities—he studied composers of the Romantic period—and Professor Bob Wagner's WinterSession mountaineering expeditions shaped his world view. He was taken all the way back to his engineering roots recently when problems arose in an air pollution monitoring system in China. "I opened my *Fluid Dynamics* text from WPI. That scraped some of the rust off the brain! Even though it's from the 1970s, the basic equations—laminar flow, turbulent flow, heat transfer—are still the same.

"It helped me engage in a pretty detailed engineering consult about what was required to get those electronic precipitators installed and operating," he says, adding, "It's not enough just to put a control device in, you have to make sure they're all operating and maintained so they're working properly. That gets into a lot of engineering principles."

Although he's had some formal training in negotiation and mediation, much of those skills were learned on the job. Making good policy—and adapting it locally—takes good listening and sensitivity to the local ethos. For example, when working on an air quality plan in Krakow, Poland, James says that leaders there looked up to China as a role model. Mentioning Germany's good work on those issues was not good strategy, because of leftover sentiments from World War II.

"Before we go into a venue," he says, "we do a lot of background research on what's been done before, what worked, and what didn't. Once we decide to go in, we're there for the long term. We work for as many weeks, months, or years as it takes to address their problem. It's not enough just to get a law on the books. You also have to make

sure the government can implement and enforce that law. Unless you do, you have no guarantee that that law will meet its objectives."

A relatively new domestic project for James, funded by the Robert Wood Johnson Foundation, looks at economic injustice in the energy sector. For example, utility companies' fixed rate structures can unfairly impact low-income customers. Poorly insulated rental housing with cheaper, less efficient appliances can deny savings accessible to wealthier customers. RAP is also looking at ways to bring doctors and other healthcare providers into the conversations, because the environment is an important component of wellness.

The holistic philosophy—and the vibe—of RAP suits him well. "It's a fun place to work, people are jazzed," he says. "When we gather from all over the globe for meetings, we stay up late and play music together." Likewise, he embraces the quality of life in the beautiful Pacific Northwest, where he works from home and gets around by bike as much as he can. His house—almost 100 years old—is topped with 12 solar panels. "Even in cloudy western Washington, we generate more electricity than we use."

Pointing to the growth of innovative utility programs that reward customers willing to help optimize load, and his own "seamless" experience with renewable energy, James says. "Some people still have a perception that there is a sacrifice [to energy efficiency], but there isn't. At RAP we think in terms of entire systems and all the benefits. I'm happy that my WPI education laid an excellent foundation and world view of how things work, and how to apply that knowledge to help people live better." [\[J\]](#)



In each issue you'll see how WPI students put theory into practice through projects.

PROJECTS

THE PROJECT

Analysis of the Potential Endangerment of Immigrants Due to Merit-Based Immigration

AUTHOR, Neel Dhanaraj '20, Mechanical Engineering/Robotics Engineering
ADVISOR, Jennifer McWeeny, associate professor of philosophy

This capstone project is a Humanities & Arts requirement designed to support a student's self-designed and independent scholarly research. It was a 2018 Winner (1 of 3) of the Class of 1879 Prize.

THE BIG IDEA

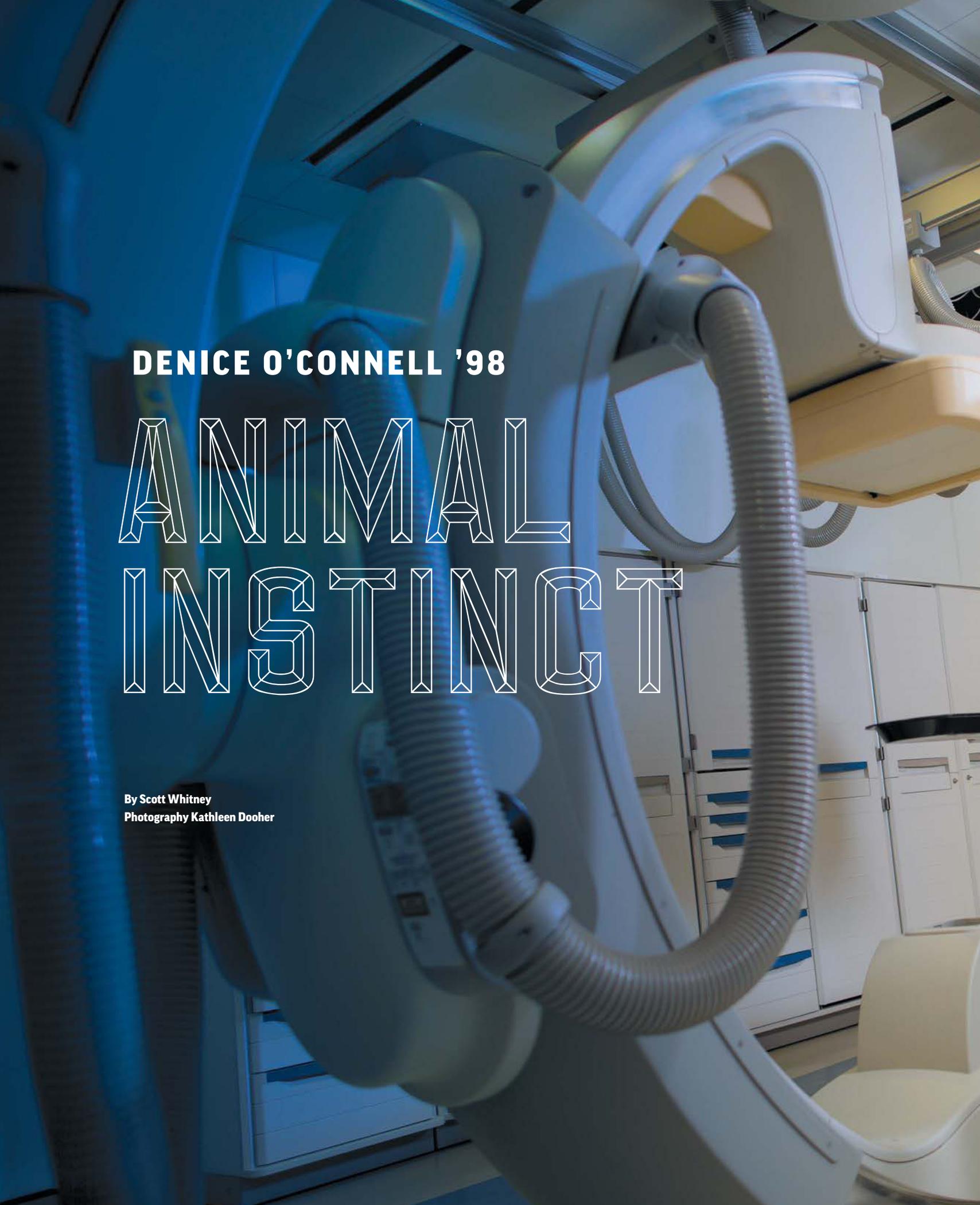
Dhanaraj participated in an Inquiry Seminar in philosophy and religion, titled "Endangered Bodies." He chose to write his research paper on the ways that immigrant populations are endangered in the contemporary world. His findings show how merit-based immigration could actually hurt the nation.

THE ARGUMENT

Although merit-based immigration appears to be a system that is fair to all individuals, when considered closely there are many ways that this practice can devalue immigrants. The points system requirements foster a conception of immigrants as mere commodities and resources that a country can expend. In addition, it can discriminate against foreigners who do not mirror dominant American social identities in terms of race, culture, and class. If a merit-based immigration law causes immigrants to be perceived in these ways, it may indirectly encourage people to have xenophobic ideas and may ostracize immigrants civically. All three consequences dehumanize immigrant bodies and have costs to society.

RECOMMENDATIONS

Dhanaraj suggests that countries should engineer immigration policies grounded in notions of humanity rather than commodity. If a system were implemented that encouraged citizens to value the humanity of immigrants and their civic inclusion, they would be able to contribute more to the country, both economically and socially.



DENICE O'CONNELL '98

**ANIMAL
INSTINCT**

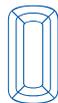
**By Scott Whitney
Photography Kathleen Doohar**



O'CONNELL TALKS WITH MATTHEW GOUNIS, MD, A PROFESSOR IN THE DEPARTMENT OF RADIOLOGY AND DIRECTOR OF THE NEW ENGLAND CENTER FOR STROKE RESEARCH AT UMASS MEDICAL SCHOOL. THE TWO COLLABORATED ON THE NOVEL APPLICATION OF A RETRIEVABLE INTRACRANIAL STENT, WHICH HAS REVOLUTIONIZED THE CLINICAL APPROACH TO VASCULAR FOREIGN BODY AND CLOT REMOVAL, AMONG OTHER DISCOVERIES.

FOR DENICE O'CONNELL, BRIDGING THE WORLDS OF VETERINARY MEDICINE AND MEDICAL RESEARCH IS NOT ALWAYS A COMFORTABLE SPACE TO OCCUPY.

“HOW DO YOU SPEND ALL THESE YEARS STUDYING TO SAVE THE LIVES OF ANIMALS, AND THEN UTILIZE ANIMALS TO ANSWER SCIENTIFIC QUESTIONS?—THAT’S THE QUESTION I’M ASKED MOST OF ALL.”



O’Connell, a veterinarian dedicated to supporting animal welfare, oversees animal testing for a global pharmaceutical company.

She is a committed advocate for every animal in her care — she is equally committed to the potential cures and discoveries that studying these animals may unlock.

By her own admission, bridging the worlds of veterinary medicine and medical research is not always a comfortable space to occupy. “How do you spend all these years studying to save the lives of animals, and then utilize animals to answer scientific questions?” she acknowledges. “That’s the question I’m asked most of all.”

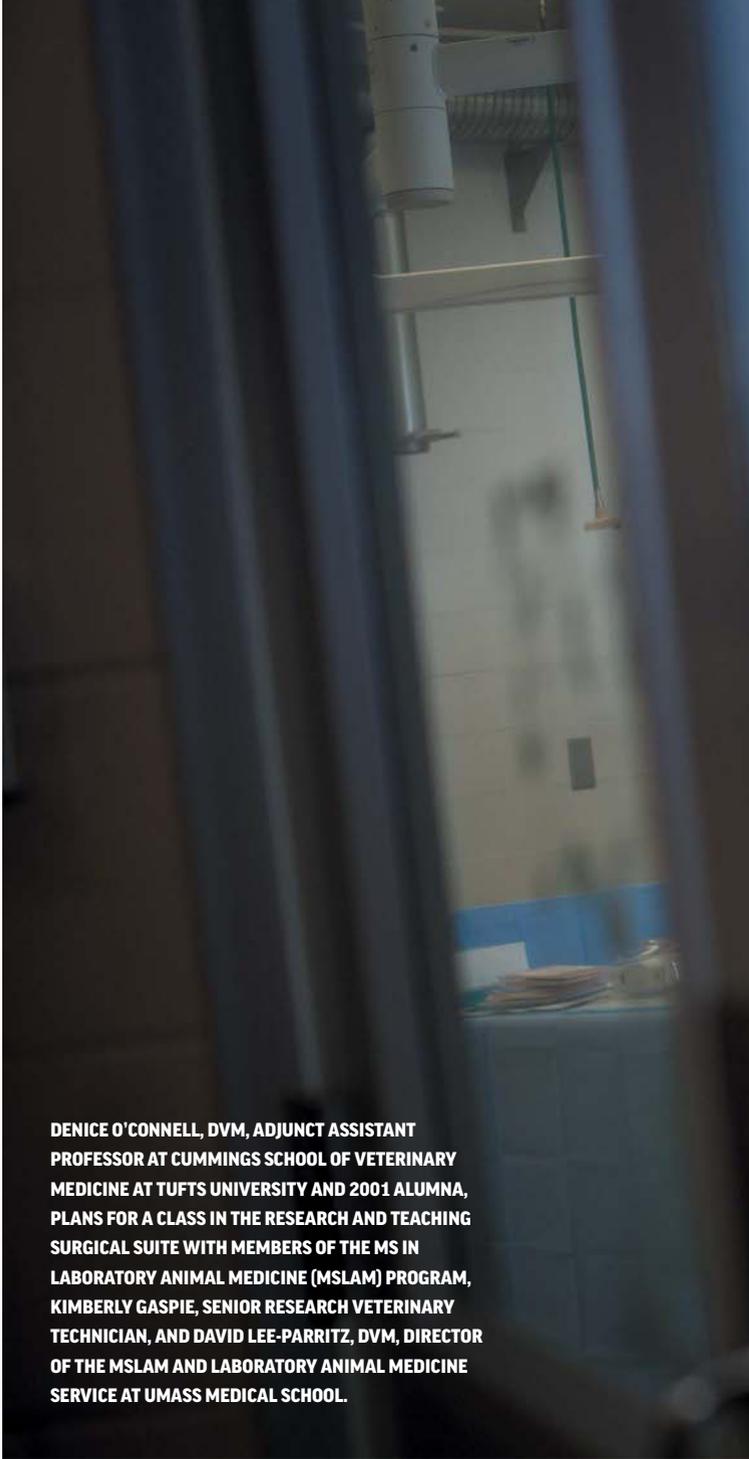
For O’Connell, director of global animal welfare and attending veterinarian at AbbVie, a global pharmaceutical firm in Worcester, navigating these two objectives has not been the downside of her professional life; it’s been the point of it.

She identified her love for both animals and laboratory science at an early age, though how to merge them effectively remained less clear. Like many young animal lovers, she set her heart on becoming a veterinarian; however, she also feared that becoming a practicing vet wouldn’t allow her to roll up her sleeves and get involved in leading-edge scientific research.

“Once you start practicing, things can become fairly routine,” she says. You do vaccinations, spays and neuters — and encounter many conditions that are very important to treat. But, in private practice, you often don’t have the time or resources to dedicate to researching every obscure disease ... I wanted to know it all.”

O’Connell discovered the path less taken during a job-shadowing assignment in her senior year of high school. “I spent one week in private practice, one week at the Oregon Zoo, and a week with a veterinarian who did research for Oregon Health and Science University (OHSU),” she recalls. The vet at OHSU wasted no time in giving her a reality check on what the life of a researcher entailed, but O’Connell was not to be dissuaded.

“She had papers stacked everywhere, and she said to me, ‘These piles represent all the regulations and laws I need to know and enforce every day.’ She gestured to another stack of papers. ‘And these piles hold all the work I’m doing to enrich the lives of the animals I’m working with and provide them with play and social housing.’ That was all very appealing to me,” recalls O’Connell.



DENICE O'CONNELL, DVM, ADJUNCT ASSISTANT PROFESSOR AT CUMMINGS SCHOOL OF VETERINARY MEDICINE AT TUFTS UNIVERSITY AND 2001 ALUMNA, PLANS FOR A CLASS IN THE RESEARCH AND TEACHING SURGICAL SUITE WITH MEMBERS OF THE MS IN LABORATORY ANIMAL MEDICINE (MSLAM) PROGRAM, KIMBERLY GASPIE, SENIOR RESEARCH VETERINARY TECHNICIAN, AND DAVID LEE-PARRITZ, DVM, DIRECTOR OF THE MSLAM AND LABORATORY ANIMAL MEDICINE SERVICE AT UMASS MEDICAL SCHOOL.



PUTTING THEORY INTO PRACTICE

O'Connell's search for an undergrad program that married her mutual interest in animals and research brought her to WPI, an experience she credits as guiding her toward biomedical research.

"As an engineering school, WPI has so many people with really wonderful scientific minds," she says. "And I had an intellectual need for science in my life." She took advantage of WPI's early acceptance program with Tufts University's School of Veterinary Medicine, creating a seamless transition from her undergraduate work to her postgraduate work in veterinary school.

After earning her doctorate, O'Connell began her professional career at the University of Massachusetts Medical School, where she served first as a clinical veterinarian, and later as director of the Department of Animal Medicine, collaborating closely with the University's researchers. It was here she first met Jean King, a neuroscientist whose extensive work with neuroimaging often required use of animal models.

Now the Peterson Family Dean of Arts and Sciences at WPI, King soon saw that O'Connell was a truly rarified veterinarian. "She understood that the animal research wasn't something we wanted to do—it was what we needed to do," King says. "She cares deeply for

these animals, but she is also about the research and what diseases we're trying to solve." She noted that O'Connell is particularly skilled at "understanding both objectives, which is generally not the case."

O'Connell may be a dedicated partner of the researchers she assists, but she is an animal advocate, first and foremost. "It's easy to be blinded by the desire to cure a disease," she says. "For the scientists, their first thought may not be, 'Am I asking the right question with this animal today?' That's where I come in. And I know we're all there for the same end cause."

However, she concedes that she occasionally finds herself playing the heavy during research. "There are times when I've had to say, 'We're stopping now, because this isn't going the way it needs to go. Let's talk about it, regroup, and figure out another way.'" She maintains that these moments are as much about good science as about ethical animal care. "Working with an animal that's hurt or in distress doesn't create a good model, anyway. It behooves all of us to keep our animals happy and well cared for."

A FRIEND, INDEED

Years into her career, the ethical issues surrounding her work became deeply personal. "I met one of my best friends in veterinary school and we were two peas in a pod," she says. "But my decision to go into laboratory medicine was an issue for her. She felt that my career path was unfair to the animals we were supposed to protect. We stayed best friends (we were in each other's wedding) ... but we didn't talk about it."

The tension between them went largely unspoken, until her college friend telephoned her at work, desperate to break the silence. Her friend's firstborn son was suffering from complications caused by a prenatal stroke, and answers were coming up short. O'Connell explains, "I have to ask you a question," she began. "Do you know anyone who's doing research on pediatric strokes? Because I will do anything."

O'Connell got right to work reaching out to the medical experts in her circle, but the moment also marked a galvanizing moment for her personally. "At some point in our lives, all of us are at someone's bedside, thinking, 'I would do anything to help you,' but we don't know who to turn to. I've had the privilege of working with scientists who live and breathe what they do, just to find that cure," she says. "That was when I knew I'd made the right decision with my career."

Unfortunately, that would not be the last time O'Connell's professional path was in service to a personal challenge. In a painful twist of irony, she found herself reaching out to the same network of specialists several years later ... but this time, the patient was her



own daughter, who also had suffered a prenatal stroke that caused limited paralysis. Once again, her colleagues and their work—work she'd helped support—became invaluable. "Because of my career, I knew where to go and what to ask. I feel so lucky to be part of this world of science." [Both O'Connell's daughter and her friend's son are well on their way to independence and recovery.]

These experiences, though far too close to home, helped O'Connell appreciate why the ethical dilemmas her career posed were worth navigating. "We buy medicine off the shelf, we take it, and we feel better. But most people never get to see the biomedical research behind it," she says. "We wouldn't have diagnostic tests, treatments, medicines, and surgeries without having done this research first."

BETTING THE PHARM

In 2017 O'Connell left the world of academic research at UMass Medical Center for a new position with AbbVie. She is not the first to acknowledge the negative public perception of animal research within "big pharma," but her experience could not be further removed from those stereotypes. "When it comes to the interests of the animals, this is one of the most forward-thinking companies I've ever seen," she says.

As evidence, she points to her newest position as director of global animal welfare. In this role, O'Connell oversees the treatment of animals at all the company's domestic and international sites, a responsibility that goes far beyond basic compliance. "I provide assurance that all our sites go far beyond just meeting federal and state requirements," she says. "If animals need to be socially housed, they'll be socially housed. If they like to nest and play, they'll have the opportunity to do that."

In fact, the decision to involve animal models in research is generally one of the last steps in bringing a drug to market, and one that O'Connell is instrumental in making. "Before animals become involved," she says, "a lot of people will come to me and say, 'I have this idea. Does it make sense to do this with a mouse? Should it not be a mouse?' We have those conversations first. The last thing anyone wants to do is go down the wrong path in research."

She also notes the countless research methods that typically precede animal involvement, from basic bench work to testing with newer technologies, such as "organs on a chip" [microchips that simulate lungs, kidneys, and even brain function].

"With organs on a chip, she explains, "you have microscopic cells that mimic an organ, and you can essentially see in a petri dish how a specific organ is going to respond to different drugs."

Part of O'Connell's job as an animal advocate is to recommend viable alternatives to living models whenever possible. "Historically, rabbits were used to look at endotoxin levels in compounds, but now we have other ways to do that in vitro," she says. "Due to their specificity, some alternatives work as well as, if not better than, the live rabbit model."

CALL OF THE WILD

Last fall O'Connell made her way back to the WPI campus as a guest of Jean King. Her longtime friend and collaborator had organized a conference called Next-in-Bio, an event designed to give undergraduates exposure to emerging career paths in the life sciences. King knew that O'Connell could be a powerful voice to the next generation of researchers. "Denice took the grounding she gained at WPI," she says, "and decided that she wanted to be not just a vet, but a vet who helps other people solve major problems—which is very WPI, in terms of theory and practice."

O'Connell's message to the students in attendance was not so much a clarification of what her job entails, as much as a declaration that her job exists at all. "A lot of students haven't considered a career in this field because they didn't know it was an option," she says. "In fact, I think that's true for a lot of veterinarians."

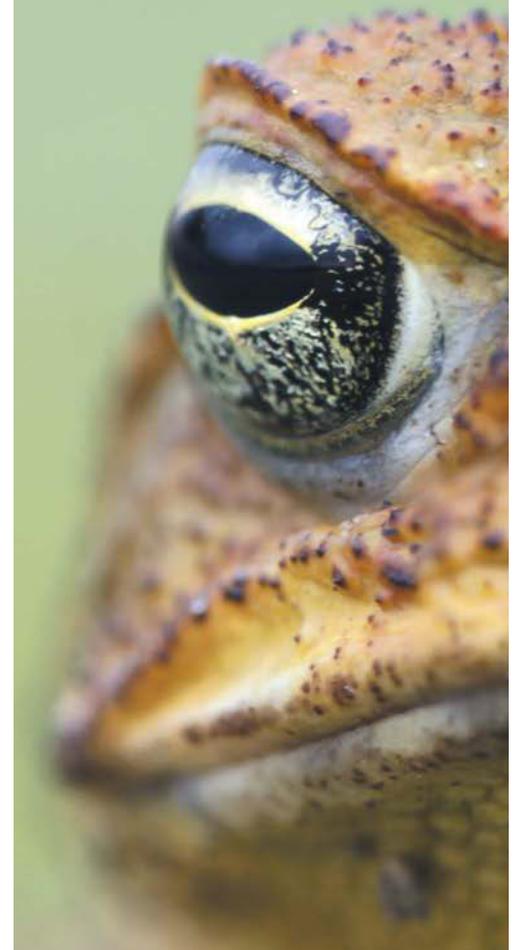
Her argument to those who would take up her mantle is not that they too can chart a path to ethical animal welfare, but that there is no other way. "I spend every day figuring out how to make our animals happier and enriched, because someday those animals might save my friend's son's life, or my own child's life," she says. "Somebody has to be an advocate for those animals. And I am more than happy to be that person."

As American novelist F. Scott Fitzgerald famously said, "The test of a first-rate intelligence is the ability to hold two opposed ideas in mind at the same time and still retain the ability to function." By that metric alone, Denice O'Connell possesses nothing less than a first-rate intellect. [\[J\]](#)

BURROW LIKE A BUFO

How do you make a Bufo toad feel at home? With an entire colony of the toxin-shooting amphibians living in her laboratory, Denice O'Connell was determined to find out. Housed in paper-lined aquariums, the toads were unable to indulge their burrowing instincts, potentially increasing their stress levels during their multi-year stay. But what bedding material would be authentic to the toad's habitat and hygiene? O'Connell developed a preference study, employing more than a dozen potential substrates and monitoring the toad's choice with video footage.

What did get the Bufos in a burrowing mood? (Drum roll, please) ... condensed coconut fiber with a splash of water, available at a pet store near you.



MARCO KALTOFEN '09 (MS ENV), '15 (PHD CE)

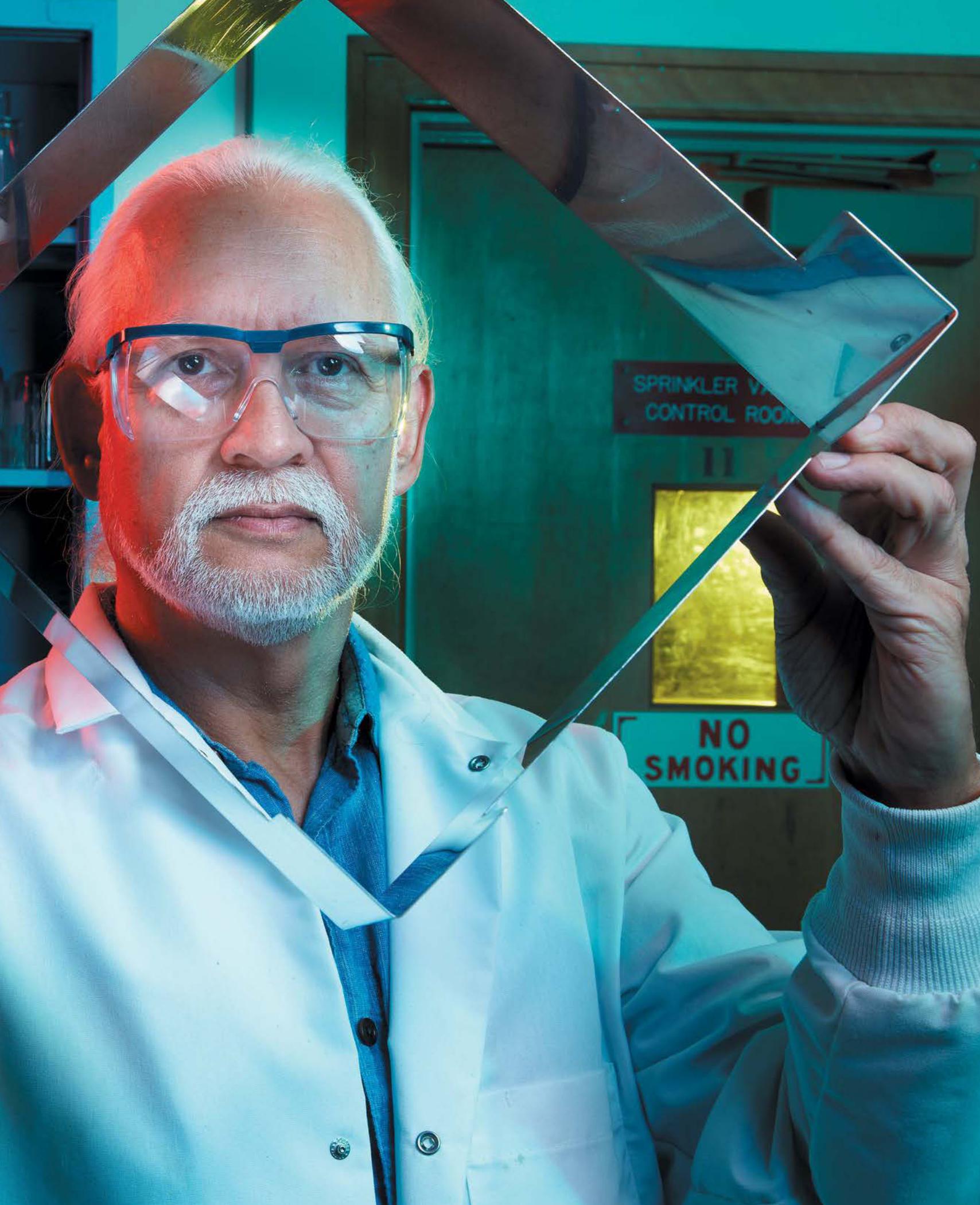
BY JOHN MARTIN | PHOTOGRAPHY MATT FURMAN

NUCLEAR SLEUTH GENERATES EXOTIC DATA FROM MUNDANE OBJECTS

They say it's the little things that matter most, and **Marco Kaltofen** couldn't agree more. The civil engineer "fingerprints" nuclear, chemical, and petroleum contamination via field sampling and investigations in the United States and internationally. He gets called to all the hot spots, like the Fukushima nuclear meltdown in Japan and the Deepwater Horizon oil spill in the Gulf of Mexico. He's analyzed air, water, and sediment samples for Kuwait after the Gulf War, and probed formaldehyde issues in FEMA emergency housing after Hurricane Katrina.



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you have finished here.



SPRINKLER VALVE
CONTROL ROOM

NO
SMOKING

KALTOFEN'S MO IS THINK SMALL TO FIND BIG. “Generating exotic data from mundane objects—this is the key to forensic analysis,” he says. “Pretty much every industrial process creates a vast cloud of dust. If you are trying to make a nuclear weapon, you create a sizable cloud of microscopic dust particles, not just once but at every key step of the process. These can be tracked down, captured, and isolated—and used to tell the tale of exactly what is going on in a ‘secret’ facility.”

In tracking nuclear footprints, he collects shoes, clothes, attic dust, and similar everyday items. From these, he isolates the microscopic dusts that contain rarely encountered materials like uranium, thorium, scandium, and other elements. He’s compiled an extensive catalog of rare particles that correspond to each facility or nuclear test site. “If I get a shoe or a used towel from a new unknown or secret site, I compare the particles to my catalog. Then I can tell you what kind of weapon or other nuclear device is being made there.”

He credits standout professors during his undergraduate years at Boston University for first exciting him about the environmental field. “The work is varied and challenging,” he says. “It’s impossible for me to imagine not doing it.” It’s a humanistic mission, as much as it’s hard science. “The people I meet who are confronting an environmental crisis—Fukushima, Hurricane Katrina, the BP oil spill, and a hundred other places—are desperate for information about what’s happening to them, their communities, and their regions. The work is incredibly impactful.”

It’s also in his blood—going way back. When he traced the ancestry of his father’s Indonesian family, he discovered that he was the fifth generation in an unbroken line of civil engineers dating back to 1847. His father left Indonesia during the upheaval following the Indonesian Nationalist Revolution, and settled in the Netherlands as a refugee. Kaltofen was born there, and when he was two his entire clan, Dutch and Indonesian, came to the United States.

The peripatetic gene—Indonesia, the Netherlands, life in America (Kaltofen is a U.S. citizen, and has a Dutch passport and EU work permit)—seems to be in his blood as well.

“One thing that stands out in all my decades of doing civil engineering is traveling for fieldwork to 49 of 50 states—I’ve missed Hawaii—and many countries to collect samples,” he says. “I’ve flown so much that Delta Airlines, unbidden, sent me leather luggage for Christmas one year.”

/// TIPPED OFF

The tips that trigger his sleuthing come from the people on the ground. He says this is how almost every environmental investigation begins—someone close to the problem calls him. “The calls have kept coming throughout my entire career,” he says, “even when my business number was unlisted. The ones who found me really wanted my help.”

Kaltofen is the founder, president, and principal investigator of Boston Chemical Data Corp. in Natick, Mass. He says the firm tries to answer one or more of three simple questions for clients: If you’ve found something toxic or radioactive that shouldn’t be there, where did it come from? If you’ve lost something toxic or radioactive, where did it go? Can it hurt somebody?

The company specializes in “environmental fate”—basically, where does stuff end up? “If I left a pile of chemical x in a parking lot in

Kansas, where would it be in 25 years? Would it wash out into a river, evaporate into the air, filter into the ground, or be eaten by weasels? This is stuff environmental engineers need to know, or at least learn how to figure out.”

The work involves nuclear forensic examinations, petroleum spill fingerprinting, and advanced forensic microscopy. Kaltofen uses chemical, geographical, and engineering information systems to 3D-image models for groundwater, air transport scenarios, fire plumes, etc. He also performs micro- and nanoscale analyses to track isotopes and isolate and detect “hot” particles.

Working through WPI, he was the engineer responsible for both set-up and analysis of materials collected from air and dust sampling systems on the Fukushima Dai-ichi Global Air Monitoring Project and for analyzing cesium-137 in components from the Chernobyl Unit 4 reactor in Ukraine. At Boston Chemical Data, he worked on behalf of the nuclear workers union, the United Association of Plumbers and Steamfitters, to do the sampling planning and study design for radiological and mixed waste contaminants at the Hanford Nuclear Reservation on the Columbia River in the State of Washington; additional work on plutonium found in dust in the homes of Hanford nuclear workers was done through WPI.

He thinks, at best, we’re doing a “fair” job of measuring radiation today. His research focuses on how to do a better job of accounting for the complexity of radiation behavior in the real world. “When the measurement task is done more completely, radiation becomes a more predictable—if still dangerous—force,” he says. “Failing to properly measure radiation in the environment is akin to letting everyone drive without speedometers. You’re asking for trouble.”

He likes to head off that trouble at the pass—in many of these situations, he is working with people who may be stuck in a dangerous situation but have few options for relief. “You have to be willing to get yourself on the ground as quickly as possible after an event. When my oldest daughter saw a CNN broadcast video of the aftermath of Hurricane Katrina in New Orleans, she said, ‘When are you leaving, Papa?’ I was there three days later.”

STAND UP FOR SCIENCE ///

Bringing his science-based forensics to an investigation has made Kaltofen a strong advocate for science in general. Along with ongoing environmental crises, that’s one of his greatest fears for the modern world—the relentless challenge to the legitimacy of the scientific method.

“The anti-science movement is a very scary development, and should not be underestimated,” he says. “By attacking very specific, little-known but truly fundamental scientific underpinnings of how we regulate and protect the environment, the entire edifice of environmental protection is under threat. This is not the work of ignorance, but a carefully targeted effort to dismantle environmental protections. We, as scientists, need to ask ourselves how we plan to maintain our relevance in the face of this kind of focused opposition.”

That’s not meant to discourage anyone from becoming a scientist or engineer—just the opposite, says Kaltofen, who has been a judge in the U.S. Army STEM student competitions. “People in STEAM careers—I like the Science-Tech-Engineering-Arts-Math version of

“PRETTY MUCH EVERY INDUSTRIAL PROCESS CREATES A VAST CLOUD OF DUST. IF YOU ARE TRYING TO MAKE A NUCLEAR WEAPON, YOU CREATE A SIZABLE CLOUD OF MICROSCOPIC DUST PARTICLES, NOT JUST ONCE BUT AT EVERY KEY STEP OF THE PROCESS. THESE CAN BE TRACKED DOWN, CAPTURED, AND ISOLATED—AND USED TO TELL THE TALE OF EXACTLY WHAT IS GOING ON IN A ‘SECRET’ FACILITY.”



the STEM acronym—have a lot to offer a climate-changed world. The fact that we will have to earn respect for science once again does not diminish the need for scientists.”

That’s why he returned to college in midlife to get his MS in Environmental Engineering (’10) and PhD in Civil Engineering, and a Nuclear Science & Engineering graduate certificate (’14). “I went back to school because I wanted to be a better scientist and I had specific research ideas I wanted to pursue.” But he also wanted to keep his career as the principal at a small engineering consulting firm. “WPI’s mix of online, evening, and project-based study made it possible to do both—earn a PhD while having a consuming day job and raising two daughters.”

WPI attracted him because he’s a strong proponent of project-based learning. “Working as part of a team on specific projects is how science and engineering are usually done, and learning should work in the same way. The divide at WPI between study and engineering practice is small; WPI’s motto—Lehr und Kunst, theory and practice—is a real thing. Lots of universities have strong and accomplished faculty. What helped me most as a student at WPI was the attitude that everyone was here to get something done.”

He’s still involved with the school as an associate research engineer in the Physics Department, and recently worked with the Nuclear Science & Engineering program on a proposal for the

MacArthur Foundation 100&Change competition. The WPI entry for the \$100 million grant, to be awarded in Fall 2020, focuses on how to measure radiation better and make the results more transparent—of particular value to underrepresented communities, often the most severely impacted by radiation. “The idea of our project is to make nuclear data completely open, public, and democratized,” he says.

For all his globetrotting, Kaltofen still finds time to chill, and keep fresh. He’s a big fan of the Dutch women’s national soccer team, and found himself happily cheering for both sides in the recent US/Netherlands World Cup soccer final. He runs daily, lifts weights three times a week with his youngest daughter, and rides a heavy-duty black mountain bike to work every day.

Staying fit, and intellectually engaged, keeps his motor running—he once drove a Zodiac inflatable boat for Greenpeace. “I got my PhD at WPI when I was 55 years old,” he says.

But what really seems to keep him young at heart is service to others. He prefers to work in the background, on the little things that reveal the big truths, and then turn over what he has learned to those most affected by the environmental crisis.

“These people are their own best voice and advocate,” he says. “I can give them the data, and the data can tell an important story. But it is these people, indigenous to their own localities, who tell the story best.” [J]

QUINT POINT

FOR BARRY SIFF '76, following in the footsteps of his brother Fred '64, seemed a clear, comfortable choice. Once on campus, however, he admits he was more than a little unsure where his path would lead.

"To be brutally honest," he says, "I only went into Civil Engineering knowing that many athletes were in Civil. I had absolutely no plans in life ... just get through WPI with a degree and good things would happen" – which, according to Siff, is precisely what transpired.

Following graduation, Siff secured a position in Detroit as an insurance company safety engineer. This, combined with labor relations work, led him to pursue a master's in industrial relations. He soon rose to director, then to VP, and ultimately to senior VP of a \$7 billion division within a Fortune 25 company.

"There I discovered that I was really good at making things happen between people," he says. Then, in 1998, the entire executive team was relieved of responsibilities with the arrival of a new CEO from the parent company. Suddenly, at 42, Siff found himself at a fortuitous turning point – one where he saw new possibilities for his career ... and his life.

"My exit from the corporate world allowed me a cushion to live up to one of my favorite mottos: pursue your passion and enjoy life," he recalls. Taking his appetite for endurance sports to heart, he entered adventure expedition races all over the world, competing in 20 countries in five years. Simultaneously, he channeled this growing enthusiasm into a triathlon and running race company called 5430 Sports, which he and his wife, Jodee, founded in 2004 in Boulder, Colo. The company grew to produce eight triathlons and running events with over 7,000 participants. After five successful years, they sold the business to World Triathlon Corporation, owner of IRONMAN, which produces a series of long-distance triathlon races and other events around the world.

Not finished with his love of the triathlon, Siff became involved with USA Triathlon, eventually moving into the role of president for five years until his transition to CEO of USA Team Handball in spring 2019.

Having first seen Team Handball in the 1996 Atlanta Olympics, the sport mystified him – it was hugely popular in Europe, yet was relatively unknown in the US. Seeing it again in the 2016 Rio Olympics, Siff decided to delve deeper into the game and its dynamics.

"I told the US Olympic and Paralympic Committee that I was ready to take this awesome sport to the promised land, and they agreed," says Siff. "As an endurance athlete and business person, I relish challenges, and this may be the biggest of my life." He plans on elevating the awareness, participation, and fan base of the sport in the US – and ensure the US team a firm place upon the world stage.

It takes a lot of confidence to take on such a role, and looking back at his undergrad years, Siff says he can easily recognize how WPI helped him develop into a well-balanced athlete and businessperson. Learning to set goals, collaborate with others, and work at something of importance or value was the gift bestowed upon a young man during his undergraduate years.

One thing this auspicious, athletic 60-something admits is that all successful people have a solid team at their side. "Whether it's running a 100-mile trail race, putting on a major triathlon event, or helping run a national governing body of a sport, you need people with and behind you. No one has been more integral to my success in the second phase of my life, my post-business career, than my amazing wife, Jodee."

As his efficacious turning point proves, Siff has surely been on a winning team.

DOREEN MANNING



DURING HIS TENURE AS PRESIDENT OF USA TRIATHLON, SIFF FORMULATED AN INITIATIVE TO MAKE WOMEN'S TRIATHLON AN OFFICIAL NCAA SPORT AND DESIGNATED CLOSE TO \$3M TO MAKE IT HAPPEN. ARIZONA STATE UNIVERSITY WAS THE FIRST "POWER 5" SCHOOL TO JUMP ON BOARD, AND HAS BEEN A LEADER—AND NATIONAL CHAMPION—FROM THE BEGINNING.

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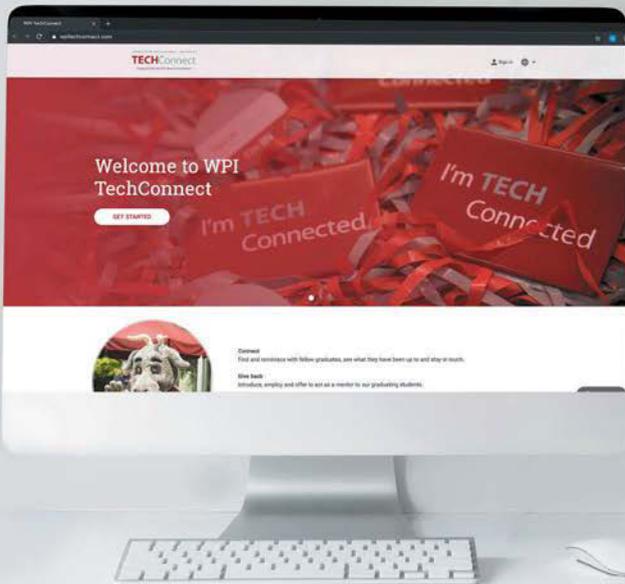
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From the Desk of



MARK MACAULAY '89, '94 MS
ALUMNI ASSOCIATION PRESIDENT

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- Sign up for TechConnect and start connecting with all things WPI—wpi.edu/+techconnect

Congrats

To the newest members of the WPI Hall of Luminaries, inducted Oct. 24—see page 44, wpi.edu/+luminaries

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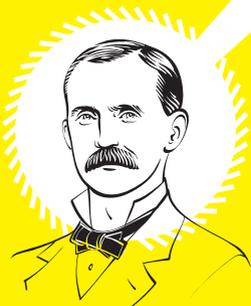
- Alumni Weekend 2020, May 28–31—wpi.edu/+alumniweekend
- Goat Nation Giving Challenge—watch for details March 2020
- More opportunities to attend events and get involved—wpi.edu/+techconnect

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—BIOGRAPHICAL NOTICE OF CHARLES OLIVER THOMPSON, PREPARED BY P. EMORY ALDRICH FOR THE REPORT OF THE COUNCIL OF THE AMERICAN ANTIQUARIAN SOCIETY, 1885

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- Petitioned for \$50,000 in founding support at the state level
- Was known for establishing one of the largest and most successful law practices in Worcester County

"... the company has lost one of its best friends, Cambridge one of its best citizens, and the Commonwealth an honored, respected and loyal son ..."

—EMORY WASHBURN: END OF HIS EARTHLY CAREER," CAMBRIDGE CHRONICLE, MARCH 24, 1877



JOSEPH ADAMS 1975

DESIGNER AND BUILDER OF ICONIC PROJECTS GLOBALLY

- Retired president of Energy and Industry for MWH Global, 7,000-person engineering and construction company
- Worked in more than 30 countries around the world
- Chairman of the MWH lead design consortium for the \$5 billion expansion of the Panama Canal

"Engineers have an obligation to build a better world as every person has the right to basic human needs."

—JOSEPH ADAMS



ROBERT H. BECKETT 1957, HON. 2013

ENTREPRENEUR, VISIONARY, PHILANTHROPIST

- Inventor of an analog and digital gravimetric feeder for dry granular materials
- Instrumental in a method to certify the carbon content of gray iron
- Successfully introduced, distributed, and applied the first microcomputers to industry

"... the education WPI students receive will help them find the technologies that will stimulate their curiosity and help them build their life's career."

—ROBERT H. BECKETT



HAROLD S. BLACK 1921, HON. 1955*

INVENTOR OF THE NEGATIVE FEEDBACK AMPLIFIER

- Greatly advanced telecommunications technology with the negative feedback amplifier
- His principle of negative feedback among the most important ideas in electrical engineering during the 20th century
- Earned 63 U.S. and 278 foreign patents during a nearly 40-year career at Bell Labs

"The career of Harold Stephen Black has been characterized by distinctive achievements that have won him national renown and that have brought honor and distinction to his alma mater..."

—BLACK'S HONORARY DEGREE CITATION

The Hall of Luminaries celebrates WPI and its long history of theory and practice by honoring the individuals who have brought about extraordinary accomplishments to society; the 2019 inductees were celebrated in October. Nominated by the WPI community and selected through a balloting committee process, the members of this year's influential group not only achieved the pinnacle of their professions or made exceptional contributions to humanity or to their fields, but they also inspired our community, lighting the way for others.



GEORGE S. COWAN
1941, HON. 2002*

PIONEER IN NUCLEAR CHEMISTRY AND TRANSDISCIPLINARY RESEARCH

- Central figure in the founding of the Santa Fe Institute
- Illustrious nearly 40-year career at Los Alamos National Laboratory
- Enrico Fermi Award and Los Alamos National Laboratory Medal recipient

"I wasn't motivated to be a great scientist. I just wanted to experience every aspect of science that I could sample."

—GEORGE S. COWAN



HOWARD G. FREEMAN
1940, HON. 1996*

INVENTOR OF THE WATERFOG NOZZLE

- Waterfog and firefighting foam nozzles credited with saving dozens of ships and thousands of lives during World War II
- Foam nozzle became standard equipment used to fight aircraft fires at airports, saving many more lives
- Founder of the Jamesbury Company in Worcester

"Watching the firefighting on the carrier decks in the [World War II] documentaries continues to be of interest and even excitement to me. And a deep feeling of gratitude that I somehow was able to fill that need."

—HOWARD G. FREEMAN



SCOTT HARRIS
1982

COMPUTER-AIDED DESIGN VISIONARY AND THOUGHT LEADER

- Co-founder of SolidWorks Corporation and Onshape Inc.
- His products have become the mainstay for thousands of schools and companies worldwide
- Deeply committed to state of the art for CAD, engineering, entrepreneurship, mentoring, solving problems of consequence, and advocating for social action

"Scott has been a big part of moving the product development tools space forward as a founder of both Onshape and SolidWorks."

—JON HIRSCHTICK, CEO, ONSHAPE INC., FORMER CEO, SOLIDWORKS CORP.



MILTON P. HIGGINS*

FIRST SUPERINTENDENT OF THE WASHBURN SHOPS

- Hired experienced tradesmen to teach students the art of manufacturing
- Co-founded and led Norton Company with WPI professor George Alden
- Considered father of the trade school

"To make a good living, to have a happy family, to make preparation for hard times, ... to be confident you are laying a foundation for any future success, to feel that you are master of your work and that you share the creative spirit; this is the wholesome philosophy of learning a trade."

—MILTON P. HIGGINS



REV. DEBORA JACKSON
1989 MS, 2000 MENG

LEADER, EDUCATOR, AND AUTHOR

- Paves the way for underrepresented people of color and women
- WPI's First African American woman trustee
- Demonstrated leader and sought-after speaker, consultant, preacher, and author

"... as we unearth and retell the stories of our own cultural heritage, those stories can powerfully enhance who we are as leaders."

—DEBORA JACKSON

CONNECTED COMMUNITY

PHILANTHROPY SUPPORTS NEW ALDEN TRUST CHALLENGE

To George and Karen (Zalewski) Oliver, both Class of '82, WPI's newest state-of-the-art academic facility will prepare students for the demands of the Fourth Industrial Revolution, a term used to describe the blurring of boundaries between the physical, digital, and biological worlds (think artificial intelligence, robotics, Internet of Things, etc.). In addition, they see an opportunity to build on the university's tradition of providing a place to usher research toward results and solve important problems.

The building, supported by the generosity of alumni, parents, friends, corporations, and foundations, is WPI's newest addition toward a global view of education

CHALLENGE ACCEPTED

In making their generous seven-figure gift toward the project, the Olivers accepted a challenge by the George I. Alden Trust, which pledged \$5 million contingent on alumni and trustees donating \$20 million over the next three and a half years toward the facilities component of WPI's next major fundraising campaign, and also realizing 100 percent trustee participation in the campaign.

"We believe that's a good place to put the resources we've built back to work to make a difference with this next generation," says George, chairman and CEO of Johnson Controls and a member of the WPI Board of Trustees.

Ground was broken on October 4 for the building to be located at the base of Boynton Hill. The building will be a hub for experts in areas such as architectural engineering, autonomous vehicles, bioinformatics, computational biology, cybersecurity, data science, interactive media and game development, learning sciences and technology, neuroscience/engineering, robotics, and smart design.

Its versatile learning spaces will be configured to suit different purposes and support flexible research and hands-on, project-based learning. It will also house an integrated Student Academic Services Center.

The facility is one component of a comprehensive campus master plan, which calls for creating new and renovated

spaces to support cutting-edge research, interdisciplinary collaboration, and teaching and learning.

MOVING SOCIETY FORWARD

"The Trustees believe that WPI continues to be worthy of our strong support, especially for the important programmatic role this new facility will play in extending WPI's cutting-edge educational offerings to address future societal needs," says Warner Fletcher, Alden Trust chair. "We would hope and, frankly, expect that the alumni would feel similarly, knowing personally how their WPI education has positively impacted their lives, and that our challenge would provide added incentive for them to dig in and strongly support this project. We also are intrigued that this new building will likely become a major new pathway connecting the lower east side campus with the Hill campus."

Alden trustee Gail Randall notes that the new building will help WPI prepare students to better meet the demands of the Fourth Industrial Revolution, a focus that makes this project especially compelling. "This aspect was useful and appealing in thinking about the need for the building," she says.

As head of a multinational conglomerate that produces fire, HVAC, and security equipment, George noted that the success of companies like his depends on universities like WPI preparing students to stay ahead of swiftly moving, technology-driven change.

The Olivers' gift contains a hope for the future, but also memories of the past. Karen was a computer science major at WPI and remembers spending hours waiting for print-outs in the computer lab, which was located in the basement of the library. The new building, as does the Foisie Innovation Studio, will give students the space and the tools to succeed. The Olivers were also major contributors to that building.

"Our future is going to depend on being able to accelerate in our abilities," George says. "Success is having an infrastructure that enables interaction, teamwork, and entrepreneurship."





Expected to open in January 2022, the \$80 million, 100,000-sq.-ft. building will embody WPI's collaborative approach to research and education that impacts the world. Situated at the base of Boynton Hill, the building will include versatile and flexible learning, research, and collaboration spaces, as well as student space and faculty offices. It will also house an integrated Student Academic Services Center, physically connecting the offices of the Registrar, Academic Advising and Resource Center, Disability Services, and Career Development Center, essential services for student success.

It will also house an integrated Student Academic Services Center, bringing the offices of the Registrar, Academic Advising, Disability Services, and Career

Development Center under one roof and conveniently connecting students with the support and guidance they need to help them succeed throughout their WPI journey and beyond.

The new building will improve navigation and accessibility from Boynton Street to the top of the Hill and help create strong, direct connections between WPI's main campus, its eastern residential area, and its academic programs and centers at Gateway Park.

VISIT [WPI.EDU/+CONNECTEDCOMMUNITY](https://wpi.edu/+connectedcommunity)



A solid family connection

JAMES PETROPULOS's four years as a civil engineering major and basketball forward at WPI prepared him for the future and remain a wellspring of warm memories. So, when his youngest child was considering colleges, Petropulos '83 scattered more than a few hints about applying to his alma mater.

"I always jokingly said to her, 'WPI is quite a place,' with the deep-down hidden hope that someday she would be interested in going there," he says.

It didn't look promising. **OLIVIA PETROPULOS '22** had her heart set on nursing school, even if that meant giving up competitive swimming, a sport she loved in high school. She applied to four nursing programs, then, at the last minute, thought, 'why not?' and squeaked in an application to WPI just under deadline.

"Two months later, I'm waiting for my decision and WPI is the only thing I could think about. Every day I checked the site to see if I got in," Olivia says.

WPI holds a firm place in Petropulos family lore. Jim met his wife, Lynda, there while she was a student at Quinsigamond Community College. And it was because of WPI that he landed his job with the company he co-owns today.

WPI was one of two colleges that recruited Jim for basketball. Jim was impressed by then-Coach Kenneth Kaufman and Harrington Auditorium and was intrigued by the WPI Plan. He knew he would receive a solid engineering education at WPI.

There, Jim found the perfect blend of academics, athletics and social life among the civil engineering faculty, his fellow basketball players, and Lambda Chi Alpha fraternity brothers. When he graduated with a civil engineering degree, entry-level positions in the field were scarce, so he returned home to western Massachusetts and took odd jobs while searching for work. Jim was in the Worcester area six months later to spend Christmas with Lynda and her family when he popped into the career office at WPI looking to see if there were any civil engineering jobs posted. Then-dean Bill Trask looked up from the phone and held his finger up, signaling Jim to wait.

"Minutes later he called me into his office, handed me the phone and said, 'Hey Jim, there's a gentleman on the phone looking for a civil engineer.'" It was Paul Hayner '69, owner of Hayner/Swanson Inc., a civil engineering and land surveying firm with offices in Burlington, Mass., and Nashua, N.H. "Thirty-five years later, I'm one of the owners of the company," Jim says. In addition," he says, "here at my office we have four other WPI alumni: Paul Hayner '69, Earle Blatchford '84, Steve Auger '96, and Tom Zajac '10. It's been great working with these gentlemen."

Jim and Lynda raised their three children in New Hampshire, but returned to WPI for basketball games and other events. And no trip back home for family get-togethers was complete without a walk through campus. Jim's two older sons also pursued engineering degrees at the University of Hartford. Chris is an acoustic consultant in New York City and Alex is a professional drummer with the band Pigeons Playing Ping Pong.

As a high school senior, Olivia packed her schedule with classes and doubled up on science. It was a challenging year, but Olivia proved to herself that not only could she handle the work, she thrived on it. Nursing appealed to her in part because she wanted a career helping people, but Jim knew she could have a similar impact as a biomedical engineer.

"He's always said that for my whole life he's known two things: I'm a swimmer and I have the mindset of an engineer," Olivia says.

Both she and her father were ecstatic when Olivia received her acceptance along with a spot on the swim team.

"I was so proud when she got accepted. Looking back, I am so thankful for my WPI experience. It gave me a career, I met my wife there, and I developed lifelong friendships with fraternity brothers and classmates. For her to be able to share a similar college experience is something special that she and I will have together," Jim says.

Olivia, now in her second year as a biomedical engineering major, says her family's sense of awe hasn't worn off. "Every time I go home, I'm met with the question of, 'Can you believe you're at WPI?'" she laughs. "It's just so amazing that I'm here."

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

To join, visit plannedgiving.wpi.edu.

“MY DEGREE FROM WPI
AND THE EXPERIENCES
I ENJOYED OVER THE FOUR
YEARS OPENED DOORS TO
MANY OPPORTUNITIES FOR
ME WHICH WERE NEVER
ON MY RADAR.

Having paid my own way through college by working
and receiving scholarships and loans, I understand the
need for tuition support and began thinking about
ways to give back. Anita and I decided that it was the
right time for us to endow a scholarship through a
Charitable Remainder Unitrust. We receive income for
life, we can make future contributions to the trust, and
we've established our legacy of giving at WPI. “

— BRUCE OCHIEANO '64

Through their Charitable Remainder Trust, the Ochieanos
have established the Anita E. and Bruce A. Ochieano '64
Endowed Global Scholarship.

FOR MORE INFORMATION

Contact Lynne Feraco, Executive Director of Gift Planning
888-974-4438 | lferaco@wpi.edu

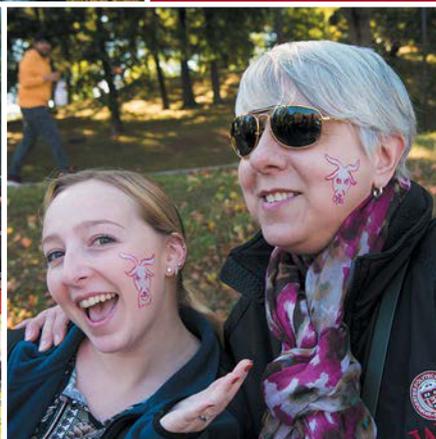


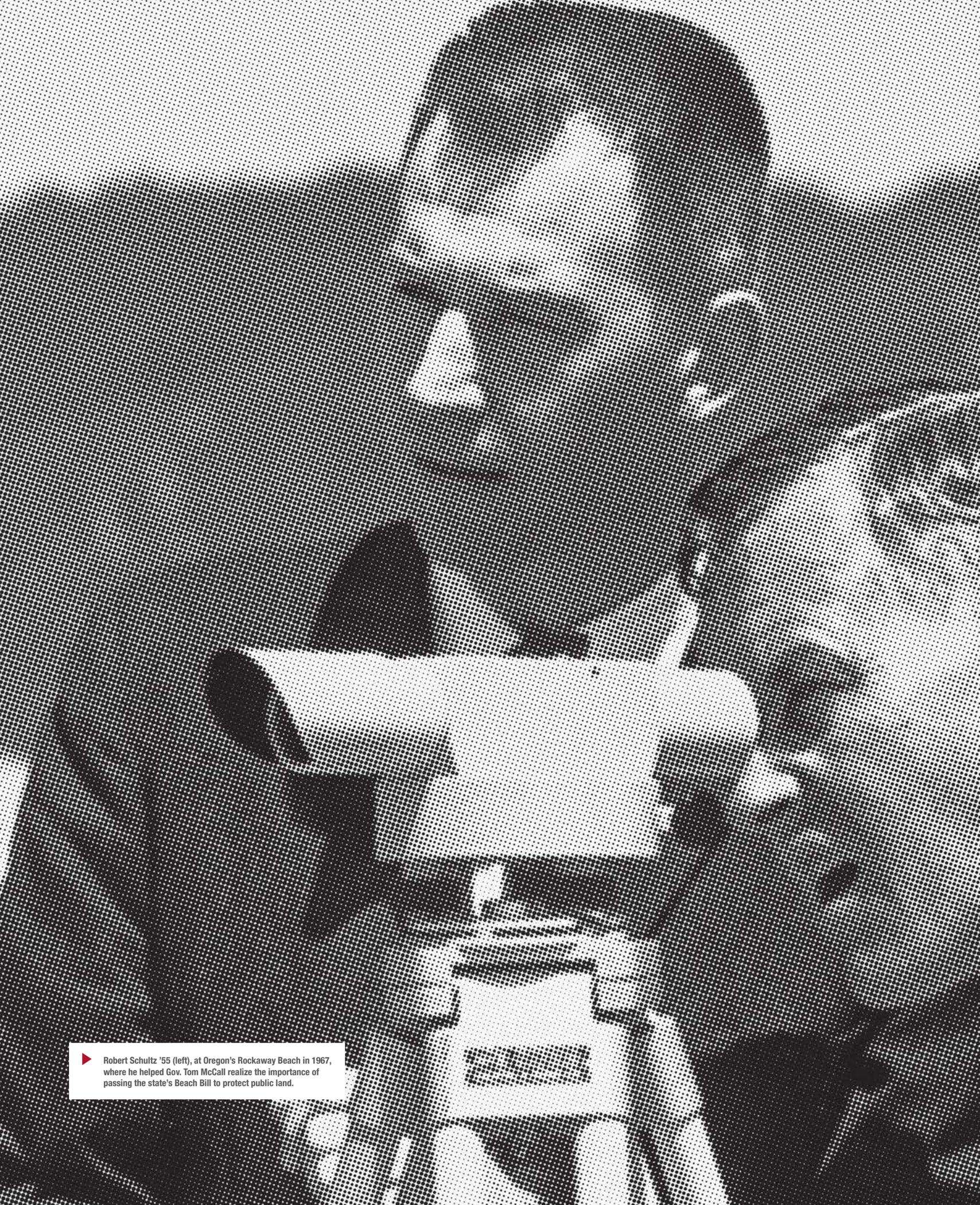
2019

HOMECOMING



October 4 and 5 were days of pride and nostalgia on the Hill. Ground was broken for a bold new building to accelerate WPI's impact. We celebrated our accomplished alumni athletes at the Athletic Hall of Fame, cheered the Engineers on the fields and courts, gathered with friends, made some new memories, and remembered it's always goat to come home.





▶ Robert Schultz '55 (left), at Oregon's Rockaway Beach in 1967, where he helped Gov. Tom McCall realize the importance of passing the state's Beach Bill to protect public land.

CLASSNOTES

submit your class notes to
CLASSNOTES@WPI.EDU

 CLASS REUNION YEAR

1944

"I decided to send a Class Note before it was too late," writes **Dwight Harris**. "My WPI training gave me a satisfying career in new product development, entailing invention and management. I have many memories: Watching Professor Masius spinning on a turntable, forging steel links, making a transit survey, and working in the foundry, pattern shop, and machine shop. And doing calculations with the LogLogDecitrig, or log tables. I am now in relaxed mode in a senior residence, with funding indirectly provided by WPI. I give thanks for that."

1946

Herbert Slaughter writes, "I always enjoy seeing what is on the Class Notes page for 1946. I was pleased to read in the *Spring Journal* that our classmate **Bob Appenzeller** is doing well in his hometown of Dayton, Ohio." Herb recalls Bob's arrival at WPI in February 1943 to take part in the Navy's V-12 program. "The V-12 unit was composed of eligible WPI students who signed up, supplemented by engineering students transferred by the Navy from other engineering schools. It also contained six or seven civilian students eligible to take classes with the Navy V-12 students."

"Bob was transferred by the Navy to WPI from the General Motors Institute

Engineering School. Some of the transfer students were fraternity members in their previous schools, but found none of their fraternities at WPI. To handle the situation, the Interfraternity Council ruled that House Guest [status] be granted. Bob and Ed Stengel signed up at Phi Sigma Kappa. They were also allowed to play with WPI fraternities in their athletic competitions. Good party times were had at the Phi Sigma house at 11 Dean Street."

Herb adds, "I am still here, but with a touch of ALS and a bad balance problem. I get along fairly well with my cane, but no longer drive. My wife, Norma Jean, turned 93 in July. She still drives and still with a sharp brain is able to get us around to the excellent musical activities at the Town Center in the city of Virginia Beach."

1950

Robert Van Amburgh writes, "My two daughters have relocated to Summerville, S.C., so we share frequent evening meals. They have filled the void of losing my wife, Peg, in 2010. I keep busy with managing my finances, taxes, personal records, etc., on two computers and an iPad. There is a challenge keeping up with Windows, and two versions of Mac. I've been using computers since the TRS-80, appreciating what they can do to help, but not caring about how they do it.

"Semi-gourmet (more than hot dogs and grilled cheese) cooking absorbs some of my time. I have over 1,200 recipes in my database. I have made considerable inroads into computerizing my Dad's genealogical collection (four file drawers, crammed full) over the years. Serious software changes have been a significant problem in that area."

1955

Robert Schultz ('60 MS CE) ◀ retired as professor emeritus in December 2018 after teaching at Oregon State University for 56 years. "This is the school record for faculty longevity," he notes. A major highlight in his career was his work toward the passage of the 1967 Oregon Beach Bill that preserved the Oregon coastal beaches for the use of the general public. Bob participated in many national technical committees and in the 1980s served an eight-year term of office on the Oregon State Board of Examiners for Engineering and Land Surveying, where he was the president of the board for the last two years of service.

1957

Boakfar Ketunuti writes, "Hi, Woopy [sic] Tech and Fijis out there, from WPI Bangkok Center. If you look at your WPI IN THE WORLD map, you

can locate us by the little red dot. Chris and I are ready for the changing wet season here."

1958

Stan Graveline reports that numerous grads from the classes of 1957–1959 gathered for their annual Cape Cod Clambake. "The numbers are dwindling but still substantial," he writes.

1959

Peter Bertsch sends this reflection. "**Ken Scott Sr. [Class of '48]** was a wonderful teacher—he made the subject of heat transfer come alive. Much of my professional work was concerned with the design of heat exchangers and regenerators, and Ken was that spark that got me started."

1960

Richard Brewster writes, "Retired 24 years, but active with Mercy Ships since '99. Most recently working in China with the title of Volunteer Project Engineer on the newest Mercy Ship, the 37,000-ton *Global Mercy*. The ship, complete with 150 beds and seven operating theaters, will provide free medical treatment in West African countries by late 2020."

1961

With the 50th anniversary of the First Moonwalk, **Charles Lehtinen** was in the news for his critical role in the mission launch. A Boeing engineer, he worked on earlier Apollo missions designing engine cutoff systems. He was the one who pushed the button for liftoff of Apollo 11. As he quipped to a *Gardner (Mass.) News* reporter, it was “One small push of the button, which catapulted the United States into the giant leap into the Space Age.” He retired from Boeing in the 1990s and lives in Kirkland, Wash. He and his wife, Carole, have three children.

1962

Bill Krein reports that his granddaughter, Annika Krein, participated in WPI’s STEM-based Frontiers program this past summer. “Annika traveled to WPI from Loomis, Calif.,” he writes. “I continue to enjoy the challenge of being an adjunct faculty member in WPI’s Foisie Business School.”

1963

Bob Magnant writes, “My 2006 fact-based novel, *The Last Transition*, is now available on Apple Books. It represents my continued attempts at confronting the hypocrisy that Iran has dealt with for years, most recently seen in a recent *New York Times* feature report by Bergman and Mazzetti. I would never want it to be said that the world did not know about Iran and its people.”

1965

Class president **Pat Moran** has launched *Class of '65 News*, an email newsletter for the class. So far, 25 classmates have sent in biographies in anticipation of our 55th Reunion, May 28–31, 2010. Send yours to

WPIClassof65@gmail.com. You can use that email address to contribute a biography, to request back issue of newsletter, and to be added to Pat’s mailing list. To publish a bio to the wider WPI community, email it to ClassNotes@wpi.edu. Pat and Reunion co-chair **Jack Kelley** hope to hear from you.

1973

In August, **Dean Kamen** debuted his Roxo SameDay Bot in front of City Hall in Manchester, N.H., hometown of his company, DEKA Research & Development Corp. Roxo (which means purple in Portuguese) was developed to accomplish “last mile” delivery for FedEx (brand colors purple and orange). FedEx became the official delivery service for FIRST, the robotics competition founded by Kamen, at Kamen’s request. In turn he agreed to develop a pedestrian-friendly delivery device for the shipping company. Roxo is based on the technology of Kamen’s iBOT mobility device for wheelchair users. Quoted on the Manchester InkLink website, Kamen reassured those who fear that robots will take jobs from people, saying, “Look,” he said, “pizza delivery guys or anyone who asks, ‘Aren’t you worried about advanced technology ruining the world?’ I say show me an example in history where new technology didn’t create more and better jobs. Just show me one.”

Rajeshwar Mathur writes, “Motivated by reading others’ notes and my own desire, I am jotting down a few words. My education at WPI helped me in rising to the level of director and professor of physics. I have enjoyed working in several teaching and R&D institutions. Also, I contributed to the launching of degree programs at Indira Gandhi National Open University, which is now one of the largest in the world. I am retired for some years now and spend quality time with my

grandchildren. Additionally, in order to exercise my brain muscles, I sometimes go the nearby college for free tutoring.”

1975

Joe Adams, a current WPI trustee, was inducted into the WPI Hall of Luminaries, which celebrates “members of the WPI community who have achieved the pinnacle of their professions or have made exceptional contributions to humanity or to their field.” He and the other nine 2019 inductees were honored at a ceremony on Oct. 24. Joe was recognized for his career with MWH Global, and for his humanitarian work with Engineers Without Borders. (See p. 44.)

David Westerling (MS CE, '95 PhD) received the Boston Society of Civil Engineers 2019 Horne/Gaynor Public Service Award. The award recognizes members for unpaid public service on philanthropic activities in the public interest. He was honored for his work in creating and chairing a Capital Planning Committee in his hometown of Berlin, Mass. David is professor emeritus, civil engineering, at Merrimack College in North Andover, Mass.

1977

Thomas Killeen writes, “I retired two years ago and have been busy in public service work, as well as some part-time fire protection engineering and technical consulting in MA, NH, and ME, as well a bit in VT on occasion. My thanks go out to Prof. Fitz in WPI’s CE department, who so encouraged me in FPE route. To profs Barnett, Lucht, and the rest – Thanks!”

1980

Bill Guilfoile writes, “I am excited to share that I have accepted a new position within the ATS organization

as director, Comecer Inc., as of Oct. 1, 2019. ATS acquired Comecer S.p.A. in February 2019. As part of the expansion, I will lead Comecer Inc. and will be responsible for sales, applications engineering, service, and spare parts activities in North America. I will remain in the Chicago area.

“Comecer specializes in advanced aseptic containment and processing systems for the nuclear medicine and pharmaceutical industries. Applications include the diagnosis and therapeutic treatment of a number of conditions, including various forms of cancer and cardiovascular disorders. Comecer also provides equipment for isolator and incubator equipment used in advanced therapy medicinal production (ATMP), a regenerative cell therapy that uses patient cells to grow new tissue.”

1981

Jim Bozeman writes, “After a long career at Lyndon State College (now Northern Vermont University–Lyndon), during which I received a PhD in mathematics from Dartmouth, all of which came after four years at the University of California, Santa Barbara (where I mainly played Ultimate Frisbee, winning a national championship), I am now professor of mathematics at the American University of Malta. My wife, Lisa, and I split our time between Malta and northern New England, and our daughter Yasmin just got her first job in Salem after graduating from Washington University in St. Louis.

“My current research interests involve measuring the shape of legislative districts in order to detect and/or prevent gerrymandering. I recently donated two books I co-edited to WPI’s library holdings: they are Volume 2 and 3 of Wiley’s *Data Analysis and Applications* series. Topics in Volume 2 include Clustering



▶ Ed Gonsalves '81 and Wally Towner '83 atop Mount Monadnock

and Regression, Modeling-estimating, Forecasting and Data Mining. Volume 3 is subtitled *Utilization of results in Europe and other topics*. These texts are dedicated to my good friend Jay Boland '81, who introduced me to Ultimate and who passed away much too young."

From the top of Mount Monadnock in New Hampshire, **Ed Gonsalves ('94 MS MG)** ▲ tweeted, "When facing challenging business problems, surround yourself with people who are smarter than you (**Professor Wally "Fabman" Towner '83**) and tackle those problems from the perspective of a higher elevation (the top of Mount Monadnock)." The two faculty members of WPI's Foisie Business School conducted an impromptu "staff meeting" at 3,200 feet.

1982

Jim Cahill is part a proud team of WPI-affiliated employees at Mutualink Inc. of Westford, Mass., which includes **Chris Leary '93**, principal software architect; and Software Quality Assurance Intern **Blake Dobay**, a computer science major in the Class of 2020.

Paula (Green) Curry, an attorney at the Boston firm Sherin and Lodgen, was named to the 2020 listing of The Best Lawyers in America. She is a partner in the firm's Real Estate Department, with a practice focusing on complex property transactions, such as multi-site sales and acquisitions, assemblages, and securitized

financings. She has been a LEED Accredited Professional since 2008.

Brian Renstrom chose to move his business, BlumShapiro, to Front Street in Worcester. He told the *Boston Globe* that the move was prompted by his belief in "the Worcester Renaissance," and his goal is to "draw talent from the region's workforce and to make a run at some 350 to 400 potential clients in Central Massachusetts."

1984

Thomas Casale was appointed vice president and general manager of Cobham Advanced Electronic Solutions' Common Network Interface and Interconnect Solutions Business Area.

1986

Michael Gonsor and **Gary Sargent** ▲ recently traveled to Whistler, B.C., for a mountain biking vacation with other friends. "The WPI logo was proudly displayed at the top of Whistler Peak for all to see!" they report.

Edmund Kochling manages composting operations for the City of Worcester. He has worked for the city for more than two decades and received the Thomas S. Green Award in 2008. A story in the Worcester *Telegram & Gazette* detailed his health problems related to mold exposure in his composting work, and his battle to receive compensation for his medical expenses. He said his goal was to prevent others who are



▶ MICHAEL GONSOR '86 AND GARY SARGENT '86 IN CANADA

sensitive to the organisms involved from suffering similar consequences.

Mike Maguire continues into his 26th year at SAP, as global VP of new market development. He is the father of two grown daughters (Kelly and Allyson) and lives with his wife, Carole, in Osterville on Cape Cod.

From **Jasmohan Singh**: "Greetings to all my friends in the classes of '86 and '87."

1989

Debora Jackson (MS MG, '00 MS MFE) was inducted into the WPI the Hall of Luminaries at an Oct. 24 ceremony. She is the first African American woman to serve on WPI's Board of Trustees, and she was lauded for paving the way for women and underrepresented people of color, as well as for her accomplishments as a consultant, preacher, and author. (See p. 45.)

1991

Mike Matton is involved in the blooming hemp and CBD

marketplace, as the founder of High Purity Natural Products. "The state of Massachusetts implemented an official hemp/CBD program in early 2018," he writes, "and after we got our state licenses we started growing industrial hemp, extracting and refining the hemp extract, and doing contract manufacturing of CBD products for clients. We operate out of a building in Southbridge and offer over 75 SKUs of CBD products, including tinctures, pain balms, cosmetic skin care, capsules, and transdermal patches.

"We have a second company, High Purity Extractions, which designs and sells extraction and oil refining equipment and systems for cannabis, hemp, and botanical plants. Plant flowers can be turned into extracts and oils, and used in product formulations for both THC and CBD consumer products. We welcome anyone who wants to learn more about the industry to contact us (highpuritynaturalproducts.com) or visit for a tour."

1993

Chris Leary holds the post of principal software architect at Mutualink Inc. of Westford, Mass., where he works with **Jim Cahill '82**.

1996

John Crowley follows developments in neurology as principal business insights analyst in the CNS and Ophthalmology team at DRG, focusing primarily on MS and epilepsy. His work includes forecasting, primary market research, and market access. John earned his doctorate from UMass Medical School and was a postdoctoral fellow at Harvard Medical School, studying mechanisms that regulate the strength and dynamics of synapses.

1999

Fernando Correa Sevilla recaps his road to being appointed CEO of Sevilla y Martínez (SEMAICA) in Quito, Ecuador, this year. His graduate studies took him to Cornell University, San Francisco University of Quito, and Harvard Business

School. His resume includes serving as president of Servi Alimentos, a bamboo product company; leading several textile companies; and managing real estate projects. A LEED green associate and president of the Ecuador Green Building Council, he expressed his concern for the environment and his goal of implementing sustainable practices to fight climate change, noting that he's "always pushing for a conscious and sustainable construction industry in Ecuador, my home country." He's been a member of the Quito chapter of NexGen's Family Business Network, and has assisted the Por Manabí project of the NGO Ayuda Directa, created to support the reconstruction of the villages damaged in the earthquake of 2016 that occurred in Ecuador.

After 18 years with SEMAICA, "I was finally prepared to assume leadership of the most important construction company in Ecuador," he writes. "From small-scale family residences to huge hydro powers, the company has constructed all kinds of high-quality buildings and works that endure through the passage of time in Ecuador, Peru, and Bolivia."

2000

Kristin (Toy) Connarn joined the Boston office of Hogan Lovells as a partner in the firm's Intellectual Property, Media, and Technology practice. She was previously at McDermott Will & Emery. Her practice focuses on patent counseling, portfolio development, strategic planning, and patent prosecution for life sciences companies ranging in size from early stage/start-up companies to multinational pharmaceutical companies. Kristin received her JD from Suffolk University Law School in 2005. She brings prior experience as a molecular and cell biology research associate at AstraZeneca pharmaceuticals in Waltham, Mass.

2001

Asima Silva ('04 MS CS) traveled to Washington, D.C., for the first national meeting of the Muslim Caucus. She is vice president of communications for the organization. The two-day gathering, called "Phobia: Real and Present Danger in Our Political Discourse," was covered by WGBH News. Asima told the reporter, "We all have to think of ourselves as

Americans and equals, and once we start thinking of that, we can actually progress more towards an equitable democracy."

2002

After 10 years of building and growing MyBankTracker, **Jason Reposa**, CEO and co-founder, has successfully sold the company to QuinStreet, a performance marketing company out of the San Francisco Bay area. He continues to work on the product as senior director.

2004

Laurel (Rudge) Pickard is happy to share the news that she has taken a position as senior project engineer at HRP Associates in Farmington, Conn.

2006

David Gibson is running for a U.S. Senate seat in 2020, on the Maine Green Party ballot. He lives in Morrill, with his wife, Willow. After developing programs on energy efficiency for middle- and high school students, and working with the Nevada Governor's Office of

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Energy, he now works for ReVision Energy, designing solar and heat pump systems and helping Maine residents transition away from fossil fuels.

Dan Lanneville (MS CPM) was promoted to senior vice president and account manager of building operations at Boston-based Skanska. He will also spearhead Skanska's Special Projects Group (SPG), a specialized team that focuses on commercial fit-outs and business development. He brings more than 22 years of construction management experience, ranging from K-12 and higher education to healthcare and pharmaceutical. Prior to this role, Lanneville served as Skanska's director of SPG in Boston, working with notable institutions across the Commonwealth, including Harvard University, Boston University, Beth Israel Deaconess Medical Center, Dana Farber Cancer Institute, and Takeda Pharmaceuticals.



► MARY KATE (TOOMEY) DALY IS A MOM!

2008

Mary Kate (Toomey) Daly ▲ writes, "On July 11, 2019, my husband, Tom, and I welcomed our first child, Nathaniel Connor Daly, to the world. He arrived a few weeks early but everyone is doing well! After maternity leave is over, I'll be returning to work at AvalonBay Communities as senior manager, asset management."

Stacy Haponik began a new job at Western Connecticut State University as assistant archivist in the summer of 2019.

2009

Alex Schwartz shares that after eight years of building games and experiences with Owlchemy Labs, and a subsequent successful Google acquisition of his company, he took a year off to figure out what's next. "I traveled to over a dozen places all around the world, from Melbourne, Australia, to Reykjavik, Iceland, to Stockholm, Sweden, and Vancouver Island, Canada. By the end of the travels, I knew I needed to move back to Boston, so now I'm living in Central Square!

"With the year off finished, my co-founder and I are spinning up our next venture! We're going to be building a team to push forward on immersive technology (VR / AR / wearables) and create more of what we want to see in the world—positive, joyful, playful embodied experiences using bleeding edge tech. We have enough violent games out there and we'd rather focus on art, culture, positivity, and the new magical experiences that VR can afford." With funding in place, he expects to announce details of the new venture soon.

2011

Linnea Paton received the Association of Energy Engineers' 2019 International Young Energy Professional of the Year Award for her work in energy and sustainability management, campaign leadership, and academic excellence. She is an energy manager at Jones Lang LaSalle, working to help corporations meet their energy savings targets and sustainability goals. Her inspiration to address climate dates back to the 2007 Envirothon (international environmental science competition), which she won. In addition to her professional work, Linnea has played an active role in the development of energy policy in New York City and in building awareness of the importance of energy efficiency in her community. Her work detailing strategies for energy managers to improve their building's EnergyStar scores was recently published in the *Mann Report*, a commercial real estate



WPI'S SENIOR STATESMAN

Now 103 years old, **Mort Fine '37** lives in Stratford, Conn., where he keeps busy with the families of his daughter, Paula Fine Ridge, and his son, Philip Fine, which include six grandchildren, and five great grandchildren. "He is passionate about the Red Sox, and the UConn Huskies (especially the women's teams!)," Paula writes.

Mort moved to Hartford with his wife, Frances (now deceased), in the 1940s and began his career working on a large-scale flood protection project for the city. In 1950 he founded his own firm, Morton S. Fine & Associates, where he worked on state and private projects, including the Dinosaur State Park in Rocky Hill, Conn., an 80-acre park that protects one of the largest dinosaur track sites in North America.

In his later years he worked in the area of forensic engineering, providing technical expertise for both defendants and plaintiffs in litigation. He continued to work until he was almost 100 years old, often giving court testimony to the shock of those in the courtroom who were aware of his advanced age. He also enjoyed playing golf into his mid-nineties, traveled extensively around the world and regularly attends the annual Alden Society Luncheon on campus during Alumni Weekend.

"Mort attributes his good mental health largely to his love of music," Paula says. A clarinet player with The Boyntonians in his undergrad years, he later played with the Hartford Civic Orchestra and the Simsbury Community Band. He was also a member of the Klezmer band at Congregation Beth Israel and for about 25 years could be found each summer ushering at Tanglewood, where concertgoers always recognized him as the guy with the WPI cap.



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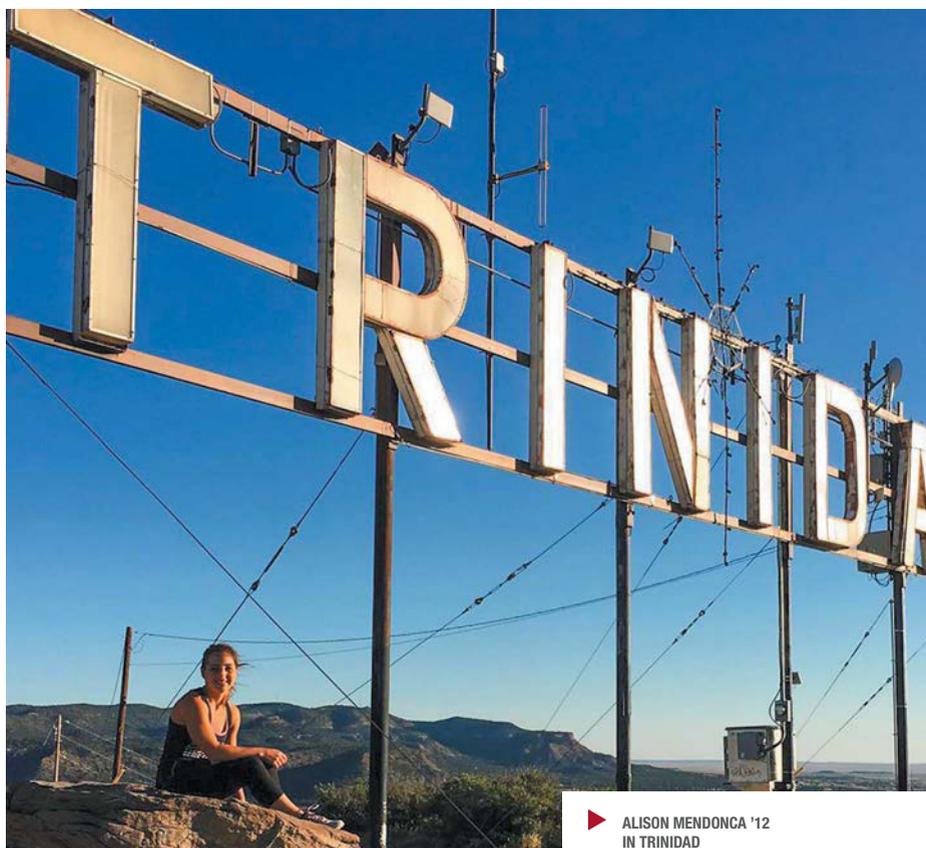
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▶ ALISON MENDONCA '12
 IN TRINIDAD

magazine, and she was a leader in 350NYC's successful campaign to divest \$5 billion of New York City pension funds from fossil fuels.

2012

An update from **Alison Mendonca ▲**: "Last time I wrote a class note I was training for IronMan Barcelona. Since then, I completed the race, moved to Germany, traveled a bunch, then moved to Colorado. I am now an AmeriCorps member serving in Trinidad, Colo. Here I will dedicate one year to teaching the community how to live a healthier life. Although I am no longer using my engineering degree (the one that each one of us worked so hard for), I still credit WPI for teaching me how to learn, communicate effectively, and accept challenges head on. Looking forward to where life takes me next."

Christopher Zoto (PHD CH) is currently in his third year of teaching as an assistant professor of chemistry at the Community College of Rhode Island. He currently resides in Woonsocket.

2013

Deacon **Alfredo Porras Suarez** was ordained by the Roman Catholic Diocese of Worcester in June, making him the third priest on the Porras side of his family and the first in the Suarez family. He is Worcester's first Venezuelan priest, and the first Latino who grew up in the city to be ordained. After attending Mount St. Mary's Seminary, he earned his bachelor's degree in sacred theology at North American College in Rome last year, where he was ordained a transitional deacon.

2014

Jordyn Ansari is a product engineer in the Linear Products and Solutions Group at Analog Devices, where she has worked since graduation.

Kelly McManus ▲ and Richard ("Mac") Siebler (Boston University '14) were married on Aug. 3, 2019, in Sharon, Mass. Kelly and Mac are both actuaries at John Hancock in Boston. Celebrating the wedding with them were WPI graduates spanning over 50 years, including (from left) **Brian McDonough '07**, **Kristen (Nich)**



► KELLEY MCMANUS '14 GOT MARRIED—AND WPI WAS THERE!

McDonough '13, Jack McManus '59 (the bride's grandfather), **Nick Nava '13, Chris Harvill '23** (cousin of the bride), **Riley McManus '18** (another cousin), **John McManus '82** (the bride's father), **Erika DiLorenzo '13, Emily Colpas '13, Megan (Forti) Ward '14, Caitlin Donovan '14, Molly (Mioduszewski) Best '14, Caryn MacDonald '14, and Mel Samaroo '14.**



► CONGRATS TO CHIANA '15 AND JOHN FLYNN '12

2015

Chiana (Montesi) and John Flynn '12 ► welcomed baby Jackson Reilly Flynn on August 7.

2016

From UW-Madison, **Katie Amato** writes, "I'm still pushing through grad school. I work with pandemic strains of influenza virus on a daily basis, so I would recommend getting vaccinated before visiting me in the Wisconsin tundra." She is pursuing a PhD in microbiology.

John Caliri ('17 MS FPE) received the Pat Ryan Team Spirit Award from his employer, Telgian. He joined the company as a fire protection consultant in 2018.

Jonathan Leitschuh made news with his discovery of a security vulnerability in Zoom conference software that allows the creation of a website with a link that will start Zoom running

silently and start the camera and microphone. His discovery of the privacy issue was featured in several media outlets, including *Wired*, and it prompted Apple to push out an update the next day to mitigate the problem.

2018

Tess Laffer is co-author of "Beginning anew—a wastewater treatment system design for Orleans," published in the Summer 2019 issue of *New England Water Environment Association's* magazine, *NEWEA Journal*. She is a water/wastewater engineer at AECOM in Chelmsford, Mass. As key participant in the Orleans project, she represented the company at a recent conference.

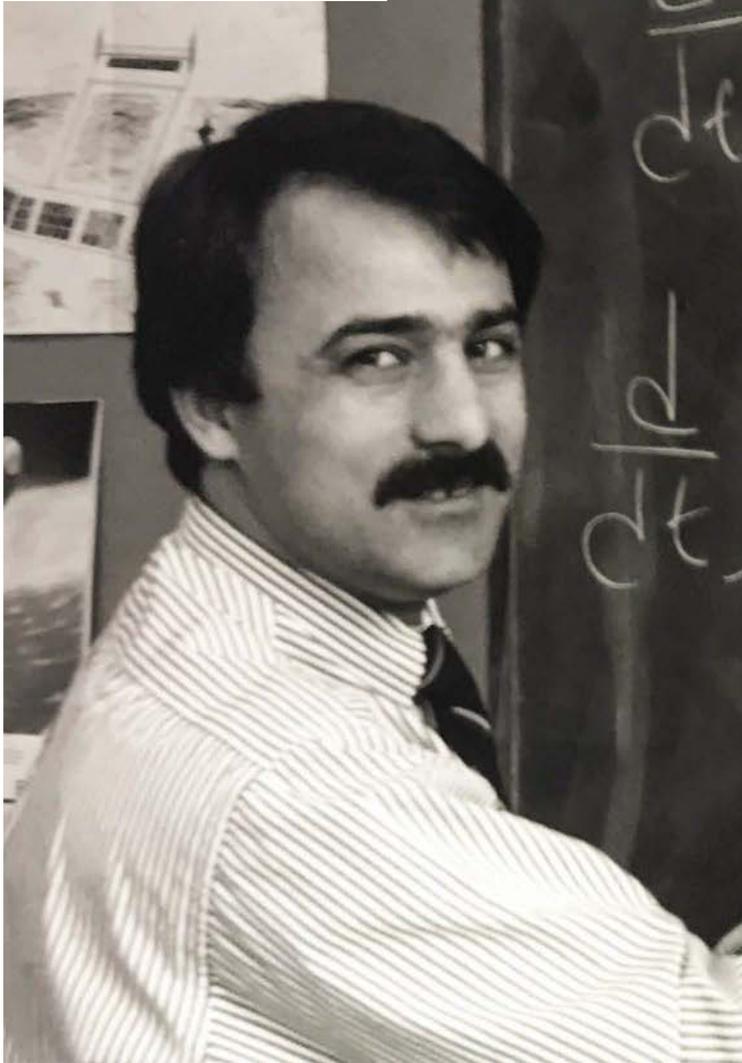


"CONGRATULATIONS. YOU ARE NOW CITIZENS OF THE UNITED STATES."

"The most satisfying PART of my job duties is conducting naturalization ceremonies and administering the oath to new citizens," says U.S. Magistrate Judge **Paul J. Cleary '71**. In his 17 years as a federal judge in the Northern District of Oklahoma, Cleary estimates that he's conducted 30 to 40 naturalization ceremonies, and sworn in 1,500 to 2,000 people. Recently, he administered the citizenship oath to 39 applicants from 17 countries at a ceremony at The Gathering Place, Tulsa's new, privately funded \$465 million park.

"For more than 20 years, our court has conducted naturalizations at sites outside the courthouse—particularly at local schools," he says. "It is a ready-made civics lesson for high school students. They study the material that applicants must master to become citizens and they attend the ceremony itself. After the applicants have taken the citizenship oath, I tell them, 'Congratulations. You are now citizens of the United States.' Invariably, the students erupt in cheers and applause. It's amazing how excited the students are for the new citizens. I think they really understand and appreciate the importance of something that they previously took for granted."

Cleary has served as a U.S. Magistrate Judge since 2002. He retired in 2016, but returned to service at the Court's request. In addition to conducting naturalization ceremonies, his time is spent administering the Court's civil mediation program and conducting pre-trial criminal hearings.



Andreas Alexandrou professor of mechanical engineering and an expert in Newtonian and non-Newtonian fluid mechanics, died May 31, 2018, at the age of 60, after a long battle with cancer. He joined the WPI faculty in 1987 and earned the rank of full professor in 1998. A respected researcher and a well-loved teacher, he received the Board of Trustees' Award for Outstanding Teaching in 1992, becoming the youngest faculty member to receive the honor. The following year he was appointed to the Morgan Distinguished Instructorship in Mechanical Engineering, and in 1996 the Russell M. Searle Instructorship in Mechanical Engineering.

In addition to his teaching duties, Alexandrou served as director of WPI's aerospace program from 1994 to 1998. He then succeeded his collaborator, Professor Diran Apelian, as the second director of WPI's Semisolid Metal Processing Center, a post he held from 1998 to 2001. After that, he returned to his homeland to assist the University of Cyprus in developing its School of Engineering, leading the Mechanical and Manufacturing Department and later serving as Dean of the School of Engineering. Although living abroad, he traveled to join his WPI colleagues on international delegations throughout the world.

Alexandrou's work on visio-plasticity and rheology had applications in the environment, in the processing of materials, and in wake flows. His research program received funding from industry, NASA, and the U.S. Department of Energy. In addition to his numerous scientific publications and conference presentations, he was the co-author of *Viscous Fluid Flow* and author of the undergraduate textbook *Principles of Fluid Mechanics*. He leaves his wife, Lisa Majaj, his daughter, Nadia, and his son, Nicolas.

John Bigelow '44, ME, '46 MS EE

Irving Gerber '44 EE, ALPHA EPSILON PI

Howard France '46 ME

Robert McGoldrick '46

Donald Soorian '46 EE, LAMBDA CHI ALPHA

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Conrad Supski '63 MS CE

Joseph Kerrissey '67 CE

George Fairbanks '68 EE

Thomas Burns '72 CE, SIGMA PI

Raymond Scanlon '72 MS, ALPHA CHI RHO

Michael O'Keefe '74 MSN

John Harvey '77

Yun-Shang Lin '78 MS, CHE

Stephen Caputo '79 EE, ZETA PSI

Christopher Mitchell '83 SIM

Lucy Elandjian '87 CHE, PHI SIGMA SIGMA

Michael Ciacciarelli '91 ME

Lydia (MacHatton) MacKovitch '94 MS CS

Robert Majewski '94 SIM

William Ross '97 MBA

Kevin Theroux '99 MS CS

Woodie Flowers, DEng (Hon.) '08

Timothy Perrault '11 RBE

Brian Bradley '14 MS SYS

Sayan Sengupta '16 MS IT

The WPI community also notes the passing of these friends of the university: **Sheila Bramande**, **Chester Ireland**, **Mary Kelley**, **Jacqueline Norsigian**, and **Robert Tucker**

Complete obituaries can usually be found online by searching legacy.com or newspaper websites. *WPI Journal* will assist classmates in locating additional information. Contact jkmillier@wpi.edu or call 508-831-5998.



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