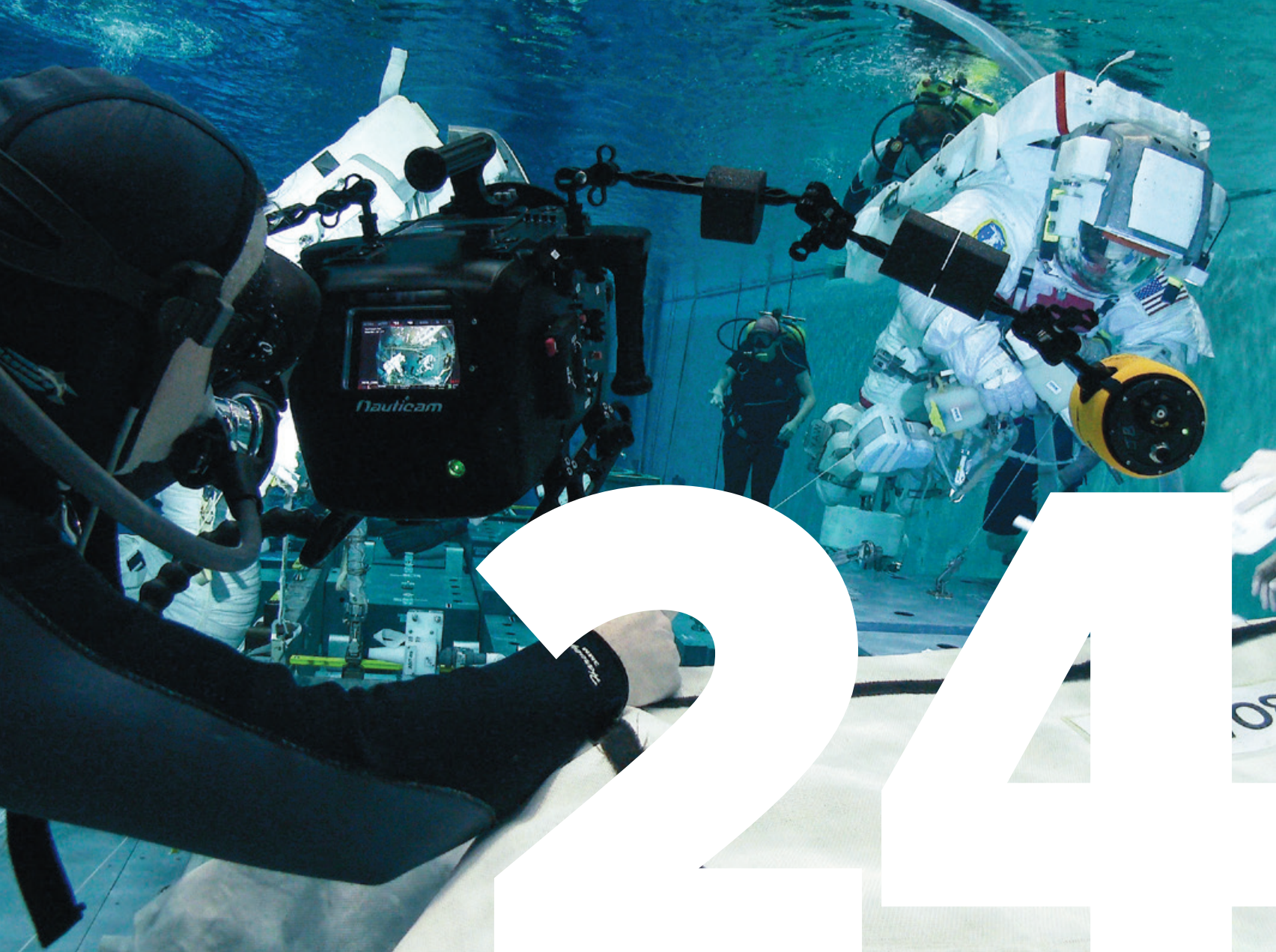


# Revealing the Ocean's Mysteries

UNDERWATER CINEMATOGRAPHER  
JONATHAN BIRD '90 TELLS THE  
STORY OF LIFE BELOW THE WAVES.





## REVEALING THE OCEAN'S MYSTERIES

Underwater cinematographer Jonathan Bird '90 tells the story of life below the waves.

BY JULIA QUINN-SZCESUIL

## 30 NOTHING LASTS FOREVER

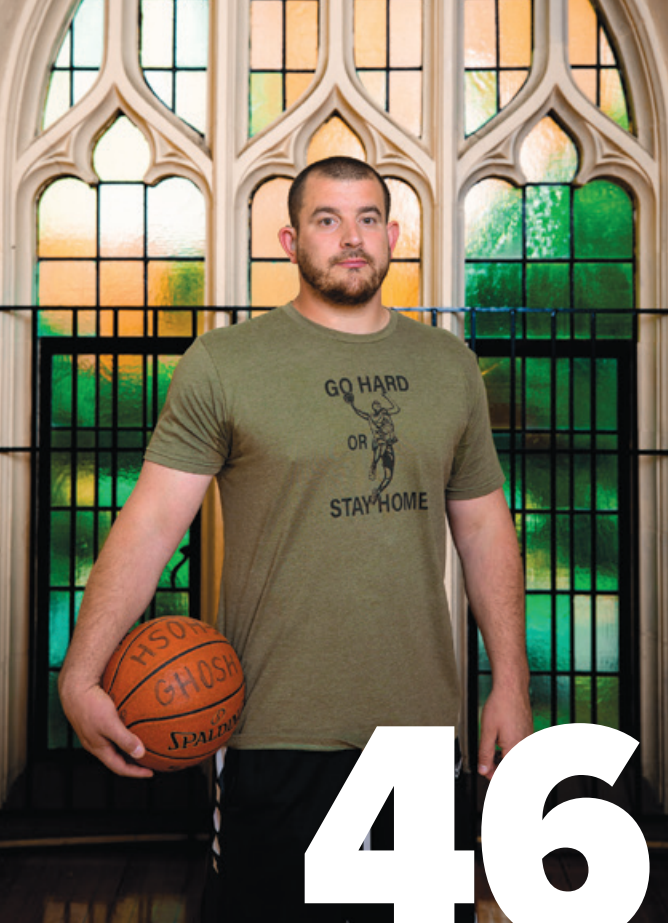
Julie Bliss Mullen '12 uses electrochemistry to sever the nearly unbreakable bond in forever chemicals.

BY AMY CRAWFORD | PHOTOGRAPHY BY JOHN GILLOOLY

## 36 REVOLUTIONARY TECH OR PANDORA'S BOX?

Faculty experts weigh in on what should excite and alarm us about ChatGPT.

BY KRISTEN O'REILLY | ILLUSTRATION BY PEPE SERRA



## 02 LETTERS TO AND FROM THE EDITOR

Is ChatGPT a helpful tool or your new editor? Plus, readers offer their own surprises.

## 03 A LETTER FROM THE PRESIDENT

Grace Wang writes that campus has been abuzz with a sense of community and excitement that spans generations.

## 04 WTI

The latest in university news, research, and commendations

## 14 WPI INSIDER

Jacob Morse '21, MS '23, wants to help cities adapt to climate change and keep the birds singing.

## 16 FACULTY SNAPSHOT

Get to know Carlo Pincioli, associate professor of robotics engineering and fire protection engineering, through items found in his office.

## 18 GLOBAL IMPACT

The Wall Street/FinTech Project Center delivers what corporate sponsors need—anything from building an app and analyzing a customer base, to developing tracker systems and utilizing cloud computing.

## 19 THE ARCHIVIST

In June 1926, Henry J. Fuller, Class of 1895, helped dedicate the Fuller Memorial Pool in Alumni Gymnasium in honor of his father and WPI's second president, Homer T. Fuller.

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## 20 Q&A

Rosanna Garcia, Paul R. Beswick Professor of Innovation and Entrepreneurship, answers questions about the entrepreneurial culture of WPI.

## 22 SENSE OF PLACE

More than 1,000 undergraduates crossed the stage on Saturday, May 13, including at least one who has her eyes on the C-suite.

## 43 ALUMNI NEWS

Find out what's up in the world of alumni and advancement.

## 46 TURNING POINT: RYAN BROWN '11

With lessons learned from his own challenges, Ryan Brown offers basketball clinics with a larger message.

## 48 ALUMNI PROFILE: CHANDLOR LYLE '16

Fashion entrepreneur and senior product IT manager Chandler Lyle stepped out of her comfort zone and is now thriving in Paris and New York City.

## 50 DONOR PROFILE: MATT RUNKLE '11

The Blair Clarkson and Matt Runkle '11 Fund supports students in need of the resources offered by the Office of Diversity, Inclusion, and Multicultural Education.

## 52 DONOR IMPACT: VALENTIN GAPONTSEV

A new fund that encourages innovation in photonics honors Valentin Gapontsev, an internationally recognized physicist widely known as the father of the fiber laser industry.

## 56 CLASS NOTES

Catch up on fellow alums—then send your news to classnotes@wpi.edu.

## 63 IN MEMORIAM

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



# LETTERS

Letters to the editor may be altered for length, clarity, and accuracy. Opinions expressed do not necessarily reflect the views of WPI. Send your letters to [wpijournal@wpi.edu](mailto:wpijournal@wpi.edu).

## A HELPFUL TOOL OR YOUR NEW EDITOR?

What happens when you ask ChatGPT to write a 300-word magazine editor's column about the use of ChatGPT in professional writing? In three seconds, it spits out six fairly coherent—if somewhat bland—paragraphs that tout the emerging technology as the best thing for writing since the Gutenberg printing press. I present an excerpt for your own judgement:

*The applications of ChatGPT are vast and diverse. From drafting persuasive marketing copy to crafting engaging blog posts, from developing gripping storytelling to refining technical documentation, this AI assistant has become an invaluable resource for professionals seeking to optimize their written communication. With its vast knowledge base and ability to adapt to different writing styles, ChatGPT serves as a trusted partner for both seasoned wordsmiths and aspiring writers alike.*

While “developing gripping storytelling” might be a stretch, I can see how refining technical documentation might be in its wheelhouse. (Our copy editor, Peggy, notes that using “both” and “alike” in the last line is redundant. Take that, ChatGPT.) To its credit, perhaps seeking to reassure the prompt writer, the AI-generated text does go on to define itself as a helpful tool, rather than a potential human replacement:

*However, we must recognize that while ChatGPT offers immense benefits, it does not replace the skills and expertise of human writers. The true power lies in the collaboration between human and machine, where the AI tool augments and enhances human creativity, rather than replacing it.*

[Visit the online version of the *WPI Journal* ([wpi.edu/+journal](http://wpi.edu/+journal)) for the entire answer to my prompt and judge for yourself if I should be concerned for my profession.]

Hardly a day goes by without another news story about how large-language models are about to upend our lives. It's no wonder a recent Critical Conversation panel discussion on ChatGPT by five WPI experts generated standing-room-only interest. That discussion, and follow-up conversations with the panelists, became the basis for the feature on page 36, which includes AI-generated illustrations of our experts. I considered asking ChatGPT to write the same article to compare the output, but some things are best left untested.

## Surprise, Surprise

I received two thoughtful answers to my query in the last issue: *What surprised you when you first joined the WPI community?* **Charles Innis**, who received his PhD in 1975 and taught as an adjunct professor later in his career, noted a strong familial connection to WPI, including the fact that his grandfather, Nelson E. Frissell, was a member of the Class of 1912.

“I started my PhD work in September of 1969, which turned out to be the start of the WPI Plan. That was a huge surprise. You cannot imagine the advising load that put on the professors, especially my advisor, Professor Hagglund, and his neighbor, Professor Boyd ... Their corridor, which ran from the main corridor to the west wall of Higgins, was packed with students trying to meet with their advisors, as was I.

“The Plan itself, though, was the major surprise. I had thought I was applying to a traditional engineering school—which it was, as far as the Graduate School was concerned. What I wound up being immersed in was a new approach to engineering education, which incorporated the humanities. On reflection, this pleased me no end. I had worked as an engineer for several years before coming to WPI and had engineers in my family, and was disappointed in how narrow-minded engineers could be. Perhaps I was spoiled—my mother and grandmother were Smith College graduates and humanities were part of my home environment—but I thought engineers were missing part of the richness of life through the limits of their education...And I was so lucky to have one of the drivers of the Plan, Ray Hagglund, as an advisor, even though I had to fight my way through shoals of undergraduates to see him.”

A second writer, **Tennyson Wang '58 (MS)**, mechanical engineering, offered welcoming words to WPI's new president, Grace Wang, along with his own moment of surprise:

“When I joined the WPI community in 1954 as an instructor in the mechanical engineering department, I was the first and the only Chinese faculty member. My real surprise was finding out that there were two prominent Chinese educators who had previously graduated from WPI. Mei Yi-Qi graduated in 1914 and subsequently became the president of Tsinghua University in Beijing, and Sa Ben-Dong graduated in 1924 and became a renowned physicist and the president of Xiamen University in China. The knowledge and spirit they obtained from the WPI community has since benefited students in China for decades. This could be a surprise to our new president and the WPI community.”

Keep those surprises coming.

—**Kristen O'Reilly**, Editor

## FOND MEMORIES OF PROFESSOR HAMMOND

I am so pleased by April Hammond's endowment in honor of her parents, Fahire and Professor Thom Hammond. I knew Professor Hammond and Professor Roy Bourgault before I started my PhD program at WPI through my ex-wife, who grew up on their street, Einhorn Road, and played on the WPI campus as April did. She was April's counsellor at Nature Training School in Holden, where I met the Hammonds.

I am pleased to remember working with Professor Hammond on my dissertation and in my many contacts with him as a graduate student. He was a great person to work with and really understood what I had accomplished. He encouraged me to present my work as an ASME paper and asked me to present it to his class. Knowing him was a highlight of my WPI experience and it is a tribute to him that his daughter, whom I know and respect, has created this endowment in honor of her parents.

—**Charles Innis '75 (PhD)**, mechanical engineering



The Hill beckons, and the late spring and summer are no exceptions. With trees flowering and Earle Bridge adorned, our beautiful campus has been abuzz with a sense of community and excitement that spans generations.

From WPI's Class of 2023 walking across the stage during WPI's 154th Commencement, to more than 1,000 elementary and middle school student roboticists from around the world attending the WPI FIRST Lego League Open Event, and esteemed members of the Class of 1973 celebrating their 50th reunion, the campus has been filled with joy, inspiration, pride, and gratitude.

Welcoming the Class of 2027, I shared with incoming students what I hear in virtually every conversation I have with alumni and current students: the profound impact of a WPI education within this highly supportive community.

Our alumni continue to reap and recognize the benefit of their education long after their days on the Hill are over—it comes across whenever I engage with them, as well as in the notes I continue to receive wishing me well in leading this storied institution. They tell me that their project work at WPI fully prepared them for life in the real world, that they know how to pivot when needed, work in a team effectively, and communicate clearly, and that their education has far-reaching effects, both personally and professionally. Consider this quote from an alumnus: “The strong sense of self-efficacy developed

*“The pace of technology adoption is accelerating ... We must continue to prepare our students to be ready for the future, motivated to better the world, and equipped to lead.”*

through rising to the challenge of these projects has served me well in uncountable ways.” And, just as critical, from an employer: “I always prefer WPI applicants because of their project experience ... and their ability to work on a team.”

The world is rapidly changing. Technologies are advancing. The pace of technology adoption is accelerating. Generative artificial intelligence is one of the examples of how fast technologies can be adopted today. We must continue to prepare our students to be ready for the future, motivated to better the world, and equipped to lead. WPI's project-based learning is more relevant and critical than ever.

Sincerely,  
Grace



The latest in university news, research, and commendations

# GROWING CELLS IN ENGINEERED HEART VALVES

ILLUSTRATION BY MARCO MELGRATI

WPI researcher **Kristen Billiar** has been awarded \$429,456 from the National Institutes of Health to investigate how stretching and blood flow can inhibit or encourage cardiovascular cells to populate and grow in tissue-engineered heart valves. The three-year project focuses on experimental valves that are not yet used in humans, and the work will expand understanding about how mechanical forces propel cells in the body.

Billiar will lead microfluidic laboratory experiments that will stretch tiny amounts of biopolymer materials and expose them to fluid flows to examine how cells attach, proliferate, and migrate. A total of 18 undergraduate students will be involved in the project.

The project builds on Billiar's previous work, which has examined how cell death leads to calcium deposits in heart tissue that cause aortic valves to fail and how mechanical forces and stresses affect programmed cell death.

When valves cannot be surgically repaired, doctors may replace a damaged valve with a mechanical valve made of durable materials such as carbon, or a valve made from animal or human heart tissue. Both types of valves, however, have limitations: Patients with mechanical valves must take blood thinners regularly to avoid clotting problems, and valves made from living tissue break down over time. More than 200,000 heart valves are replaced worldwide every year.

Experimental technologies involve using materials such as polymers, similar to those used in absorbable surgical sutures, or biopolymers such as collagen, to build scaffolds that could be implanted in a heart valve. Over time, the body's heart cells would grow a new living valve on the scaffold.

"Cancer and wound healing occur in moving tissues, too," Billiar says. "My lab group hopes that our work will encourage researchers to adopt dynamic, moving methods to study how cells move, grow, and differentiate into other types of cells in the body."

—Lisa Eckelbecker

## WPI, HONEYWELL PARTNER ON HYDROGEN FUEL CELL SOLUTIONS FOR AIRCRAFT

A new partnership between WPI and Honeywell Aerospace is aimed squarely at helping the aviation industry reduce its carbon footprint by examining how hydrogen fuel cells can help power the next generation of aircraft.

This work focuses on hydrogen storage and power generation technology for all forms of air travel, including unmanned aerial vehicles, passenger, and cargo travel. Honeywell is supplying hydrogen equipment and technology expertise, and has established a significant presence on WPI's campus.

"The aviation industry has recognized an imperative to de-carbonize, which is extremely challenging in the weight- and volume-constrained environment of an aircraft. Hydrogen, along with sustainable aviation fuels and aircraft electrification, represents a huge opportunity for the aerospace industry to meet the UN's 2050 climate targets," says **Andrew Teixeira**, assistant professor of chemical engineering and project lead on the WPI team.

Through this new collaborative, roughly 25 Honeywell team members are working together with WPI experts and students under a multiyear contract to develop hydrogen storage and fuel cell technologies. Honeywell is currently using these technologies for unmanned aerial vehicles, and the Honeywell-WPI team is investigating hydrogen solutions for unmanned aerial vehicles, cargo drones, air taxis, and even larger aircraft that could one day power commuter and regional flights without petroleum fuels. According to the International Energy Agency, aviation accounted for 2.8% of global CO<sub>2</sub> emissions from fossil fuel combustion in 2019, but this percentage is projected to grow as other industries decarbonize and air travel continues to expand.

"For the past several years we've ramped up our exploration of hydrogen solutions—both combustion and fuel cells—as well as other ready-now technologies that help our customers create a more sustainable future," says Phil Robinson, senior director of Zero Emissions Aviation at Honeywell Aerospace. "We're excited to bring unique clean technologies to our aviation customers, and also help guide WPI research in as-of-yet unexplored areas."

—Steve Foscett





# EXPANDING ACCESS TO GLOBAL PROJECTS

WPI was awarded a 2023 Institute of International Education (IIE) Andrew Heiskell Award in the category of student mobility and exchange for its ongoing efforts to expand access to the university's Global Projects Program.

The award promotes and honors outstanding initiatives in international higher education by recognizing innovative and successful programs in several categories. It is named after Andrew Heiskell, a former chairman of Time Inc., a member of the executive committee of IIE's Board of Trustees, a renowned international and cultural philanthropist, and a longtime supporter of international education.

WPI received the award for its Global Projects Program and Global Projects for All initiative. A signature component of WPI's project-based learning model, the Global Projects Program facilitates student travel to

more than 50 project centers across the USA and in 30 countries around the world.

Global Projects for All aims to develop new centers, increase the number of terms that programs are offered at existing centers, and offer more financial assistance to all students. The goal is to remove financial barriers and create opportunities for students of all backgrounds to access the award-winning, off-campus opportunity for immersive experiential learning.

This core program of The Global School combines STEM-centered education with the promotion of integrative global learning at the intersection of science, technology, and society.

—Steve Foscett

and project-based learning taught by distinguished faculty who will prepare learners for the analytics-based positions needed by companies wanting to keep a competitive edge.”

Numerous organizations, including the World Economic Forum, report skilled data analysts are some of the most sought-after professionals in the world. A focus on business analytics—bringing together the disciplines of management, data science, business intelligence, machine learning, statistical analysis, and computing—further equips individuals and groups with insights that improve efficiency and encourage optimized processes through data-driven decisions. The business analytics master's degree is specifically designed to upskill the Nigerian workforce, creating future business leaders who want to be fully equipped to start or advance their careers.

In courses led by Business School faculty, who are scholars and industry leaders, students will use state-of-the-art business analytics tools and techniques to think and act entrepreneurially, organize and draw insights from complex data, and use analytics to inform business strategies while working on real-world projects.

—Colleen Bamford Wamback

## PARTNERSHIP ADVANCES STEM LEADERS IN NIGERIA

Two universities focused on nurturing future global leaders are teaming up to meet a growing demand for one of the fastest-growing fields in Africa: business analytics. Beginning in fall 2023, The Business School will offer its Master's in Business Analytics alongside Nigerian University of Technology and Management's Professional Certification in Design Thinking Leadership Principles. The business analytics courses will be offered online to students in Nigeria, where there is strong workforce need to catalyze the region's rise as a technology and entrepreneurial hub.

“Business analytics is a necessary competency for any organization that wants to make actionable, data-driven business decisions,” says **Debora Jackson**, the Harry G. Stoddard Professor of Management and dean of The Business School. “As a leading STEM-based business school, our master's in business analytics degree provides the perfect blend of business, technology,



## RESEARCHERS EXPLAIN 'NOSTALGIC BRAND LOVE'

What drives consumers to organize and fight for the revival of discontinued candies, pizzas, sodas, and other brand-name products? **Purvi Shah**, associate professor of marketing in The Business School, answers the question in new research that describes one piece of the phenomenon as “nostalgic brand love.”

Part love for a brand and part nostalgia for a past when the brand was popular, nostalgic brand love is a new term coined by Shah and her collaborators to describe the longing to buy and consume a beloved brand that is not available anymore. In research published in the *Journal of Brand Management*, Shah says nostalgic brand love can be powerful fuel for online consumer campaigns aimed at resurrecting dead brands.

“Companies delete brands for a variety of reasons, and consumers have historically protested those decisions, especially if they loved the brand,” Shah says. “Today, the internet has transformed consumer activism. Consumers now have easy access to online petitions, company websites, and communication channels on social media. Digital tools have made it possible for brand fans to successfully compel companies to revive brands.”

Shah and her research collaborators focused on a specific campaign that succeeded in bringing Surge, a Coca-Cola beverage, back to the market. Surge was launched in 1997, discontinued in 2004, and revived in 2014 after fans lobbied for Surge with a website, online petitions, and a Facebook fan page that drew more than 350,000 people.

Shah says the findings could help brand managers better understand what drives customers to protest brand deletion. This will help brand managers make an informed decision about bringing back a deleted brand so that it not only delights the nostalgic consumer and fan base but also enhances revenues and profits of the revived brand.

—Lisa Eckelbecker

## SOLVENT-FREE PROCESS MAKES BETTER, CHEAPER LITHIUM-ION BATTERY ELECTRODES

A team led by researcher **Yan Wang** has developed a solvent-free process to manufacture lithium-ion battery electrodes that are greener, are cheaper, and charge faster than electrodes currently on the market, an advance that could improve the manufacturing of batteries for electric vehicles.

In the journal *Joule*, the group reported on a dry-print manufacturing process that avoids the toxic solvents and the long drying times needed when manufacturing electrodes with slurries and conventional production methods. Wang, who is the William B. Smith Dean's Professor in the Department of Mechanical and Materials Engineering, says the new process could be scaled up and reduce electrode manufacturing costs by up to 15 percent, while also producing electrodes that can charge faster than conventionally produced electrodes.

“Current lithium-ion batteries charge too slowly, and manufacturers typically use flammable, toxic, and expensive solvents that increase the time and cost of production,” Wang says. “Our solvent-free manufacturing process addresses those disadvantages by producing electrodes that charge to 78 percent of capacity in 20 minutes, all without the need for solvents, slurries, and long production times.”

Commercial lithium-ion battery electrodes are typically made by mixing active materials, conductive additives, polymers, and organic solvents to create a slurry that is pasted onto a metal substrate, dried in an oven, and cut into pieces for use in batteries. The solvents are recovered through distillation.

The researchers' process, in contrast, involves mixing together dry powders that were electrically charged so they would adhere when sprayed onto a metal substrate. The dry-coated electrodes are then heated and compressed with rollers. Skipping the conventional drying and solvent-recovery process cuts battery manufacturing energy use by an estimated 47 percent, the researchers reported.

Wang has long been focused on improving lithium-ion batteries and reducing the waste they create. He co-founded Ascend Elements, a company that is developing battery recycling technologies. His electrode manufacturing work has been funded by the Department of Energy with the United States Advanced Battery Consortium LLC and the Massachusetts Clean Energy Center. Collaborators on the project included **Yangtao Liu '22 (PhD)**, graduate student **Jinzhaoh Fu**, Assistant Research Professor **Xiaotu Ma**, **Panawan Vanaphuti '22 (PhD)**, and **Rui Wang '23 (PhD)**, all of WPI; and researchers at Texas A&M University, Rice University, Microvast Inc., Argonne National Laboratory, and Brookhaven National Laboratory.

—Lisa Eckelbecker





## ROBOT FOOD DELIVERY SERVICE LAUNCHES

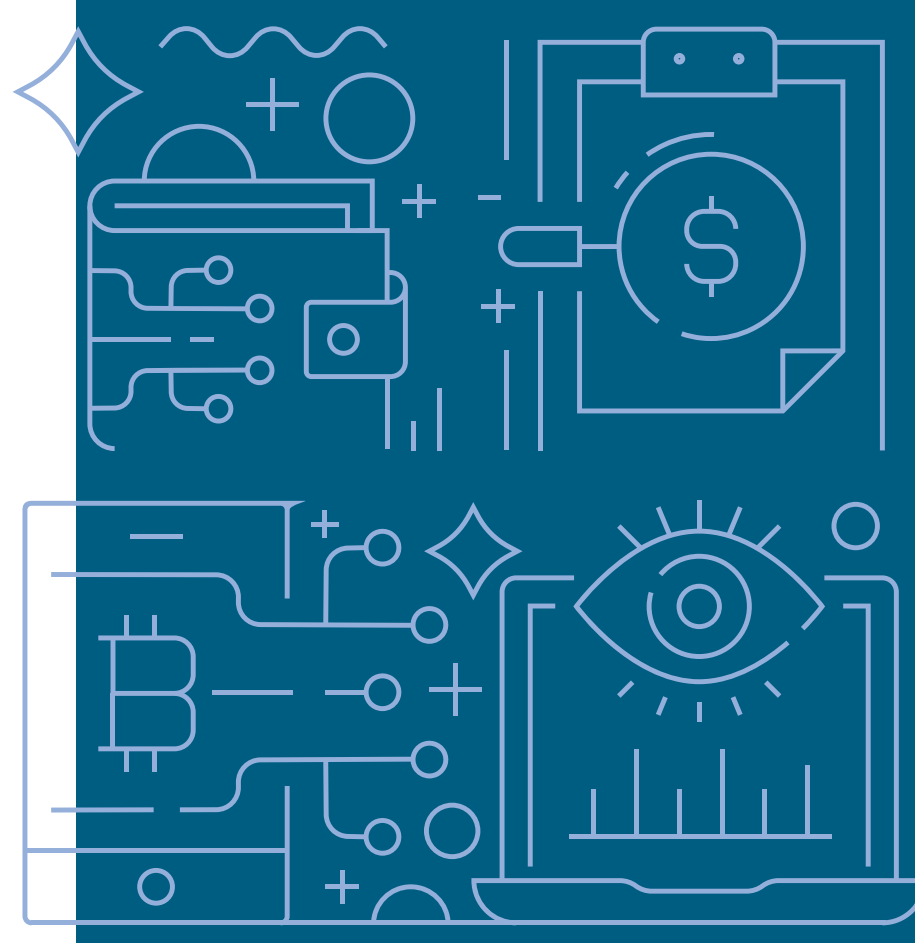
Starship Technologies rolled out its on-campus robot food delivery service this past spring. The cooler-sized robots also ventured onto a select number of surrounding city sidewalks to meet off-campus student demand.

Starship's fleet of 12 autonomous, robots delivers from several specialty-focused, on-campus eateries, including Innovation Kitchen, Joy Empanadas, and Halal Shack, that serve WPI's more than 7,000 students, staff, and faculty.

The robots use a combination of sophisticated machine learning, artificial intelligence, and sensors to travel on sidewalks and navigate around obstacles. Their computer vision-based navigation helps the robots map their environment to the nearest inch. A team of humans can also monitor their progress remotely and can take control at a moment's notice.

To start the delivery process, users open the Starship Deliveries app, choose from a range of their favorite food or drink items, and drop a pin where they want their delivery to be sent. They then can watch via an interactive map as the robot makes its journey to them. Once the robot arrives, the user receives an alert, and can then meet and unlock the delivery compartment through the app.

—Steve Foskett



## NEW BS AND MS DEGREES REFLECT HIGH DEMAND FOR FINTECH

WPI is regularly at the forefront of innovation, so it's no surprise that the university recently launched new bachelor's and master's degrees in financial technology, more commonly known as "FinTech." It's a term used to describe new technology that improves the delivery and use of financial services for companies, business owners, and consumers. At first glance, it may seem as though FinTech's home should land primarily on Wall Street but, really, it's applicable anywhere and everywhere.

"[Financial Technology] is in all areas, all companies; it's naturally interdisciplinary," says Professor of Practice in The Business School **Robert Sarnie**. "It's not just about a balance sheet and income statement."

With coursework in mathematics, computer science, and business, the FinTech degree will give students all the resources, skills, and support they need to develop competencies in everything from predictive analytics and programming to corporate innovation and financial modeling. The high-demand field offers roles ranging from blockchain or application developer and financial analyst to business development manager and cybersecurity analyst. Both undergraduate and graduate students may apply for the program starting in the fall of 2023.

—Allison Racicot



## WPI'S FIRST MFA

**Laurie Mazza '23** says merging technical and artistic approaches is the way of the future. As WPI's inaugural graduate of the Master of Fine Arts (MFA) degree program in Interactive Media and Game Development (IMGD), she's more than happy to be on the leading edge of this untapped potential in technology—particularly when it comes to creating immersive and interactive experiences.

The MFA, a terminal art degree, is helping Mazza push technology to its limits and experiment with using it in new ways. She continues building on a foundation of professional, technical, and artistic skills gained from her three other WPI degrees—a bachelor of arts degree in IMGD ('18), and a bachelor of science ('18) and a master of science in computer science ('22).

**Farley Chery**, associate professor of teaching in IMGD and Mazza's graduate advisor, says the MFA has distinct benefits in a tech-focused school. "While the MFA uses science and the scientific method, we use it for

expressiveness," he says. "It isn't about proving a hypothesis. The technical focus is on how to get the most out of the tools to become the Leonardo da Vinci of our time, by blending art, science, and technology." But the teaching mentorship aspect of the MFA program encourages students to explore creativity and leadership in entrepreneurial pursuits, he says.

That freedom to explore, both with individual pursuits and through the collaborative project-based work with teams of students, was essential to Mazza as a full-time graduate student. While earning her MFA, she gained additional innovative and educational skills with work in WPI's Intentional Design Studio and also as a teaching assistant and instructor for the Pre-Collegiate Outreach Programs.

"Achieving success in artistic practice is particularly meaningful to me," she says. "It has demonstrated that technical skills and creative skills are not mutually exclusive and can be combined to create unique and innovative solutions. I hope that my achievement in this degree program will inspire others to explore their creative potential and contribute to various fields blending art and technology."

With her MFA, Mazza plans to continue to push creative bounds using technology as a tool. The approach, she says, lets her bring worlds that only existed in imagination to life—and create a bridge between the two. Inspired by her own mentors, Mazza plans to pass her knowledge on, whether it is through a formal academic role or through professional mentoring. She believes strongly in using her knowledge and skills to inspire and educate others.

—Julia Quinn-Szcesuil



## BS/MS OPTION EXPANDS LEARNING SCIENCES & TECHNOLOGIES PROGRAM

WPI has launched a five-year BS/MS option that allows students to pursue a bachelor of science degree in any major and a master of science degree in learning sciences and technologies, an interdisciplinary field focused on how students in kindergarten through 12th grade learn and the tools and techniques that can make education more effective.

The BS/MS option represents an expansion of WPI's Learning Sciences and Technologies program, which brings together computer and data scientists, psychologists, and mathematicians. The program launched in 2010 offering MS and PhD degrees, and it concentrates on student learning in the fields of science, technology, engineering, mathematics, and English.

Faculty members blend social and scientific approaches in research that has been supported by more than \$85 million in funding from the National Science Foundation, the U.S. Department of Education, and private foundations. The research has led to technologies shown to improve teaching and learning in schools across the country, such as ASSISTments, a digital math platform developed by William Smith Dean's Professor of Computer Science Neil Heffernan, and Associate Professor Erin Ottmar's products related to Graspable Math, an algebra learning platform.

The BS/MS option gives students an accelerated pathway to two degrees by counting certain courses in computer science, data science, psychology, mathematics, and business toward both an undergraduate and graduate degree. An undergraduate's Major Qualifying Project can count toward both degrees. This newest BS/MS is hosted within the School of Arts and Sciences, one of WPI's four schools and a major contributor to the university's interdisciplinary programs that bring together different fields to create opportunities for students to gain cross-disciplinary skills.

—Lisa Eckelbecker

## AWARDS, HONORS, AND RECOGNITIONS

### Michelle Ephraim Wins Juniper Prize

English professor and celebrated Shakespeare scholar **Michelle Ephraim** has been awarded the 2023 Juniper Literary Prize for Creative Nonfiction for *GREEN WORLD: A Tragicomic Memoir of Love and Shakespeare*. The Juniper Prizes are a highly competitive and a well-regarded showcase of distinctive and fresh voices who share their work with a wide array of readers. *GREEN WORLD* is a story of how the boundaries between Ephraim's life and those of Shakespeare's characters seemed to vanish. The memoir unfolds as a sort of literary detective drama; its five-act structure creates a story within a story, in which her life uncannily starts to mirror that of the fictional Jewish daughter in Shakespeare's *The Merchant of Venice*.

### Dana Harmon Named Division III Athletic Director of the Year

Director of physical education, recreation, and athletics **Dana Harmon** recently received a 2022–23 Division III Cushman & Wakefield Athletic Director of the Year Award. The award honors athletic directors at all levels of collegiate competition for their contributions to student-athletes, campuses, and their surrounding communities. Winners were recognized in June at the 58th Annual National Association of Collegiate Directors of Athletics & Affiliates Convention at the World Center Marriott Resort in Orlando, Fla.

### Jean King Selected for NIH Council of Councils

Peterson Family Dean of the School of Arts and Sciences **Jean King** has been selected to serve on the National Institutes of Health (NIH) Council of Councils. A widely respected neuroscientist and researcher, King joins 26 other council members who advise the NIH director on policies and activities of the Division of Program Coordination, Planning, and Strategic Initiatives. This includes making recommendations on research that represents important areas of emerging scientific opportunities, rising public health challenges, or knowledge gaps that deserve special emphasis or would otherwise benefit from strategic planning and coordination. Each council member also represents an institute or center that falls under the NIH. King has been appointed to the National Center for Complementary and Integrative Health.

### Tian Guo Receives CAREER Award for AR Research

Researcher **Tian Guo** has been awarded a prestigious \$657,776 CAREER Award from the National Science Foundation to develop novel software techniques that will improve the performance and privacy of mobile augmented reality (AR) systems, an increasingly popular technology that superimposes computer-generated images on a user's view of the real world. Guo, an assistant professor in the Department of Computer Science, will focus her five-year project on edge computing, which involves processing data close to its physical source. She will develop techniques to efficiently manage edge servers that are close to AR users whose mobile devices are interacting with the servers. The proposed techniques will be prototyped with commercially available edge servers, and the resulting software and hardware bundles will be deployed to support indoor AR use cases.



MICHELLE EPHRAIM



DANA HARMON



JEAN KING



TIAN GUO

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## CELEBRATING THE LIFE AND LEGACY OF **WILLIAM B. GOULD III**

Community members using the campus-level entrance of Unity Hall can view a new plaque honoring the life and accomplishments of pioneering alumnus **William B. Gould III**. The entrance way was made possible by a gift from former President Laurie Leshin and her husband, Jon Morse, in recognition of Gould's revolutionary work and illustrious career in radio and radar.

An electrical engineering major who enrolled in the university in 1921, Gould was among the first African Americans to attend WPI. He was active in the early days of the WPI Wireless Association, which at the time was one of only three college wireless associations in the country. Gould was called to service in World War II as an electrical engineer, where he provided support for development of long-range guidance systems for Cape Canaveral. He went on to a distinguished career and made major contributions to the electrical engineering field.

The Unity Hall entrance plaque unveiling was held in May on the 100th anniversary of Gould's death and included a reception with Gould's son, William B. Gould IV, and his wife, Hilda. President **Grace Wang**, Provost **Wole Soboyejo**, and university deans were in attendance. The event, led by University Librarian **Anna Gold**, also included a luncheon, and a point-to-point wireless connectivity demonstration presented by Professor **Alex Wyglinski** and students from the Wireless Innovation Laboratory.

Speaking at the reception with heartfelt emotion, Gould shared, "My father taught me something he learned at WPI that I will never forget. He explained that engineers were always seen as narrow people. But that way of thinking was wrong. Good engineering schools teach people about the arts as well as the sciences. And when I look at WPI and the way WPI is going forward, that is exactly what I see."

—Sira Naras Frongillo

*"I am so appreciative and honored. This is a very exciting day for me and for my family, and I know it would have been for my father, too. He was the greatest man I ever knew, and I am so honored to see him recognized in this way. I just wish he were here to see this."*

—William B. Gould IV

See how WPI students put theory into practice through projects.

# PROJECT

## 'ROPELESS' LOBSTER TRAPS PROTECT RIGHT WHALES

**THE STUDENTS:** Caylee Butler '23, Slater Campbell '23, Trevor Parks '23, Charles Snow '23

**THE ADVISOR:** Professor William Michalson, Robotics Engineering

### THE PROBLEM:

Lobster fishing is critical to New England, but the ropes that connect traps to buoys pose a threat to the endangered North Atlantic Right Whale. With less than 350 of these whales left, conservationists are calling upon solutions to keep the species from going extinct. Lobstermen using traditional traps have been limited to where or when they can fish, but current ropeless traps can cost thousands of dollars.

### THE SOLUTION:

The team developed the Lobster Resurfacing Oceanic Locator, or Lobster R.O.L., which keeps a buoy and coiled rope submerged with a trap until a designated time set by a user on a smartphone app. At the specific time, the buoy and rope release, allowing lobstermen to find and collect their traps. The students interviewed lobstermen and industry workers to develop an easy-to-use prototype that costs about \$200, and they successfully tested it in a swimming pool and in Narragansett Bay.

### THE FUTURE:

The students are working with WPI to patent the invention and plan to continue working on the project even after graduation.

Watch a video of the project by scanning the QR Code at right.





## JACOB MORSE WANTS TO HELP CITIES ADAPT TO CLIMATE CHANGE

FIRST MASTER'S IN COMMUNITY CLIMATE ADAPTATION GRADUATE KEEPS THE BIRDS SINGING.

As both an undergraduate and a graduate student, **Jacob Morse '21, MS '23**, was heavily involved in the music scene at WPI. "I did choir all four years, was in an a cappella group, and did a lot of theatre productions," he says, adding that he also held leadership positions in choir, musical theatre, and other music groups on campus. "I just really like conducting and singing."

In a way, it's fitting that he chose to pursue a master's degree focused on the environment and remediating the effects of climate change—all, the birds need somewhere to sing, too.

### A Shift in Focus

A native of San Antonio, Texas, Morse first stumbled upon WPI after a friend applied to the robotics engineering program. WPI's environmental engineering program appealed to him, so Morse followed his friend's lead.

"Once I got here, my interests eventually began to shift more into conservation and focusing on our environment, nature, and remediation," he says. "The more I learned in my classes, the more I learned that I was more interested in the science aspect of STEM rather than engineering."

That revelation eventually led him to swap out his environmental engineering degree for one in biology with a concentration in environmental biology. By the time Morse entered his senior year, The Global School had announced a new degree program, the MS in Community Climate Adaptation. The collaborative, research-based program focuses on teaching students to address the challenges that come with climate change as well as the ability of communities around the world to adapt to them, matching up well with Morse's goals of working with local governments, cities, and neighborhoods to address climate change.

"It's been really cool," Morse says, noting that while he was the program's only full-time grad student, a handful of students were also earning the degree through WPI's BS/MS program. "It's been flexible, so I've been able to shape my studies into something I really want and enjoy."

Part of Morse's studies included the Graduate Qualifying Project, or GQP, an immersive, extended research project experience similar in scope to the IQPs and MQPs of undergraduate students. His work focused on the city of Springfield, Mass., and how to better assist residents more vulnerable to heat emergencies, the urban heat island effect, flooding, and other negative effects of climate change.

"They're aware that the city needs to start to adapt," Morse explains, "but they're not sure how to fund potential projects, or where to begin."

That's where Morse came in. He discussed with residents and local government officials how climate change fit with the city's overall

planning efforts and reviewed an adaptation and mitigation plan shared with the city by the Pioneer Valley Planning Committee several years ago. Morse was tasked with adapting these recommendations into something conceivable.

"There are parts they were really receptive to, and then parts that had been deemed kind of impossible, so they stopped trying to do it," Morse explains. "Part of my recommendations touched upon how they could take those impossible things and make them possible."

Morse's GQP gave him the chance to not only contribute to real-time efforts and learn the ins and outs of how cities are structured and how they function, but to learn about green infrastructure and its different uses—everything from rainwater harvesting and rain gardens to the utilization and accessibility of cooling centers for those without homes or air-conditioning.

"They're all programs and strategies that deal with human resilience," he says, "and it'll all prove useful, especially if I end up working with a government official who wants to utilize them."

### A Passion-Filled Future

Now that Morse's time at WPI has wrapped up, he's begun his job search with plans to continue the type of work he completed for Springfield, either as part of a city's planning operation or as a member of the local parks and recreation department. As someone who's completed both his bachelor's and master's degrees at WPI, Morse is in a unique position to reflect on his own time in Worcester, and also offer advice that's applicable to both undergraduate and graduate students.

"School is important, but it's also important to put yourself out there and find what you're interested in," he notes. "Take advantage of all the clubs to better understand yourself."

Following that message himself has allowed Morse to not only earn his groundbreaking MS—he crossed the stage during Commencement in May before officially completing his degree in early June—but continue pursuing his passion for music, ultimately ending his time at WPI with one last musical hurrah as part of the senior a cappella group that performed at this year's baccalaureate ceremony.

While Morse is still deciding what's next, that aforementioned sendoff makes it clear that he'll keep the singing going. And thanks to his work, others—including the birds—will be able to as well.

—Allison Racicot

PHOTO BY MATTHEW BURGOS

# INSIDER



## Carlo Pincioli

ASSOCIATE PROFESSOR OF ROBOTICS ENGINEERING  
AND FIRE PROTECTION ENGINEERING

### CAMERA

This infrared camera is part of the Vicon motion capture system that makes it possible to perform complex experiments with robot swarms in laboratory conditions.



### TOY

This toy bug is inspirational in that it can navigate a cluttered environment despite having no brain.

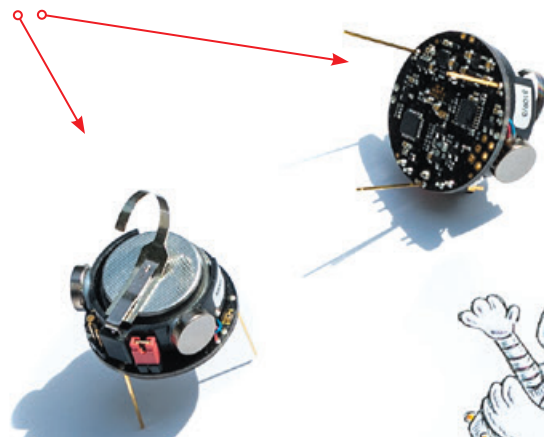


### 3D PRINTED CAT

When I acquired a 3D printer for my laboratory, I asked students to test it on something that would immediately be useful to research. The students made this cat to remind me of all the times one of my cats entered a Zoom call.

### KILOBOTS

These \$15 robots enable large-scale experiments on robot coordination in a space as large as a whiteboard. Individually, these robots have severe limitations in terms of computation, communication, and motion; they can't do much. However, when dozens of them collaborate, collective intelligence emerges.



### ROBOT ILLUSTRATION

For my first Father's Day, my wife, Rachael, had this drawing made by an artist.

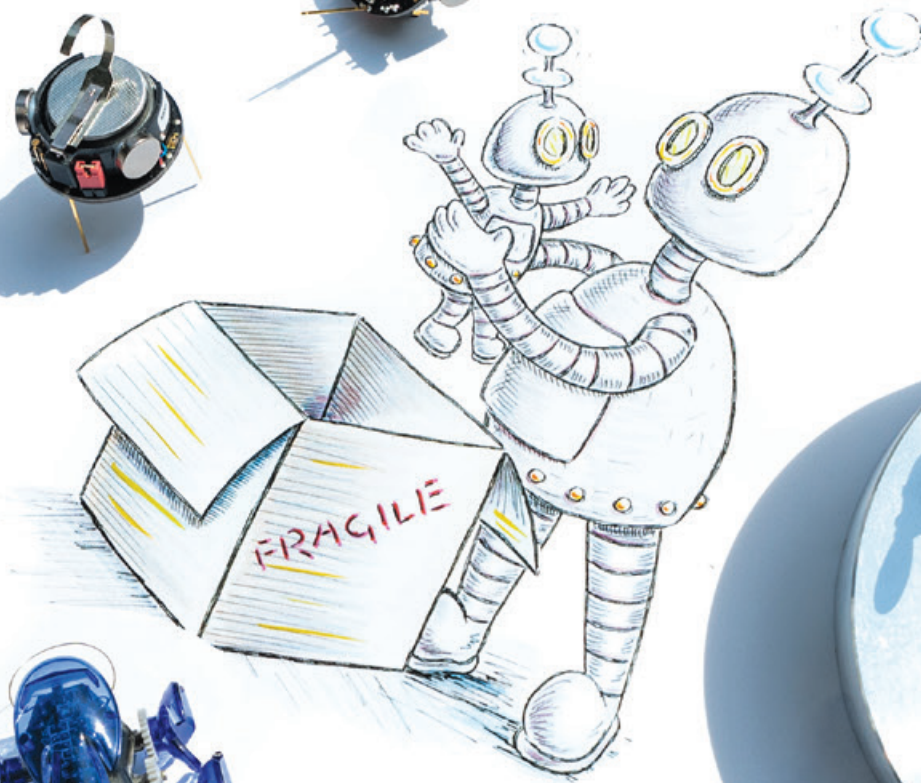
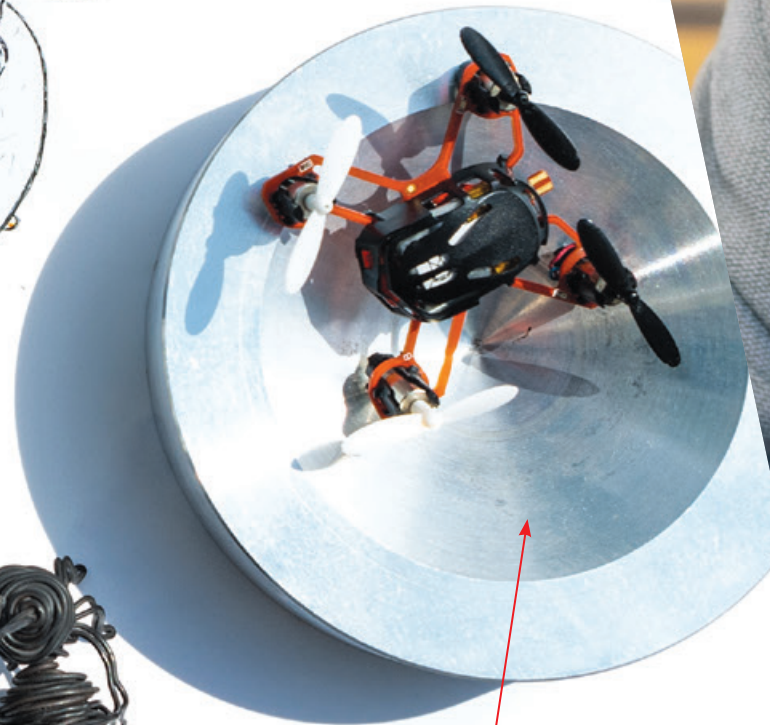


PHOTO BY TODD VERLANDER

### MINI DRONE

Flying this remote-controlled Mini Drone in my office is one of my favorite guilty pleasures.



### METAL DISH

While working on my master's thesis on omnidirectional robotic vision, I needed a conical mirror to run validation experiments. I drew the cone shape, sent it to a machine shop, and waited for the shiny mirror to be delivered. Instead, a month later, I received a hole in the shape of a cone. Despite this, I got my degree and learned a lesson on the value of clear design specifications.

### METAL ANT

I received this metal ant on my last day in Belgium from my PhD supervisor, Professor Marco Dorigo (Université Libre de Bruxelles). It was made by his brother-in-law, who is a well-known sculptor in Italy.



# FACULTY SNAPSHOT

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





# GLOBAL IMPACT

ILLUSTRATION BY JONATHAN D. REINFURT

## TACKLING FINTECH PROJECTS ON WALL STREET—AND EVERYWHERE ELSE

While the majority of WPI's 50+ project centers around the world offer students a place to complete their Interactive Qualifying Project (IQP) work, there are several others that focus exclusively on the Major Qualifying Project (MQP) that students fulfill during their senior year.

One of them is the Wall Street/FinTech Project Center. A portmanteau of "financial technology," FinTech is a term used to describe new technology that improves the delivery and use of financial services for companies, business owners, and consumers. At first glance, it may seem as though FinTech's home should land primarily on Wall Street, but, really, it's applicable anywhere and everywhere.

"I like to say that FinTech is FinLife," says project center director **Robert Sarnie**, a professor of practice in The Business School who joined WPI after 23 years at Fidelity Investments. "It's in all areas and all companies to make finance frictionless. It's naturally interdisciplinary. It's not just about a balance sheet and income statement; that's just the tip of an iceberg that's growing fast."

A growing iceberg is an apt comparison—when Sarnie first took over the reins of the project center in 2019, it hosted nine students doing project work for three sponsors. Now he and Associate Teaching Professor in Computer Science **Wilson Wong** and Professor of Teaching in Mathematical Sciences **Marcel Blais** (both of whom also serve as advisors for computer science- and financial mathematics-centered projects at the project center, respectively) collaborate with 11 sponsors and host nearly 40 students in completing their MQP work. The project center also works regularly with the Mass FinTech Hub to curate and grow a robust FinTech network in Massachusetts.

The project center is run like a consulting company to deliver what the sponsor has in mind, everything from building an app and analyzing a customer base, to developing tracker systems and utilizing cloud computing. Sponsors are just as varied as the projects students work on, and include the likes of

State Street, Fidelity, Citizens, Fintech start-ups, WPI FAB Lab for Social Good, and even the Worcester Red Sox.

"This whole experience can help [the students] find jobs, get them pumped up, get them connected with what's going on in the industry," Sarnie explains. "It's all about getting the students where they want to go."

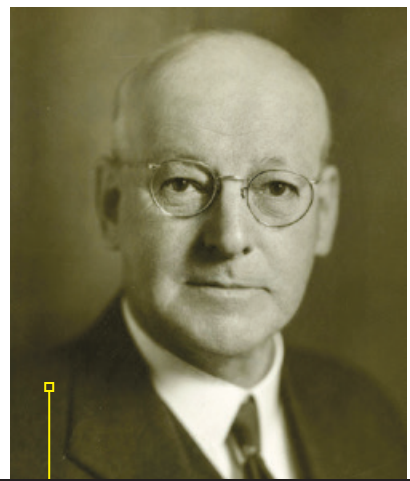
That sentiment is part of why **Renee Sawka '23** chose to complete her MQP at the Wall Street/FinTech Project Center. "I really valued the connection that the project center would create for me at top financial institutions," she says. Sawka and her team worked with State Street to develop a scalable automated testing framework that would provide constant feedback on the resilience of State Street's applications and services. Her favorite part of an especially busy term came at the team's final presentation, where the project sponsors and several others gathered to hear their findings.

"It was really nice to see them take so much interest in the work we had completed as well as future possibilities for it," she recalls. "I think that this experience was really rewarding, not only in the technical challenges we were able to tackle, but also the professional development that it offered us."

**Austin Zhou '23** agrees. While working to develop an automated error tracking system for Fidelity's assets and flows database, he and his teammates learned the ins and outs of navigating and communicating in financial services corporations, a prime example of the contributions and networking opportunities he'd hoped to achieve through his MQP experience. "There were times when our direct sponsor didn't have an answer for our questions, so we would reach out to other associates for advice ... my biggest takeaway was to be proactive about finding the right people," he explains. "Reaching out for help saved us a lot of time that we spent on working to fix the problem."

—Allison Racicot

PHOTOS FROM WPI ARCHIVES



### THE ARCHIVIST

#### A SPLASHY ADDITION TO CAMPUS

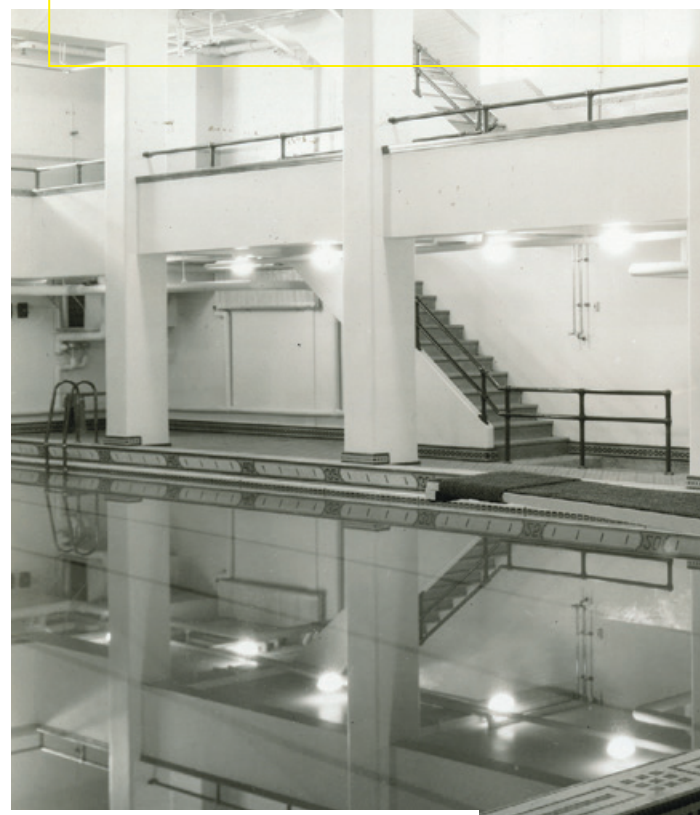
On Alumni Day in June 1926, **Henry J. Fuller, Class of 1895**, nervously stepped up onto the spring-mounted plank in the basement of Alumni Gymnasium at the invitation of President Ralph Earle. He steadied himself as he prepared to address the gathered crowd, balancing above the sparkling waters of Fuller Memorial Pool, the Institute's newest facility.

Fuller, who provided a gift of \$10,000 for the pool's construction, thought of his father, Homer T. Fuller, WPI's second president, for whom the facility was being dedicated that day. President Fuller oversaw a rapid expansion of campus, adding Salisbury and Alden Research Laboratories and implementing a four-year curriculum of study. This focus on academics, to the regret of father and son, meant that construction of recreation and leisure facilities were set aside for new laboratories and equipment.

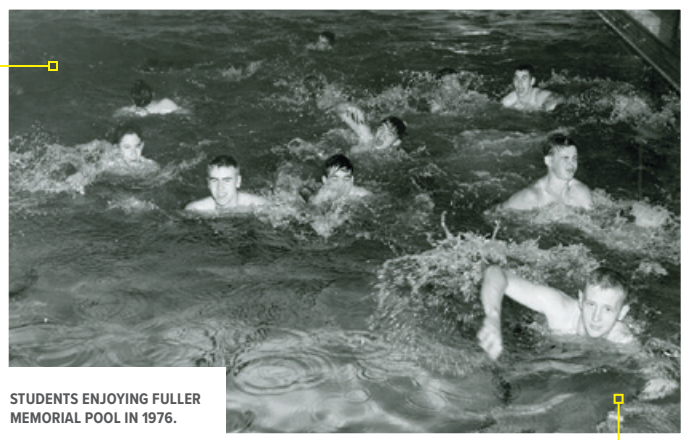
When Alumni Gymnasium was built in 1915, space had been reserved for a pool, and its delayed construction led to jokes among the students about returning as grandfathers for its dedication. But owing to the generosity of those same students and alumni, the campus community could finally enjoy swimming and diving indoors on campus.

The pool remained a popular feature on campus (until Alumni Gymnasium was closed in 2012), hosting athletic competitions and leisure days alike. Today, the WPI community can enjoy modern swimming and diving facilities in the Sports and Recreation Center, which also hosts training facilities for the crew teams. To learn more about the history of campus facilities, visit WPI Archives & Special Collections.

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



FULLER MEMORIAL POOL, PICTURED HERE IN 1926, THE YEAR IT WAS DEDICATED TO WPI'S FORMER PRESIDENT HOMER FULLER, WAS A POPULAR FACILITY ON CAMPUS UNTIL ALUMNI GYMNASIUM CLOSED IN 2012. STUDENTS AND ALUMNI, INCLUDING PRESIDENT FULLER'S SON, HENRY J. FULLER, ABOVE, PROVIDED MONEY FOR THE POOL'S CONSTRUCTION.



STUDENTS ENJOYING FULLER MEMORIAL POOL IN 1976.





**Rosanna Garcia**, Paul R. Beswick Professor of Innovation and Entrepreneurship, answers questions about the entrepreneurial culture of WPI.

**How does WPI encourage student innovation and entrepreneurship?**

Innovation is built into the curriculum with the Interactive Qualifying Projects and the Major Qualifying Projects. Entrepreneurship is encouraged through several programs that are broken into five stages: inspiration, exploration, foundation, application, and acceleration. The Innovation & Entrepreneurship Studio is for students in the inspiration and exploration stage when testing an idea. For the later stages, The Business School's Business Development Lab (BDL) at 50 Prescott St. is where a student can build a company around an idea. Students then develop their minimally viable product and over time scale their companies to a point where they're ready for an accelerator or incubator. Students preferring to 'test the waters' without starting a company can come to the BDL and be matched with another student's company.

**How do you get the word out about the many resources available to students who think they might have an innovative business idea?**

The Business School newsletter regularly announces various programs; there is more information at <https://www.wpi.edu/academics/business/business-development-lab>. Resources provided include office space, mentorship, along with introduction to banks, lawyers, accountants, and other professions and networking opportunities.

The Business Development Lab has a student ambassador program that will pay students to talk with their peers about the resources available for student startups. Interested students may reach out directly to me.

**Are you finding that students value social impact as much as potential profit?**

The BDL serves start-ups of all types—it's amazing how many have a social impact as part of their mission. Currently, all the student companies at the BDL have a social goal. Civil engineering major Nick Gronda runs CROI, which helps under-financed populations in paying for college. Cesar Guillen, a management engineering major, leads Universal Education, a company looking to provide education to low-income populations in developing countries that don't normally have the opportunity to attend college. Therapeutic Innovations, run by Assistant Professor Solomon Mensah, is dedicated to developing medical interventions for emerging economies focusing on neonatal health. He hopes that someday all children across the globe will have access to lifesaving and affordable medical technology.

**What is the most common misconception about business development that might keep students from pursuing a potential idea?**

I find the biggest misconception that students have is that WPI will automatically take partial ownership of their company if they operate from the Business Development Lab. The university takes no equity. If it feels there is intellectual property that needs to be protected, WPI often offers to pay for the provisional patent and then a licensing agreement may be made. If students want to pay for their own IP, the university does not take any future earnings. The services we provide at the BDL are available to any student at no cost. In fact, we have a small start-up stipend of \$500 that we give to each company joining the lab.

**What exciting ideas were honored at the Celebration of Entrepreneurship held this past spring?**

We honored more than 20 companies that had been involved with the BDL in the last academic year. Two companies "graduated" from the lab, which means they had outgrown our space, which is very exciting. Anthony Galgano '22 launched TRUE Robotics to develop a classroom robotics kit, curriculum, and training service to provide an affordable, hands-on, all-in-one STEM experience for students in grades six through eight. The purpose of the classroom package is to provide students and teachers access to the latest technology, to increase student interest in STEM, and to have students design, build, and program robots in a hands-on environment. Priscila Espinosa runs SproutChange, which provides consumer education around alternative medicine, organic agriculture, sustainability, and social/food justice. SproutChange seeks to empower everyday people to become autonomous with their overall health. Watching these companies grow using the resources of the BDL is such a pleasure!

**How can alumni get involved to encourage student entrepreneurs?**

We are actively recruiting mentors for our faculty start-ups. Translational research is when lab innovations are moved from the lab to the marketplace. Faculty are experts in their fields but they seek guidance on how to navigate market environments. We have several alumni who fulfill the roles of mentors and advisors. Our AMP! (Advisors, Mentors, and Partners!) program holds monthly events that match technology-based start-ups with mentors. Interested alumni may also reach out to me: [rgarciaphd@wpi.edu](mailto:rgarciaphd@wpi.edu).



## SHOOTING HIGH

A total of 1,088 undergraduates crossed the stage on Saturday, May 13, including at least one who has her eyes on the C-suite. Two days earlier at the graduate commencement ceremony, 784 master's degrees and a record 88 doctoral degrees were awarded. President Grace Wang applauded the graduates for their dedication, persistence, passion for their field of study, and achievements. "You have earned your place among generations of exceptional WPI alumni. I hope you will take the opportunity, as they did, to push boundaries, explore unknowns, and deliver a tangible and profound impact to the world."



PHOTO BY COLE PARKS '24

# SENSE OF PLACE





# Revealing the Ocean's Mysteries

UNDERWATER CINEMATOGRAPHER  
JONATHAN BIRD '90 TELLS THE STORY  
OF LIFE BELOW THE WAVES.

BY JULIA QUINN-SZCESUIL





**D**espite growing up less than a half-hour's drive from the Massachusetts coast, underwater cinematographer Jonathan Bird '90 was hardly a beach bum. "Before I got scuba certified, I can count on one hand the number of times I had been to the ocean," he says. But a love of photography, an annoying graduation requirement, and a fascination with documentarian Jacques Cousteau led him to a career he loves, one that spans expertise as a producer, director, editor, writer, and sometime actor.

Bird is co-founder and president of the ocean conservation nonprofit Oceanic Research Group and has a YouTube series, called *Blue World*, three IMAX films, membership in the International Scuba Diving Hall of Fame, and a deep commitment to ocean conservation. It's no surprise that Bird's childhood idol was Cousteau, who hosted *The Undersea World of Jacques Cousteau* from 1966 to 1976.

Cousteau's lofty status was based on Bird's appreciation for the oceanographer's seemingly exotic work. "I didn't grow up thinking regular people could become scuba divers," Bird says. "I thought scuba divers were superheroes. *Blue World* is my homage to Jacques Cousteau. The idea is to be educational yet adventurous, which is what I think Jacques Cousteau's show was about."

**“If you want people to care about something, you have to get them to love it.”**

#### A LIFE-CHANGING COURSE

Despite his fascination with Cousteau's program, Bird's own ocean-based career bloomed from one improbable WPI requirement—physical education. Given the academic rigor facing him as a WPI student, that PE credit irritated Bird. "I remember making a big stink about it with my friends," he says. "I'd say, 'Why do we have to take gym? You know, we're in college.'" His early PE credits lived up to his admittedly low expectations. A badminton class ran him ragged; an unflattering softball showing followed. But then the scuba diving option caught his attention. "I could get scuba certified and get that credit," he says. "And it's a good thing we had that gym credit requirement because it changed the course of my life."

Before long, Bird was heading to the coast to dive regularly. He became president of the WPI Scuba Club, and he began to merge his lifelong passion for being behind a camera to his newfound discovery of the underwater world. "To this day, as much as I enjoy scuba diving, if you take my camera away, I might just drink on the beach," he says, laughing. "Without the camera, I kind of lose the point."

It was neither photography nor scuba diving that landed Bird at WPI in the first place. "I was interested in a number of things when I was in high school," he says. "But I was really fascinated with high-end audio and the whole process of reproducing music in a good way."

As a self-professed audio nerd, Bird's dream was to run a company that made high-end speakers, so an electrical engineering major was a logical next step. A friend went to WPI so that put the university somewhere on his radar, but just barely. A rainy, cold campus tour underwhelmed him, but a later sun-drenched Accepted Students Day presented a whole new feeling and cemented his choice. "It was the most beautiful campus I had ever seen," he says.

Even with his newfound scuba diving affinity, Bird didn't jump into his current career right away. He put his ECE degree to work as an RF design engineer at Raytheon for a couple of years, with work on the Patriot defensive missile system used to save lives during the Gulf War as one of his most memorable projects.

But the call of the sea was impossible to ignore. "I wanted to see if I could make a career out of what I was interested in before I got too com-

fortable," he recalls. "I saw a lot of people who stayed a little too long and got a little too cushy. They had a family, a mortgage, and were locked into it. They were past the point where they could pursue their dreams. I said to myself, 'I am going to become like that if I don't do it fast.'"

During his off time, Bird and fellow Raytheon colleague and dive buddy Tom Krasuski '92 began giving educational presentations about conservation and ocean health in local science classes, finding a style that blended education and entertainment—a style Bird uses to this day. Those forays into classrooms guided his next steps. Echoing the wisdom of Cousteau ("If you want people to care about something, you have to get them to love it."), Bird decided to change his course of action. He earned an MS in ocean engineering with a focus on marine biology at

the University of New Hampshire (with a full tuition scholarship) and decided to take a dive into the unknown.

#### SPREADING THE WORD ABOUT THE OCEAN

With an unwavering commitment to the ocean, Bird is dedicated to getting people to love the creatures in it so they will be more inclined to protect them and the waters they live in. Using underwater cinematography offers a way to observe closely and show the real, often remarkable interactions between the animals or between animals and humans.

"You're in another whole world when you're diving," Bird says. "You can approach marine life closer than anything on land. In the ocean, animals are curious and will come over to you. People who dive have a greater appreciation for the ocean and the animals in the ocean and become the strongest advocates for ocean conservation."

While he's come to realize that scuba divers aren't actually superheroes, they're a pretty special group of people. "Once you dive, you are in a kind of club," he says, noting that newcomers are welcome. "The best thing is that anyone can be in this club."

Bird is aware he holds a special responsibility to share information in a way that captivates an audience. "Because *Blue World* is my passion and filmmaking is my thing, telling a good story is important," he says. Rare animals or unusual sights aren't what drive the filming locations. "I think, 'Where can I go where I can tell a good story?' You always want to bring something fresh to the table."



And he has. Bird currently has three IMAX movies playing across the country. Locally, *Ancient Caves* is enjoying a run of already more than 18 months at the Museum of Science, while *Secrets of the Sea 3D* just opened at the New England Aquarium. It was made in collaboration with the renowned filmmaking team of Howard and Michele Hall, Bird's longtime professional inspirators who have become collaborators and friends. In fact, the Halls' 1992 documentary *Shadows in a Desert Sea* played a pivotal role in Bird's current career. "That was the film that made me want to be a filmmaker," he says. Upcoming projects include filming in the Bahamas with wild spotted dolphins, and then filming at the Tennessee Aquarium for a *Blue World* shoot and a *Secrets of the Sea* premiere at its IMAX theater.

#### OCEAN CONSERVATION

Through his work, Bird consistently shows the ocean as a home. "There are so many people, companies, nations that treat the ocean both as an endless resource and as a dumping ground," he says. "People who dive understand that. I've been diving long enough to see the changes in the ocean, and it's depressing what's going on." Warming ocean temperatures have vastly changed the types and amounts of marine life he sees in, for example, the Gulf of Maine.

And overfishing is a problem that people might hear about, but Bird sees its direct impact. "We used to see so much more marine life than we do now," he says. "I haven't seen a cod in a decade." As marine life shifts habitats, it changes everything about the delicate ecosystem as the dynamics of species are altered.

Bird's beliefs change how he lives his own life, although he's cautious about how he shares his opinions. He might joke that he won't eat seafood out of professional courtesy, but the reality is he cannot in good conscience eat what he considers a finite and rapidly disappearing food source. "Eight billion people can't survive on wildlife," he says. "Unlike ranches that raise animals for food, fishing doesn't work that way. People are turned off by being hit over the head with conservationism. So all you have to do is show them what's happening on this reef—show them these amazing behaviors and they will like the animals and think they are cool. And they will care about them."

It's easy for Bird to love marine life. With more than 5,000 dives under his belt, encompassing every continent, he has seen all manner of marine interactions and behaviors. Swimming with whales, dolphins, sharks, and manta rays is especially awe-inspiring, given the size of the animals and the intelligence they show. "There's a lot going on in their heads that you aren't realizing," he says. Dolphins and seals are especially known to investigate and even play with humans in the ocean. Bird recalls one afternoon dive spent with a manta ray that stayed with him for hours, returning after Bird took periodic breaks out of the water and even

hanging close to the surface when the scuba tanks were depleted and Bird changed to snorkeling. "I think she was bored—and, obviously, very intelligent," he says.

Although he feels like he could have an honorary marine biology degree by now, Bird's expertise is gained from the extensive observation and interaction that most people don't have, like how he knows hammerhead sharks are "the most scaredy-cat of all the sharks" or the way he describes being a sucker for cephalopods. "I like a good octopus encounter," he quips.

Peaceful as it may seem, the ocean has perils. Bird recalls a heart-stopping moment while filming sperm whales with his wife, Christine. The 35-foot creature came up to them, and as Christine was filming, she moved in closer just as the whale shifted and brought its fluke up to dive. Bird recalls seeing Christine pulled to within inches of the whale's powerful tail. Incredibly, the massive animal sensed her, stopped, flipped upside down to get a closer look at this human interloper, and gently maneuvered so as not to touch her. "This is an animal so incredibly aware of its surroundings," says Bird, "and so gentle. Unless you're a giant squid, and then you're dinner!"

#### AN UNLIKELY CAREER

Looking back, Bird considers his forethought in shaping a career and life that suits him so well. "I don't know what even possessed me," he says. "I think I just figured out this philosophy early in life that I didn't want to be in a cubicle doing something I didn't really like. I wanted to be out doing something I really liked. The luckiest thing is that I found it. And it's a lot easier to go for it when you're younger."

Bird says he's grateful to his wife (they met through the New England Aquarium Diving Club) who was able to support his career while managing her own career and their family life. As he was often away for one week during most months of the year, she was the primary caregiver for their two children (a son, now 16, and a daughter, now 19). But the flexibility offered on his weeks at home is something Bird cherishes. "I could be there to bring them to the bus," he says, and he treasures those family memories.

Years removed from his student days, Bird still holds close the friendships and the knowledge he gained at WPI. Over his WPI years, he expanded his circle of friends by participating in the photography club and working audio equipment for Lens and Lights. He was also a devoted member of *The Project* and *Twelve Mile Limit*, bands that specialized in music best described as "obscure progressive rock—nothing that anyone generally wanted to listen to," says Bird, that played in steady rotation at vintage Worcester hotspots like Gompei's Place, Ralph's Diner, and McGillicuddy's.

From working with his favorite professor, Russell Krackhardt '48 MS



**“There are so many people, companies, nations that treat the ocean both as an endless resource and as a dumping ground.”**

(“the greatest professor I ever had”), who retired the year Bird graduated, to building resilience in the face of failing physics, Bird says the lessons were there for the taking. “I was that kid in high school that got straight A’s without even trying,” he says. “When I got to WPI, I was the stupidest kid they let in that year. I realized you can’t approach WPI the way you approach high school. I had to learn how to study.”

But learning how to study didn't come easily and one night frustration got the better of him. Opening his window to yell out, “Help! I need help with EE2001!,” Bird never expected an answer. But John Mansolillo's voice floated back from across the street, “What’s the problem?” Mansolillo, a year ahead of Bird, came over and offered his mesh analysis knowledge until Bird grasped the concept—and a lifelong friendship began. “I really didn't know the guy,” says Bird, laughing. “But he came right over and walked me through it. A lightbulb went on, and he said, ‘My work here is done,’ and left. He’s one of my best friends in the world.”

Bird says people ask him frequently what good an engineering degree is for an underwater cinematographer. “It’s amazing because engineering teaches you that you can do anything,” he says. “You can solve whatever problem you come up with. Anytime I am presented with a challenge, I think, ‘How do I build something that fixes that?’ whether it’s a tool, camera housing, or a piece of lighting equipment. We are constantly building gear for our productions.” Bird thanks his engineering education for the way he approaches a problem. “It’s that thought process,” he says. “When you are presented with an obstacle, one simply engineers a way around it. Engineering is a really great background for just about anything.”

Bird is grateful that he took a leap of faith all those years ago to pursue a career path that provided him with meaning and that has a broad effect on the world. “I am incredibly lucky that I get to do what I love for a living,” he says. “I never forget that.”





A clear glass filled with water, showing numerous bubbles rising from the bottom. The words "NOTHING LASTS FOREVER" are printed on the glass in a light, sans-serif font, partially submerged in the water. The background is a plain, light color.

NOTHING  
LASTS  
FOREVER

Julie Bliss Mullen '12 uses electrochemistry to sever the nearly unbreakable bond in PFAS forever chemicals.

BY AMY CRAWFORD  
PHOTOGRAPHY BY JOHN GILLOOLY



RO CONCENTRATE

**P**er- and polyfluoroalkyl substances, more concisely known as PFAS, are a group of some 14,000 synthetic chemicals that include a chain of carbon and fluorine atoms with a bond that is nearly unbreakable. First patented in the 1930s, they have had a wide variety of uses, including in adhesives, concrete, detergents, cosmetics, automotive finishes, electronics, ammunition, medical devices, firefighting foam, and even violin strings. The original formulation of Teflon, which still coats nonstick cookware in kitchens around the world, was based on PFAS, as was the original version of the blockbuster stain repellent Scotchgard.

This nearly unbreakable bond is what makes PFAS useful in such a wide variety of applications—but it's also why these chemicals are a slow-brewing environmental disaster.

By the 1990s, accumulating evidence showed that exposure to PFAS poses health risks, including cancer, immune system disruption, and developmental issues in children. In 2001, the U.S. Environmental Protection Agency (EPA) published a health advisory for two common types of PFAS, perfluorooctanoic acid and perfluorooctane sulfonate. Although over the next two decades many manufacturers phased out the use of PFAS, the chemicals have persisted in the environment, where they continue to pose a danger to people and wildlife. They don't biodegrade, they aren't broken down by solvents or sunlight, and they can remain in our bodies for years—in short, they seem to live up to their common nickname, “forever chemicals.”

But nothing really lasts forever. And that's what **Julie Bliss Mullen '12**, the driven founder of a start-up called Aclarity, is aiming to prove.

#### A SAFE DRINKING WATER OBSESSION

Mullen first started thinking about PFAS the summer after her sophomore year at WPI, when the dual environmental engineering and environmental and sustainability studies major began an internship with the Boston office of the EPA, focusing on drinking water safety.

“At that time, PFAS were considered a ‘contaminant of emerging concern,’ in drinking water,” Mullen says. “There was still not a lot known, but we all knew that these were forever chemicals, that they don't degrade, and standard treatment technologies don't do anything to destroy them. Even something as complex as UV and ozone and some of the more advanced treatment technologies didn't touch them.”

Until recently, the only way to deal with PFAS in drinking water was to absorb it with activated carbon or ion exchange resins, resulting in solid, PFAS-encrusted chunks that had to be disposed of in a landfill. There, however, the chemicals continue to cause harm by seeping out with leachate, a rather evocative term-of-art for the rainwater that percolates through a landfill, absorbing pollutants before draining into the environment.

“That leachate comes out, it's discharged right into the sewer or the

river, it goes into the oceans, it gets into the groundwater, and now you have this massive problem,” says Mullen, who would gradually become obsessed with safe water as she continued her education.

With WPI's chapter of Engineers Without Borders, Mullen traveled to Guatemala, where her team developed rooftop water-harvesting systems for a rural community that had previously relied on a single, seasonal well. She devoted her MQP to researching PFAS, and after graduation she returned to the EPA as an environmental engineer while taking graduate classes at WPI. A National Science Foundation Graduate Research Fellowship allowed her to begin working toward a PhD in civil and environmental engineering at the University of Massachusetts Amherst, and it was there that she discovered a promising solution that would change the course of her career.

At UMass, Mullen was focusing on electrochemical oxidation, researching different types of electrodes as she investigated the technology's potential to remove contaminants from water. She developed a water treatment system that sent a current through water, and she hoped it might work as a commercial product for use in homes. With the encouragement of her advisors and the entrepreneurship office at UMass, she filed a patent.

“We thought, and now we have confirmed, that we had found something that no other researcher or anybody else had found before,” Mullen says. “The technology generates oxidants, essentially really strong chemicals that break down compounds. I was originally thinking this would be for bacteria and viruses, but this was producing really strong oxidants, the kind that can break down things like volatile organic compounds, pharmaceuticals, and pesticides—and some of the other so-called ‘contaminants of emerging concern’—all the stuff that I was working on when I was at the EPA.”

She suspected the technology would also prove a powerful weapon against PFAS, and as she continued to work on the tech, Mullen began to consider what to do with it. She was on track for a successful career in academia, but she also craved the satisfaction of having an immediate impact on a real-world problem. A lifetime in the lab seemed unlikely to offer that.

A start-up, on the other hand, might.

#### TAKING THE LEAP

Mullen grew up in a working-class family in Uxbridge, Mass., 20 minutes and a world away from WPI. Her father is an auto mechanic and her mother is a waitress. She was encouraged to explore the world and pursue higher education as the first in her family to go to college, let alone pursue a PhD. In high school, she had been active on the student council, the environmental science club, and the dance team, and when it came time to apply to college, her primary ambition was to find a likeminded







“I THINK RESEARCH IS REALLY IMPORTANT BECAUSE IT DRIVES SOLUTIONS. BUT I KNEW I DIDN’T WANT TO BE AT THE BENCH ALL THE TIME. I WANTED TO TAKE SOMETHING INNOVATIVE AND DO SOMETHING MEANINGFUL WITH IT.”

successful she is! But I really can’t remember her not being confident. She didn’t hesitate to make pitches when she was eight months pregnant. This is the reality of entrepreneurs today, and she did it with gusto.”

#### THE CHALLENGES OF A START-UP

In the years since she founded Aclarity, Mullen, who holds the title of CEO, has built a team of about a dozen full-time employees, including several WPI alumni. Employees are required to have not only strong technical skills, she says, but also “the internal drive to solve really big problems. We’re a start-up, and with that there are new challenges every day, so we all step in and help each other out.”

Crucially, Aclarity has demonstrated to the market that it can indeed sever the nearly unbreakable carbon-fluorine bond that gives “forever chemicals” their name at full-scale. It now has more than 30 clients, including manufacturers, water engineering firms, and landfills. Aclarity’s system can eliminate PFAS in concentrations as low as a few parts per trillion, but because treating a concentrated waste stream is the most efficient way to address PFAS, the team often finds itself dealing with leachate, a thoroughly disgusting substance that, Mullen says, looks and smells like the filthy water that might accumulate in the bottom of a dumpster – but much worse.

“From an environmental impact standpoint, though, it’s so important, because about 50 percent of PFAS in the environment is in landfills, and 28% of that comes out in the leachate,” Mullen says. “We’re actually removing that forever from the environment, breaking the PFAS cycle.”

The first step in tackling a new source of PFAS contamination involves deploying an Aclarity mobile trailer, with a pump, power supply, myriad pipes and valves, and a single full-scale reactor. (The reactor is about the size of a water cooler; permanent installations include a set of eight.) Inside the trailer is a mobile laboratory with a touchscreen monitor that allows Aclarity to track amperage, voltage, pressure, temperature, and flow rate, which is typically between one-half and two gallons per minute.

“Basically, leachate goes into storage tanks and then we pull up our trailer and plug the hose right into a tank and pump the water through the reactor,” Mullen explains. “We pump it through, the PFAS is destroyed, and then we pump it right out into another tank. The data from the pilot helps us see what the permanent, full-scale system is going to look like for that site. And it’s really cool when you’re on site and you see this raw leachate go through, then come out – and it’s a lot cleaner. You can see it has much more of a yellow-to-clear tint to it, as opposed to this dark black color.”

The company now has clients across Massachusetts and as far away as

Virginia and New Mexico. Mullen still visits every site, suiting up in a hard-hat, safety vest, boots, and safety glasses to walk her clients through Aclarity’s process. At least half her time recently has been devoted to pitching investors across the United States and around the world. In June the company closed on a Series A venture capital fundraising round. That better positioned Aclarity to take advantage of the expanding PFAS destruction market, which was valued by BlueTech Research at close to \$4 billion.

“The investors that are coming in this round are from all around the globe,” she notes.

Mullen is married to a fellow WPI alum, Daniel Mullen, with whom she has a toddler and a preschooler. When not on the road, she often works from home, which allows her to combine busy work days and late nights with family time.

“We have two or three solid hours with our kids every day, and we try to make that time really count, but it’s definitely hard to not be with them as often as I feel like we should be,” she says, noting that it can be especially difficult when she has to travel. To make it more fun for the kids, Mullen always takes one of their stuffed animals with her on business trips, snapping photos to send back home so they can see the adventures their animal friend is having.

Balancing things can be hectic, but Mullen’s children are also an important reminder of why she works hard to rid the world of PFAS, chemicals that threaten the health of children everywhere, and of the environment they stand to inherit.

“Being away from them is always tough, but I do have to remember what I’m doing,” she says. “We have made this technology economic and deployed it in the field, and we’re leading the way to permanently destroy PFAS – forever! Someday, my kids will be old enough to understand what that means for all of us.”

community: people who were passionate, studious, and engaged, and who wanted to make an impact in the world.

Entrepreneurship, on the other hand, was an idea that came later – surprising even Mullen herself as she considered her future post-WPI.

“I think research is really important because it drives solutions,” she says. “But I knew I didn’t want to be at the bench all the time. I wanted to take something innovative and do something meaningful with it.”

Half a decade later, she had her innovation. The next step would be more of a leap.

“For a while, I was afraid to talk about starting a company even with my classmates at UMass, because I thought that people would just think that I wasn’t focusing on my PhD,” Mullen says. “There can be a stigma even for filing a patent, because a patent doesn’t actually count toward your PhD.”

But despite her own hesitation, and the fact that it would make publishing her research more difficult, her advisor, David Reckhow, urged her to pursue commercialization. She started by taking a business course in “customer discovery,” which gave her confidence that there was a market for electrochemical water purification. Then, in 2017, she participated in a campus-wide pitch challenge. She won first place, with a prize of \$26,000.

“That, at the time, was huge,” she says, “because now I had the opportunity to build something and really test it out and take it to trade shows and potential customers. After I won that prize, I formally incorporated the company.”

Soon afterward, Mullen decided to leave her PhD program and focus full-time on building the business she had named “Aclarity,” pitching it to investors, perfecting the tech, and assembling a talented team.

“She was focused, and she knew – that always impressed me – what she could offer to the industry,” says WPI trustee Judy Nitsch ’75, Hon. ’15, who was paired with Mullen through the Trustee Mentor Program in 2011 and has remained a confidant. Nitsch started her own business, Boston-based Nitsch Engineering, Inc., in 1989, at a time when women founders were rare, and grew it into a nationally recognized, 110-person firm before she retired in 2020. While she wasn’t familiar with Mullen’s specific field, Nitsch was a ready source of business advice, encouraging Mullen as she pursued her dream of starting a viable company.

“She was doing a lot of pitches, so I did talk with her about how to present yourself, to have answers to potential questions already prepared,” Nitsch remembers. “And obviously she has done that, because look at how







BY KRISTEN O'REILLY

ILLUSTRATION BY PEPE SERRA

# REVOLUTIONARY TECH

OR  
PANDORA'S  
BOX

WPI experts weigh in on what should excite and alarm us about ChatGPT.

**W**hen you hear both exciting promises and dire warnings about ChatGPT and other large-language models, the dichotomy can be confusing.

Is ChatGPT groundbreaking technology as revolutionary as the steam engine or electricity that allows machines to efficiently handle tedious, mindless work, opening new horizons for untethered human creativity? Or does it create a sly trap, tricking and manipulating the uninformed, marching humanity toward self-aware technology that will inevitably take over the world, à la HAL 9000 from the 1968 film *2001: A Space Odyssey*?

In short, is it a tool to be embraced—disruptive in a good way—or something to be feared as a Pandora's Box that, once fully opened, poses “a profound risk to society and humanity,” as an open letter signed by more than 1,000 tech industry experts and academics warned in early 2023?

Five WPI experts weigh in on the current and future impact of ChatGPT—in society in general and in the classroom in particular—as the world adjusts to this new landscape.

## CHATGPT EXPLAINED BY CHATGPT

ChatGPT is a large-language model that was trained by OpenAI. It is based on the GPT (Generative Pre-trained Transformer) architecture, specifically the GPT-3.5 model, which is an improved version of the GPT-3 model.

The purpose of ChatGPT is to generate human-like text responses to user input. It does this by using a process called unsupervised learning, where it analyzes vast amounts of text data to learn patterns and relationships between words and phrases. This allows it to generate coherent and contextually appropriate responses to a wide range of queries.

ChatGPT can be used for a variety of purposes, including chatbots, question-answering systems, language translation, and more. It has a vast knowledge base and can understand and respond to queries on a wide range of topics.

Overall, ChatGPT represents a significant advancement in natural language processing and has the potential to revolutionize the way we interact with computers and artificial intelligence.

*Text generated by ChatGPT in response to the prompt: "Explain ChatGPT."*



# FIRST, RECOGNIZE CHATGPT FOR WHAT IT IS—AND ISN'T.

Experts agree that taking the mystery out of this emerging technology is the first step to understanding it. While the most talked-about version of large-language models might be ChatGPT, which made a splash when OpenAI launched it in November 2022, other options such as Microsoft's Bing, Google's Bard, and Meta's LLaMa are gaining traction, with more sprouting up seemingly overnight.

"There's no magic to ChatGPT," says **Xiaozhong Liu**, associate professor of computer science, whose research focuses on natural language processing and content generation. "It's an AI model that predicts the next word, given the context and known interactions, using a super large database—in the case of ChatGPT3—of 200 billion parameters. ChatGPT can't understand semantics within words. However, it can generate words in a very beautiful way."

Unmistakable benefits include the ability to summarize information for efficient decision making or to order a series of facts into a reasonable-looking narrative. "For instance, if you go to Amazon and read reviews, there might be 1,000 of them and you won't have time to read them all," says Liu. "We can use an algorithm to summarize those reviews to help you make a decision. Commercially, ChatGPT is really promising."

The dark side involves the limitations of the training databases ChatGPT uses, with potential bias purposefully or mistakenly swept in, and the ethical issues that arise when the potentially flawed narrative is presented as fact, sometimes with results so far off the rails they're called hallucinations.

"If you asked a ChatGPT to solve an algorithmic problem similar to what it was trained on, it can often give you a correct answer or something that's convincing, even if it's wrong. In contrast, if you ask it something completely outside of what it's been trained on, it will give you convincing-sounding, utter nonsense," says **Jacob Whitehill**, associate professor of computer science. "It's dangerous because if you don't have the metacognitive awareness about how to be skeptical and how to drill down to make sure you're not believing the wrong parts, it can really lead you astray."

**Gillian Smith**, associate professor of computer science and director of the Interactive Media and Game Development program, says human nature's tendency to read intelligence into non-intelligent technology only compounds the problem.

"AI is not sentient. It's software created by humans, embedded with human biases, designed in an intentional way," says Smith. "When we start to think of software as having agency, we give it a dangerous level of power. Some people interact with ChatGPT in the same way they talk with a person, and that imagined person feels like an authority. But it's not a person, it's not an authority, and it's not intelligent."

And left to its own devices, large-language models may get worse before they get better, says **Kenny Ching**, an economist and assistant professor in The Business School.

"So much goes on in a black box. I consider myself fairly learned, but I don't understand these models and what data they are pulling from," Ching says. "ChatGPT is the one we're talking about now. But within a year, we'll have thousands available—all using their own databases and biases. We don't know where the errors can be."



XIAOZHONG LIU, ASSOCIATE PROFESSOR OF COMPUTER SCIENCE

**"CHATGPT CAN'T UNDERSTAND SEMANTICS WITHIN WORDS. HOWEVER, IT CAN GENERATE WORDS IN A VERY BEAUTIFUL WAY."**



JACOB WHITEHILL, ASSOCIATE PROFESSOR OF COMPUTER SCIENCE

**"IF YOU ASK IT SOMETHING COMPLETELY OUTSIDE OF WHAT IT'S BEEN TRAINED ON, IT WILL GIVE YOU CONVINCING-SOUNDING, UTTER NONSENSE."**

## ETHICAL DILEMMAS ABOUND AND GUARDRAILS ARE SLOW TO EMERGE.

A mayor in Australia threatens to sue OpenAI for defamation unless it corrects a false claim by ChatGPT that he served prison time for bribery. A George Washington University professor objects because he is wrongly included on a ChatGPT-generated list of legal scholars who have been accused of sexual harassment. Artists who post their portfolios online have their work unknowingly swept up into AI text-to-image generators without consent or compensation. Private health

information or other personal data may be collected—through legal or illegal means—and used nefariously. Ethical issues are breaking new ground in a legal system not prepared for this new technology.

This past D-Term, Smith introduced a special topics seminar called "Ethics of Creative AI" that filled up so fast she had to expand the course's capacity—from 12 to 42—over the course of a week. Students chose individual topics to research and discuss, such as how ChatGPT easily generates propaganda or the consequences of questionable data that introduces gender bias, racial stereotypes, or hateful speech into the results.

The impact is great in the creative world, where AI can take the talents of artists, songwriters, even choreographers, to manufacture similar works that easily circumvent copyright protection.

"It's one thing to be creatively inspired by another artist, or even to sample—music especially has a really strong tradition of sampling. But it's always an intentional, attributed nod to the artist. Now there's no affirmative consent process," says Smith.

At a U.S. Senate hearing in May 2023, OpenAI CEO Sam Altman acknowledged the need for some kind of government regulation, suggesting a federal licensing agency to oversee new liability rules or safety requirements. But the wheels of government turn slowly and no such oversight plan is on the horizon.

In the meantime, other countries such as China are creating strong regulations on their training models that reflect certain political beliefs, says Liu.

"Right now, ChatGPT provides a centralized service from Microsoft, which is good," he says. "In the very near future, ChatGPT will be decentralized and there will be lots of other choices. In the U.S., I wouldn't be surprised if we soon see a liberal ChatGPT or a conservative ChatGPT. You will find the bubble that supports your viewpoint. People will have fewer and fewer chances to learn something comprehensively."



GILLIAN SMITH, ASSOCIATE PROFESSOR OF COMPUTER SCIENCE AND DIRECTOR OF THE INTERACTIVE MEDIA AND GAME DEVELOPMENT PROGRAM

**"AI IS NOT SENTIENT. IT'S SOFTWARE CREATED BY HUMANS, EMBEDDED WITH HUMAN BIASES, DESIGNED IN AN INTENTIONAL WAY."**



KENNY CHING, ECONOMIST AND ASSISTANT PROFESSOR IN THE BUSINESS SCHOOL

**"I DO KNOW THAT IF WE BAN THE USE OF CHATGPT FROM A COLLEGE CAMPUS, STUDENTS WILL FEEL THE EXPERIENCE THEY GET HERE WILL BE MORE DISPLACED WHEN THEY GO OUT IN THE WORLD OF BUSINESS."**

**DESPITE THE DANGERS, CHATGPT IS A GAME CHANGER FOR DEVELOPING COUNTRIES.**

While the developed world wrestles with issues of privacy and accuracy of large-language models, the benefits outweigh the risks in countries struggling with access to higher-level education and healthcare, according to Xiaozhong Liu.

"Under-resourced countries need three things: food, education, and medical care. ChatGPT can help with the last two. It opens the door to a personalized delivery of knowledge that they really need," he says. He can record a lecture on a topic, but if the viewer doesn't speak the same language or have the same educational foundation, the effectiveness suffers. ChatGPT can break down concepts based on the background and knowledge of the audience.

In terms of healthcare, in countries where there might be one doctor per 20,000 people, "privacy and ethics of AI are luxury words," he says. "If my kid is dying, and someone told me that they won't provide me help 'because it will violate your privacy,' that's a misleading concept. ChatGPT can provide basic knowledge and critical resources to save lives."

PORTRAITS CREATED WITH ADOBE PHOTOSHOP NEURAL FILTERS



## EDUCATORS ENCOUNTER CHALLENGES—AND **OPPORTUNITIES.**

ChatGPT's ability to generate intelligent-sounding prose has caused waves of concern across all levels of education. Faculty are reevaluating assessment techniques and establishing ground rules for disclosing AI's use, but also embracing opportunities to help students use the tool critically, especially since they will probably be using large-language models after they graduate.

"One of the benefits of ChatGPT is that it has exposed a shaky foundation of what a lot of modern education has been built upon, which is regurgitation rather than real inquiry," says Kenny Ching. "This wasn't always the case. Not too long ago, research was an essential part of the educational system, even at the undergraduate level. Since then, teaching and research have become so delineated that they became two activities altogether. Our graduates need to be knowledge producers—and WPI's educational philosophy of theory and practice fits this well."

"It's my job as a professor to design take-home assignments to help students practice skills above and beyond what they can get from ChatGPT for free," says Jacob Whitehill. "Children still have to know how to add and subtract numbers despite having calculators. It's still important for students to learn the basic skills so they can achieve higher-level knowledge building."

Some believe AI itself can uncover ChatGPT-generated text—becoming the solution to the problem it creates—but more sophisticated iterations may make that detection harder. Instead, our faculty experts agree, educators should teach students how to coexist with the tool and learn from it.

"Our students actually do struggle with how to use AI," says Yunus Telliell, assistant professor of anthropology and rhetoric. In his Introduction to Rhetoric class, he asks students to create assignments with ChatGPT and then critically analyze the output, comparing it to text humans have generated. He thinks cultivating such metacognitive skills as part of a community of learners is what makes universities special and exciting places in the age of AI.

And he is convinced that ChatGPT shows obvious limitations, especially with writing and thinking.

"If we really want to differentiate human writing from AI text, we need to think about the process—writing is about making mistakes and learning from those mistakes. This is certainly a manifestation of our limitations: our short memories, our attention spans, our desires, our obsessions," says Telliell. "That's not necessarily a bad thing. We connect to each other through these limitations and vulnerabilities. If human writing is special, it's because it is not perfect. This 'imperfection' allows new horizons to emerge in our thinking. To me, that's the past of humanity—and will be its future."

Rather than police the use of the technology, Ching says he assumes AI will be used by students, which allows him to dive into higher-level concepts. For instance, in his sports analytics class, he now skips over foundational coding prerequisites. "I'm making the assumption that students will level up quicker in terms of the coding knowledge needed to do this analysis. You can get AI to do that."

Long before ChatGPT became popular, progressive faculty were embracing "ungrading," a concept that emphasizes feedback rather than scores or letter grades for better learning outcomes, says Smith, which should make AI-generated output irrelevant.

"Homework shouldn't be about getting the right answer. Professors should be giving students room to make mistakes on assignments in a way they are not implicitly punished for, and also for students to see it as a place to make mistakes instead of completing assignments based on a rubric," she says.

"The bigger question is, 'What is the meaning of higher education?'" says Telliell, who with Professor Robert Krueger represents WPI in the nationwide Public Interest Technology University Network. "What we should be teaching is how to work with a community, learn for the good of society, and create technologies that help us and others flourish. Like many colleagues at WPI, I work to be a better educator and scholar by building on conversations and the understanding that we exist in a bigger place," he says, adding that none of these essential concepts can be taught or assessed by ChatGPT.

**"IF WE REALLY WANT TO DIFFERENTIATE HUMAN WRITING FROM AI TEXT, WE NEED TO THINK ABOUT THE PROCESS."**



YUNUS TELLIEL, ASSISTANT PROFESSOR OF ANTHROPOLOGY AND RHETORIC

## IGNORE, OR DISCOUNT, AT YOUR OWN PERIL.

Although some have called to somehow ban, or at least pause, the further development of large-language AI models until the implications are better understood, the reality is that students will be using the technology in many professions after they graduate.

"I do know that if we ban the use of ChatGPT from a college campus, students will feel the experience they get here will be more displaced when they go out in the world of business," says Kenny Ching. "It's on the educator to find a way of integrating the tools. If we say you can't use it now, and you're going to use it in the future, are we shooting ourselves in the foot?"

He says with any general-purpose technology such as the steam engine or the computer, jobs are inevitably affected—some more than others. "If we look at the pushback, it's really been loud from people who think their jobs are directly being threatened," he says, adding that rather than the blue-collar jobs that were replaced with earlier technologies, the jobs that AI might do more efficiently are white-collar ones such as a data analyst. On the other hand, "coders recognize it may take away the tedium of their job, but not the creativity."

"Let's think of AI as just a decision tool, and specifically a decision tool to lower the cost of making decisions," he says. "The corollary is that the value that you as a human add to the decision just got a lot higher."

### The speed of recent developments seems alarming—but is it?

"The development seems to be happening fast in the public sphere, but these tools have been a long time coming," says Gillian Smith, whose dissertation a decade ago focused on the implications of generative AI. "It's gotten more attention now because anyone can use it—you don't have to install a software package, it's being integrated into Microsoft Office products, and the output is getting better and more believable than prior iterations. But the fundamental underlying tech has been around for a long time."

Smith is optimistic that, as in all emerging technologies, boundaries will eventually be discovered that will show ChatGPT's obvious limitations.

**"MY WORRY IS THAT THE BOUNDARIES ARE SO FAR AWAY THAT IT MIGHT TAKE US TOO LONG TO FIND THEM," SHE SAYS. "IN THE MEANTIME, IT'S BELIEVABLE ENOUGH THAT WE'LL LET OURSELVES KEEP GETTING TRICKED."**







“WPI has had a great deal to do with my success. Not only did the academics prepare me well as an engineer, but playing football taught me life skills, both on and off the field. My wife, Sharon, and I felt it was important to pay it forward, which is why we support the athletics program and scholarships at WPI.”

—TRENT GERMANO '71

Trent Germano understands the importance of a team. As co-founder and principal of the investment and development firm Mariner Group, Trent also finds time to stay connected to WPI. Not only has he volunteered his time to meet with WPI students, he and his wife, Sharon, have created two endowed funds to support areas that were most impactful to him. The Sharon S. and A. Trent Germano '71 Endowed Fund for Athletics was established to honor the life and leadership skills Trent learned while wearing #63 as a member of WPI's varsity football team, and the A. Trent Germano '71 Endowed Scholarship will help make a WPI education more affordable for students. Both Trent and Sharon were welcomed into the Alden Society in 2020 for their support of WPI's mission through their endowed funds.

#### 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](https://plannedgiving.wpi.edu).

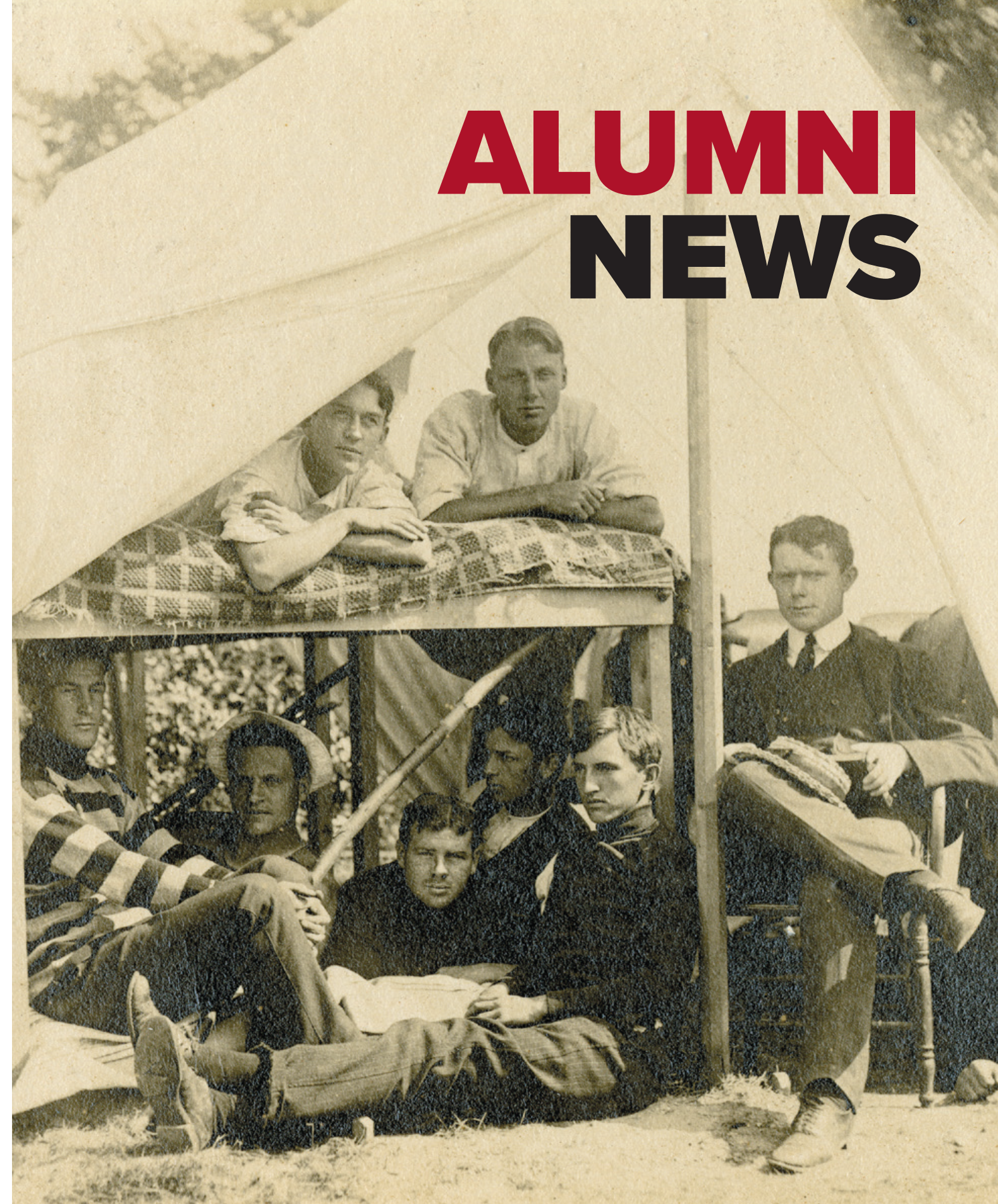
#### FOR MORE INFORMATION CONTACT

Lynne Feraco  
Assistant Vice President of Gift Planning  
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ALDEN  
SOCIETY

# ALUMNI NEWS





# From the Desk of

ALUMNI ASSOCIATION PRESIDENT **PAMELA (GIASSON) LYNCH '05**

Dear Alumni,

As I begin my leadership of the WPI Alumni Association, I'd like to thank my predecessor, **Paula Delaney '75**, for her term at the proverbial helm. Paula's level of dedication and commitment to the university is a true inspiration. I'd also like to thank you for affording me this opportunity to represent you for the next two years; I'm looking forward to serving you in this role.

It's always great to be back on campus, but the beginning of my tenure feels like an especially exciting time on the Hill.

In early April, the university welcomed its 17th president, as Grace Wang officially joined the WPI community. She said of the university, "I am excited about the work and the opportunities ahead and wholeheartedly believe that WPI has everything it takes to further excel." Alumni had the opportunity to hear from President Wang during Alumni Weekend in May, and it was inspiring. There will be more opportunities to hear from her in the coming year.

Also during Alumni Weekend, WPI recognized alumni for outstanding professional achievements and service to the university with the 2023 Alumni Association Awards. See page 45 for more information.

The WPI community also celebrated the 100th anniversary of Higgins House. Still one of the university's most iconic buildings, Higgins House currently houses the WPI Alumni Center. Be sure to visit it the next time you're on campus.



Everything great at WPI happens with the support of WPI's generous alumni donors. With that in mind, I hope you'll support Giving Day (in September) and *Beyond These Towers: A Campaign for WPI*.

In October, WPI hosts two prestigious conferences. The Nature Conference, beginning Oct. 17, will be held on the East Coast for the first time. It will discuss the development of nucleic acid medicines—both the recent clinical successes and the current and upcoming challenges. By bringing together academics in basic and translational research and their peers from thriving biotechnology companies and promising start-ups, the conference aims to foster dialog and to spearhead collaborations in the field.

The second, beginning Oct. 19 and hosted by The Business School, is the inaugural conference on FinTech for Inclusivity, Growth, and the Future at WPI, and it marks the first time the Future Finance and Economics Association will offer a conference event in the United States. Digital financial scholars will present new ideas and discuss the future direction of FinTech research.

Securing these highly coveted and esteemed conferences for the university validates, yet again, WPI's position as a premier polytechnic university and brings pride to our worldwide alumni community.

Thank you again for letting me serve you during my tenure as Alumni Association president. I look forward to seeing you on campus.

ILLUSTRATION BY ZOE PAPPENHEIMER



**WPI**

ALUMNI  
ASSOCIATION

It was wonderful to welcome so many back to The Hill for Alumni Weekend 2023, as alums returned to revisit favorite campus spots, reunite with friends and classmates, and relive the traditions and memories that made our WPI experience so special. Of the many fun and exciting weekend events, Saturday's Honoring Our Champions award ceremony was especially meaningful and impactful to all, as the Alumni Association bestowed its notable awards to very deserving alumni.

## ALUMNI AWARDS

### CONGRATULATIONS TO OUR 2023 ALUMNI AWARD RECIPIENTS

Recognized for their remarkable professional achievements and service to the university, these alumni bring pride to the entire WPI community. They were celebrated by their classmates, families, and friends during Alumni Weekend, May 19–21.

#### ROBERT H. GODDARD ALUMNI AWARD FOR OUTSTANDING PROFESSIONAL ACHIEVEMENT

RICHARD J. COURNOYER '98, MS '99 • KERRI O'CONNOR DIPIETRO '98 • JAY HEDLEY '88  
KAREN CASELLA '83 • ERIC SOEDERBERG '83 • JAY J. SCHNITZER '73, MD, PHD

#### ICHABOD WASHBURN YOUNG ALUMNI AWARD FOR PROFESSIONAL ACHIEVEMENT

DONAL BOYD '13, MS '14 • SAMUEL GUTMANN '03 • M. RYAN MCDEVITT '03, PHD • MATTHEW SHEA '03

#### HERBERT F. TAYLOR ALUMNI AWARD FOR DISTINGUISHED SERVICE TO WPI

LINDALEIGH R. ABERDALE '88 • WILLIAM A. FITZGERALD '83 • PETER MCDERMOTT '73

#### JOHN BOYNTON YOUNG ALUMNI AWARD FOR SERVICE TO WPI

VEDA BOOTH '18 • JEAN PAUL MIRALDA '13



## TEACHING LIFE SKILLS ON THE BASKETBALL COURT

With lessons learned from his own challenges, **Ryan Brown '11** offers basketball clinics with a larger message.

Growing up with hearing loss—classified as “profound” in his left ear and “severe” in his right—Ryan Brown understandably struggled.

There was the challenge of learning to effectively communicate, but also of spending long stretches away from home at a school for the deaf, bearing the brunt of bullies, and being told over and over again that he would never be able to do the things he wanted to do (like play sports).

But he learned to adapt and embrace challenges—and he wants local kids to do so, too. An athlete, coach, and full-time transportation industry analyst, Brown founded the nonprofit Go Hard or Stay Home (GHOSH), a low-cost kids’ basketball program now in its fourth year and with hundreds of participants.

“This program helps kids learn, practice, develop, and improve their basketball skills,” Brown says. “And, more important, offers mentorship, motivation, and encouragement toward school and life.”

### Working hard, constantly adjusting

Brown didn’t speak his first word until he was 5. Although he grew up in Worcester, he attended the Clarke School for Hearing and Speech in Northampton, staying at the school throughout the week and spending weekends and holidays at home with his family.

He pushed through his disability, eventually being accepted at Holy Name High School, where he played the trifecta of basketball, baseball, and football. Notably, he was a 1,000-point basketball scorer who helped lead Holy Name to consecutive Division I state finals.

“I’ve always had to work harder at things and make adjustments that would work for me with my hearing,” he says. “But I’ve been doing that my whole life, so adding new things I wanted to do was just another day for me.”

How he communicates with others depends on the environment, he explains. For instance, when he was young, he and his coaches and fellow players worked out signals on the courts and in the field based on whether he could use his hearing aid (in the case of football, because of the helmet, he couldn’t). More recently, during the pandemic, with mandatory mask orders preventing him from reading lips, he developed gestures and other means of communication.

“My family always supported me and had me involved with activities and told me all you have to do is try,” he says. “If you want something, you work hard for it.”

Brown studied industrial engineering and played basketball and baseball at WPI. It was a stressful time, he concedes, but his college years helped him learn to juggle responsibilities, balance his time, and control stressful situations. He found co-op opportunities that

led him to his current position with the U.S. Department of Transportation. It was also at WPI that he discovered his passion for helping and inspiring others: While on the WPI basketball team, he became involved in the Big Brothers Big Sisters program.

“It showed me how giving even just a small amount of my time helped the kids,” he says. “It was something that stuck with me. I wanted to do more.”

### Never judging, always giving back

Soon, he did: While coaching Amateur Athletic Union (AAU) basketball after graduation, he noticed that many kids who wanted to play simply couldn’t afford to pay the high fees. This prompted him to start GHOSH (pronounced “gosh”) with just a handful of kids at St. Bernard’s Church gym in Worcester. The program has grown exponentially, with 2,000 participants to date.

“Each week more kids showed up,” says Brown, who notes that a \$5 per session donation is requested of those who can afford to pay. “They just wanted to learn how to play, improve their skills and have a safe place to go.”

The program teaches boys and girls of all ages and skill levels basketball basics—and, Brown hopes, confidence, determination, and the understanding that it’s OK to struggle. As he puts it, he likes to get to know players personally to understand where they’re coming from and where they want to go.

“It’s teaching these kids the importance of school, why we should never judge, and why we should always help and give back to those who are struggling or are in need of help,” he says.

To that point, GHOSH has also donated to dozens of area families during the holidays, organized events such as backpack and school supply drives, and helped the Worcester Police Department hand out candy to kids on Halloween. “It’s teaching kids to be kind, respectful, believe in themselves and support others—most important, the community,” Brown says. He drives home the mantra “Don’t let a disability or disadvantage stop you from what you want to do with your life.”

Naturally, his goal is to expand GHOSH beyond Worcester, as funds, space, and time allow.

“I do what I can now, rotating to find affordable gyms throughout the year to hold sessions,” Brown says. “Yes, it is a lot of work—but it’s worth it.”

—Taryn Plumb

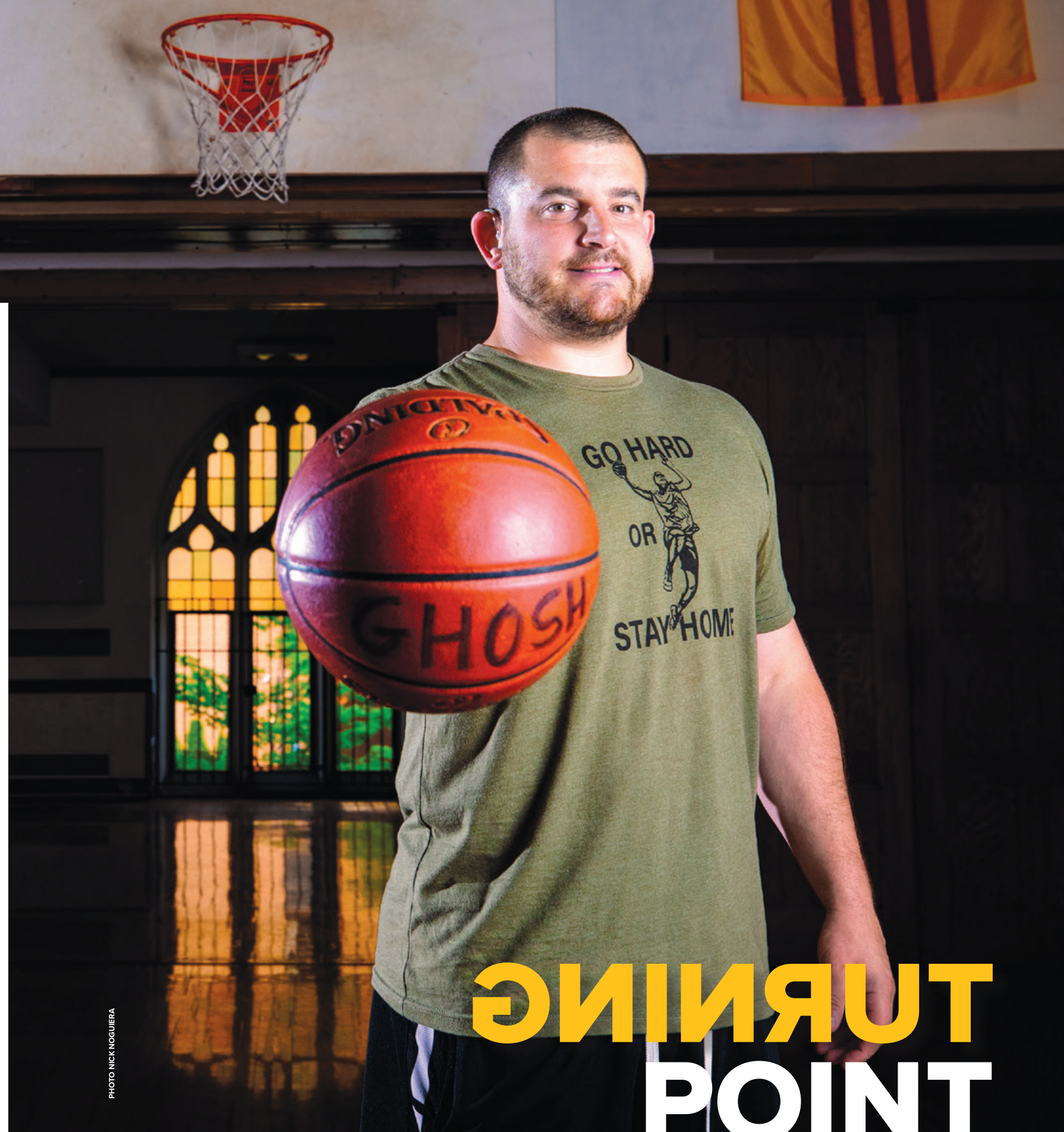


PHOTO NICK NOGUIERA

# TURNING POINT



## Chandler Lyles Grows Outside Her Comfort Zone

When **Chandler Lyles '16** came to WPI for the engineering focus it offered, she never predicted a future that included the pursuit of a doctoral degree in business administration and success as a fashion entrepreneur. And while the two professional pursuits might seem distinct, it was Lyles's engineering and business education that provided the foundation and opportunities that launched both.

After graduating in 2016 with a management engineering degree and a concentration in mechanical engineering, Lyles went on to complete her Global Executive MBA (GEMBA) studies at Neoma Business School in Paris in June 2022. Currently working as a senior product IT manager at Dell Technologies, she's also an entrepreneur who founded CL Styles, a personal wardrobe styling company, while a student at WPI. Soon she will head to Baruch College in New York City to begin an Executive Doctorate in Business Administration (EDBA) program in international relations with a concentration in diversity, equity, and inclusion. "Right now, I'm living and enjoying my life in Paris," she says, "and will be bicontinental between Paris and New York City to pursue my degree and to work on my fashion business in those major fashion cities."

Lyles has many interests and talents, but WPI was the catalyst for dreaming big. The opportunities to try new courses and the support of faculty made a significant difference. When she arrived at WPI, she focused exclusively on mechanical engineering because that was her original path. While she had the passion for discovery, she encountered her share of struggles, including taking an NR in physics twice. Then a friend recommended that she look at WPI's Business School degree programs because they seemed more aligned with her interests. That suggestion opened up a new world.

The Business School curriculum and faculty support helped Lyles thrive. "My brain hasn't ever worked in a typical engineering way," she says. "It doesn't strictly work with numbers. The classes combined business, tech, and people, and that has made me a more versatile person. At Dell, I can be a liaison between tech and engineering because I know about both. Being able to do that gives me an edge, and WPI helped me with that."

### Advisor, Confidante, Friend

That kind of academic and personal connection was personified when Lyles met Professor Adrienne Hall-Phillips, who was her academic and

Major Qualifying Project advisor and is now a close confidante and friend. "She is why I went for my master's and my doctorate," she says. Lyles talks about Hall-Phillips as a life advisor who helps guide her through her educational and professional pursuits.

"Chandler was the typical WPI student who was interested in a thousand things," Hall-Phillips says, laughing. She helped guide Lyles through her academics and then the two stayed in touch. Eventually all those interests posed real career potential, and she was able to present options that Lyles hadn't even considered. "I asked if she had thought about grad school and furthering her education in a topic that's interesting to her," she says. "I said, 'You know, you don't have to stay in the U.S.'" And when Lyles talked about wanting to teach, Hall-Phillips urged her to consider a PhD. "It's about telling people about things they had not thought possible," she says of mentoring students to achieve their potential.

Lyles says two WPI project experiences — her Humanities and Arts project in Morocco and her Interactive Qualifying Project in Namibia — helped her develop the ability to work successfully on professional teams. Learning how to use her discomfort as a foreigner in different parts of the world, or as the only person of color on a team, gave Lyles a valuable perspective that helps her successfully navigate team dynamics to this day. "It opens the dialogue," she says, "and we have one common goal."

Stepping wholeheartedly into new experiences is Lyles's go-to mode, and she relies on the guidance of mentors like Hall-Phillips so that she doesn't take a leap without some understanding. She's succeeded and failed and turned the lessons from each into something better. "Chandler is going to do really great things and I can't wait to see it," says her mentor.

"I never thought in a million years when I was applying for my master's program that I would ever be where I am," Lyles says. Her experiences at WPI, particularly the grueling ones, amplified her resilience to bounce back when life got really challenging. "It's also guided what I tell students today," she says. "Be open minded and be okay with being uncomfortable. Nothing grows when you're in a comfort zone."

—Julia Quinn-Szcesuil







*“Blair and I strongly believe in the need to support students of all backgrounds to produce more well-rounded, socially aware engineers, so we established the Blair Clarkson and Matt Runkle ’11 Fund in support of the Office of Diversity, Inclusion, and Multicultural Education (ODIME) initiatives.” —Matthew Runkle ’11, right*

## Philanthropy Supports WPI’s Diverse and Dynamic Community

ALUMNUS AND HUSBAND ESTABLISH THE BLAIR CLARKSON & MATT RUNKLE ’11 FUND

When **Matthew Runkle ’11** chose WPI for his institution of higher education, he was looking for both the foundation of an accomplished career and a comfortable place to figure out who he was to be in the world.

The computer science major and electrical and computer engineering minor says, “While I knew WPI would afford me opportunities for a suitable career, I also believed the small and welcoming campus would provide me an ability to build a close group of friends and help me determine which values were most important to me.”

At WPI, Runkle found his friends and succeeded at growing into the person he’d hoped to become. Offering that a big part of his growth came from joining Phi Kappa Theta fraternity, Runkle says, “As a fraternity brother, it was quickly apparent how impactful the Greek community was within the greater WPI community. Most of the leaders of the large campus clubs were Greek and much of the social life around campus was associated with Greek Life. I feel like the community service element of Greek Life pushed me out of my shell and enabled me to participate in a lot more than I would have on my own. Those lessons of not being afraid to try something different, or jumping in and learning as you go, continue to stay with me today.”

Finding his way out of his proverbial shell, Runkle also joined WPI’s Student Government Association, *The Peddler* yearbook team, Upsilon Pi Epsilon, and Crimson Key. He also chose to conduct his Interactive Qualifying Project in Hong Kong.

While a student, he secured an internship with Raytheon BBN Technologies and was hired there as a staff scientist upon his graduation. Today, he is a software infrastructure and security practitioner serving as director of cloud engineering for SmartBear Software. SmartBear builds application programming interface design, software testing, and developer observability tools to ease software development challenges.

When Runkle met his spouse, Blair Clarkson, who worked for a few years in WPI’s Global Projects Program, their shared connection

to WPI became especially meaningful to the couple. Clarkson, now a French and Spanish teacher with the Advanced Math & Science Academy, says, “Having come from international education, I loved WPI’s push for global projects and the hands-on approach to project-based learning.” Runkle echoes Clarkson’s sentiment, saying, “We’re both passionate about education, particularly learning environments that build practical life skills and promote cultural empathy. WPI’s model of *Lehr und Kunst*—especially with the focus on societal impact—makes WPI a special place for both of us.”

The couple’s shared connection to WPI and passion for education inspired them to establish the Blair Clarkson and Matt Runkle ’11 Fund to support students in need of the resources offered by WPI’s Office of Diversity, Inclusion, and Multicultural Education. “Blair and I strongly believe an important aspect of learning is looking beyond one’s own upbringing to appreciate the beauty in other cultures, backgrounds, and different ways of seeing the world,” says Runkle. “Especially in today’s political climate in the United States, where we see greater calls for censorship, less ability to see another person’s perspective, and the curtailing of LGBTQ+ rights, we see the need to encourage more diversity of thought as ever more dire, and we are proud to play our role in the solution to this societal issue.”

When asked about the impact of the Blair Clarkson and Matt Runkle ’11 Fund, **Arnold Lane Jr.**, director of multicultural education and community engagement, says, “Alumni gifts supporting student diversity initiatives allow the school to be both innovative and creative in designing sustainable infrastructure and learning experiences for our diverse student populations. Our gratitude for these types of gifts really goes beyond words, because, more often than not, gifts have a clear and direct impact on the student experience—whether this relates to sending them to a life-changing conference, providing funding support for personal expenses, or distributing micro-scholarships to help students and their families during the holidays; every little bit goes a long way.”

—Sira Naras Frongillo





VALENTIN GAPONTSEV

## Inspiring Innovation in Photonics

NEW FUND HONORS THE LEGACY OF VALENTIN GAPONTSEV.

**Valentin Gapontsev**, who received an honorary doctor of engineering degree from WPI in 2001, was an internationally recognized physicist widely known as the “Father of the Fiber Laser Industry.” When he founded IPG Photonics in 1990, he combined his technical knowledge with his strategic vision for the potential uses of high-power fiber-optic lasers. Headquartered in Oxford, Mass., IPG is an internationally dominant manufacturer of laser equipment.

In 2001, with the burgeoning job market in photonics and the need for greater photonics research, Gapontsev began a long partnership and record of generous support with WPI. It started in Olin Hall with the establishment of the IPG Photonics Laboratory, a valuable academic resource for teaching photonics with emphasis on fibers, lasers, and detectors.

Over the years, the partnership between WPI and IPG has deepened. Dozens of WPI alumni are employed by IPG across the United States, and WPI and IPG collaborate on education, training, and workforce development. IPG, a participant in WPI career fairs, has also sponsored meaningful project experiences for students that benefit the company.

Gapontsev passed away in October 2021, but his legacy lives on at WPI. The Gapontsev family has continued to support the university in critically important ways. In the face of Russia’s war against Ukraine, for example, the Gapontsev family has provided support for students affected by the war. Reflecting Valentin’s penchant for innovation and scientific discovery, the family recently established the Gapontsev Family Collaborative Venture Fund, with the goal of incentivizing, catalyzing, and inspiring interdisciplinary collaboration across the WPI enterprise with a special focus on photonics. The seed grants, awarded through a competitive process, will enable more successful research endeavors.

“This fund will reward curiosity and enable WPI’s bold thinkers to pursue ideas with the potential for high reward as they use the data

generated from this research to apply for larger grants,” says **Bogdan Vernescu**, professor of mathematical sciences and vice provost for research. “We are grateful to the Gapontsev family for their support of our faculty and students. We are proud to honor the legacy of Valentin Gapontsev and his enduring commitment to the scientific community through this fund and the IPG Photonics Lab.”

“Our faculty aspire to be creators, scholars, and innovators who leverage our interdisciplinary research teams and novel approaches to make scientific discoveries in many areas of need including photonics,” adds **Jean King**, Peterson Family Dean of Arts & Sciences. “The Gapontsev Family Collaborative Venture Fund will allow them to do that with the speed and precision that is desperately needed to stay on the cutting edge of science and engineering. We would like to thank the Gapontsev Family for making an investment in our faculty and students.”

Six faculty were awarded Gapontsev seed grants last academic year to support three very different research projects that use photonics to push the boundaries of innovation, while also providing first-rate research opportunities for students.

“The importance of the Gapontsev Family Collaborative Venture Fund is centered on the support of fundamental research that enables new discoveries and the realization of cutting-edge technologies, along with the co-development of the next generation of scientists and engineers in a collaborative and interdisciplinary environment,” says **Doug Petkie**, professor of physics and Physics Department head. “These types of programs are essential for the region to remain strong economically through the generous support of innovative ideas led by the faculty and students at WPI.”

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#### Unlocking the Potential of 2D Nanomaterials

**Lyubov Titova**, associate professor of physics, and her research partners **Ronald Grimm**, associate professor of chemistry and biochemistry, and **Kateryna Friedman**, research assistant professor of physics, used the seed grant to conduct studies on how 2D nanomaterials interact with light. These materials have individual layers as thin as one-millionth of a millimeter and have lateral dimensions that are thousands of times the thickness, Titova explains.

“Many of them have unique optical and electronic properties that are distinct from those of three-dimensional crystals. Our goal is to uncover those properties that are promising for new optical devices that operate in the visible and far infrared (terahertz) range of the spectrum,” Titova says. “The ultimate impact of this work will be new knowledge about optical properties of ultrathin, flexible, inexpensive 2D materials that can be integrated into photonics devices such as lasers, sensors, detectors, and light modulators for optical information processing.”

The Gapontsev grant, she says, has been critical to the advancement of this research, supporting an undergraduate summer researcher and helping purchase supplies and parts needed to extend their experiments. The results of some of those experiments have been submitted to the 48th International Conference on Infrared, Millimeter and Terahertz Waves (IRMMW-THz) to be held in Montreal, Quebec, in September.

“We are honored by the award and extremely thankful for the opportunity to carry out this work,” Titova says. “On a more personal note, we are deeply touched by the Gapontsev family’s creating and supporting WPI Student Disaster Relief Fund & Gapontsev Family Support Fund to help students impacted by the war in Ukraine.” Two members of their team are Ukrainian: Kateryna Friedman’s undergraduate alma mater is Taras Shevchenko National University of Kyiv, and Lyubov Titova’s is The Precarpathian National University in Western Ukraine, not far from Lviv where Valentin Gapontsev studied.

“We have been profoundly impacted by the war, worried about family and friends in harm’s way. We also know how much this support meant for WPI’s Ukrainian undergraduate students.”

#### Detecting Foodborne Bacteria

From food poisoning to grocery recalls, foodborne bacteria impacts everyone. **Yuxiang (Shawn) Liu**, associate professor of mechanical engineering, and his co-PI Christopher Lambert, teaching professor of chemistry and biochemistry, are seeking a better way to help us avoid foodborne bacteria. The Gapontsev grant supports their research into a portable, rapid method for detecting foodborne bacteria in the field.

Foodborne bacteria play a big role in food contamination, Liu explains, and can result in foodborne outbreaks, recalls, sickness, and even death. Complicating the issue, he says, contamination can happen anywhere along the supply chain from farm to table.

According to Liu, “Currently the gold standard detection method for foodborne bacteria still relies on bacteria plating, which requires equipment in a testing center and generally 24 to 48 hours to obtain the results. In short, current testing methods are limited in locations and in response time.” Importantly, this also limits how quickly and efficiently communities can react to an outbreak.

Liu and Lambert envision a foodborne bacteria detection device that can provide results at any location point, as well as a detection patch included in food packaging to warn whenever contaminants are present. This technology would enable anyone with little training to determine the biosafety level of foods within a few hours, Liu explains. Lambert adds that everyone can benefit from reduced foodborne outbreaks—people in resource-limited areas to soldiers on the battlefield—and this technology could be applied to any bacteria, not just foodborne bacteria.

“The general support of the Gapontsev Fund provides an opportunity for us to prove the concept of this idea, and the preliminary data will significantly enhance our chances to obtain major funding support from federal agencies.”

“We deeply appreciate your kind support of our research, and your support is essential for us to push forward this idea to eventually benefit the masses in the future,” Liu says of the Gapontsev family’s support.

#### Using Light to Deliver Lifesaving Drug Treatments

“I have been working in drug delivery since my first research experience in 2004,” says **Jeannine Coburn**, associate professor of biomedical engineering. “I am always exploring new ways to deliver drugs using biomaterials.”

Coburn’s team at WPI’s Functional Biomaterials Lab develops drug delivery systems for cancer treatment. The Gapontsev grant supports Coburn’s collaboration with Titova and the members of the Ultrafast Terahertz and Optical Spectroscopy Lab “to open up the potential of using light to study our drug delivery systems and engineering novel strategies to improve cancer treatment.”

“We are using light-material interaction to uncover this fundamental knowledge,” Coburn says.

Importantly, she adds, the Gapontsev award has enabled several meaningful research experiences for undergraduate and graduate students. These students received training on specialized equipment, learned lab techniques, and identified their own research interests. One student, thanks in part to this experience, has been accepted to a PhD program at the University of Colorado, Boulder.

“We are grateful to the Gapontsev family for providing the funding for this project. It supports our collaboration, not only financially but with protected time, across multiple disciplines, which is truly where innovation occurs,” Coburn says.

—Judith Jaeger

# THE HERD COMES HOME



## HOMECOMING 2023

SEPTEMBER 29 & 30

[wpi.edu/+homecoming](http://wpi.edu/+homecoming)





**Keith Gigliotti '96, Brett Carbonneau '18, Nathan Alvord '16, Vince Tanguilig '21, and Karina Naras '19** work for Boston Metal, which was selected for the 2023 North American Company of the Year Award by the Cleantech Group. Its work was chosen from 16,000 nominations from 93 countries. The five are part of the team working to decarbonize steelmaking, one of the largest industrial sources of CO<sub>2</sub> emissions. The award recognizes the strength of Boston Metal's Molten Oxide Electrolysis technology to lower carbon emissions in the steel industry.

## 1957

**Bob Propper** writes, "WPI gave me a super education. After an electrical engineering degree, I went to Yale and came out with a Master of Fine Arts degree. I was in love with science and art, so I studied both. I found that the two were very compatible. I am a graphic designer. I never thought of my career as one or the other, but an exciting life producing art and science together. One of my

projects was a children's book, *Reengineering Mother Goose*, the first children's book published by the Museum of Modern Art in New York City. All the illustrations were made from parts of circles."

## 1967

**Bill Hyatt** writes, "During our travels, my wife, Alice, and I stayed in Boston for a night, flying out the next day to Denver. Linda



▶ **BILL HYATT '67 AND HIS WIFE, ALICE, WITH HARRY TAYLOR '67 AND HIS WIFE, LINDA**

and **Harry Taylor '67** joined us for breakfast. It was a lovely time!"

## 1973

**Jay Schnitzer**, MITRE's chief technology and medical officer, was selected as a 2023 Federal 100 honoree for "his leadership in enabling better health outcomes for patients by unlocking the vast research and treatment insights of interoperable electronic health records," according to an announcement from FCW. At MITRE, he has helped launch mCODE, a common data standard and language for cancer care that enables access to anonymized data on the characteristics, treatments, and outcomes of cancer patients. This aims to help find new insights and improve cancer treatments. The Federal 100 recognizes leaders in government, industry, and academia who are transforming government and its ability to deliver on critical missions.

## 1975

**Kazem Sohraby** is currently a professor of electrical and computer engineering at Utah Valley University (UVU). After graduating with an MS in electrical engineering from WPI, he went on to earn a PhD at New York University. He was recently named a fellow of the National Academy of Inventors (NAI). The NAI Fellows Program "highlights academic inventors who have demonstrated a spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on the quality of life, economic development, and the welfare of society. Election as an NAI Fellow is the

highest professional distinction awarded to academic inventors," according to an announcement from UVU.

**Jeff Webber** published his second book in his Enimmori series, *Enimmori: Discovery*, in September 2022. His first book, *Enimmori: Arrival*, published in December 2021, tells the story of "an engineer accidentally transported to a world where magic is real." The third book of the series, *Enimmori: Challenge*, is scheduled for release in summer 2023; he is working on the fourth, *Enimmori: Crisis*.

## 1976

**Paul Kalenian** was featured on *Jay Leno's Garage*. Describing himself as a "self-taught engineer" when it comes to cars, he designed and built a '60s Indy car in 2021 called Lulu. In the episode, he discussed his process for designing and creating the vehicle, including multiple changes to the parts used.

## 1977

**Roberta Shea**, a global technical compliance officer at Universal Robotics, was selected for one of two 2023 Joseph F. Engelberger Robotics Awards, one of the world's most prestigious robotics honors. She was selected for her work over the course of her career in global robotics safety. She says, "The Engelberger Robotics Award for Application in Safety is a tremendous honor to me and to all those who have embraced and contributed to robotics safety. I remember meeting Joe Engelberger over 40 years ago and never imagined receiving this award. I view it as honoring the industry's progress



▶ LAST SUMMER A GROUP OF US ALUMS GOT TOGETHER FOR ITS QUASI-ANNUAL RETREAT AT THE HOME OF GIL MARTIN '80 AND CANDI (BUCKLEY) MARTIN '80. PICTURED, FROM LEFT: RICK GOULDING '80, MARK LEFEBVRE '80, JIM DECARLO '79, CANDI, GIL, JOHN PANORA '81, AND CHRIS DENNISON '80.

in optimizing safety and productivity. The journey has been amazing!"

## 1978

**Wes Wheeler** retired as president of UPS Healthcare after 43 years in the industry. During his time as president (since January 2020), he oversaw the transportation of over one billion COVID-19 test kits across the country and the delivery of nearly two billion COVID-19 vaccines to more than 110 countries. Wheeler has been involved in every key functional area in pharmaceuticals, including manufacturing, drug development, supply chain logistics, marketing, and engineering.

## 1979

**Steve Rusckowski**, a WPI trustee, has joined the supervisory board of QIAGEN, a multinational bioinformatics and diagnostics provider based in the Netherlands. He is an internationally recognized healthcare industry executive and former chairman, president, and CEO of Quest Diagnostics.

## 1980

**James DeCarlo** was appointed to the Orlando Science Center (OSC) Board of Trustees for a three-year term. OSC is a hands-on science museum that hosts exhibits and

workshops with 670,000 annual visitors. He works to ensure the center's recognition as a trusted, financially secure resource in the community, advocating for its STEM programs. "The Orlando Science Center is a vital community asset in Central Florida, and I am honored and delighted to be joining its board. I look forward to working with my fellow board members to support the Center's mission to inspire science learning for life among diverse audiences across Central Florida and beyond," he says. He is a member of the global law firm Greenberg Traurig in its intellectual property and technology practice.

**Mark Lefebvre** writes, "I remain director of community engagement at Pinetree Institute (Eliot, Maine) where I help New Hampshire and Maine communities build their capacity for substance use disorders. I currently lead the Greater Portsmouth (New Hampshire) Recovery Ready Community coalition, the York County (Maine) Recovery Ready Community coalition, and the Lewiston-Auburn (Maine) Recovery Friendly Workplace initiative. I also continue to host my weekly radio show, *Scurvy Dog Radio*, on WSCA 106.1 FM Portsmouth Community Radio and have recently published my first book, *A Place in Time: Youth, Community & Baseball*, which is available at TidePool Bookshop in Worcester and on Amazon.





▶ 1986 CLASSMATES RICK FARLAND AND MICHAEL GONSOR VISIT BRITISH COLUMBIA



## 1981

**Stephen Zalewski** joined Inspira Enterprise, a global cybersecurity services organization, as a strategic advisor. He is the former chief information security officer at Levi Strauss & Co. and brings 40 years of enterprise and cybersecurity experience. He also serves as an advisor to a multitude of security organizations and venture capital firms.

## 1986

**Jim Daley** is chief operating officer at Bearing, a maritime start-up in AI-powered vessel optimization and insights for maritime shipping. He has extensive experience in building and leading teams that introduce innovative and disruptive technologies. "I'm eager to continue advancing new technologies for the maritime industry alongside the very talented team at Bearing," he

says. "As new regulations are set to reshape the industry, Bearing is uniquely positioned to make ocean shipping greener and more efficient. There is a tremendous opportunity for Bearing to keep the industry moving forward with its CII compliance and fleet performance management tools enabled by proven AI modeling and our massive data sets of historical and real-time voyage operations data."

**Rick Farland** and **Michael Gonsor** traveled to Whistler, British Columbia, for a week of skiing and snowmobiling in the Canadian Coastal Mountains this past February. The photos at left were taken on a snowy day in the Brandywine Bowl just outside Whistler.

## 1987

**Tom Cappelletti** created the John P. Connors Memorial Fund with **Joe Mitchell '87**, **Mike Crowley '87**, **Bob McGuirk '87**, **Todd Moline '86**, and **John Connors '17** to honor **Lt. j.g. John P. Connors '87, USN**, who was killed in action in Panama in 1989 as part of Seal Team 4 during Operation Just Cause. Tom writes that the money raised will be used to design, cast, and dedicate a statue to honor John in his hometown of Scituate, Mass., within the next 18 to 24 months. For more info, visit [www.ameasureofaman.org](http://www.ameasureofaman.org).

## 1989

**Jeffrey Goldmeer, MS '91**, was part of a leadership training event at General Electric's Crotonville Management Training Center in February. He is a technology director for GE, focusing on decarbonization, and was a

scholar-in-residence for the summit, providing an in-depth seminar on energy transition.

**Debora Jackson** was named to the 2023 *Worcester Business Journal* Power 50, an annual list that highlights influential local leaders in various sectors, from government to industry to education. The article featured her work as dean of The Business School at WPI, including the development of the university's technology-focused business education, the partnership between WPI and the Nigerian University of Technology and Management, and The Business School's launch of AMP! (Advisors, Mentors, and Partners) program.

## 1990

**Paul Dombrowski** was recognized by the New England Water Environment Association (NEWEA) with its Founders Award at the annual conference this past January in Boston. Founders Awards are given to recognize long-term contributions to NEWEA, dedicated service to the water pollution control industry, and notable achievements in the environmental field.

## 1991

**Richard Hoey** was named co-assistant manager of the city of Olympia, Wash. He oversees several of the city's leading programs including housing and homelessness, climate issues, public defense, and economic development. He also leads the Community Planning and Development Department. He has worked for the city of Olympia for more than 10 years.

## 1992

**Jen Schaeffe** is a senior engineering consultant at Kleinschmidt Associates, a firm that focuses on engineering, regulatory, and environmental consulting. With more than 30 years of industry experience, Jen specializes in project and technical management of civil engineering projects and has held leadership positions for large, multi-year, multi-disciplinary civil engineering projects in the environmental and nuclear sectors. She says, "I'm excited to join Kleinschmidt's team working to deliver high-quality projects for the public benefit."

## 1994

**Ted Dysart**, a former WPI trustee, was named managing director of Russell Reynolds Associates, a global leadership advisory firm. His role focuses on board, CEO, and succession planning engagements for industrial, consumer, financial services, social impact organizations and family-owned enterprises, according to the company's announcement. He has served as a guest lecturer at George Washington University, Northwestern University, and The University of Chicago. He was named in *Bloomberg Businessweek's* Top 150 World's Most Influential Headhunters in the World and *Directorship Magazine's* Directorship 100, a listing of the most influential individuals in corporate governance, among other industry awards.

## 1995

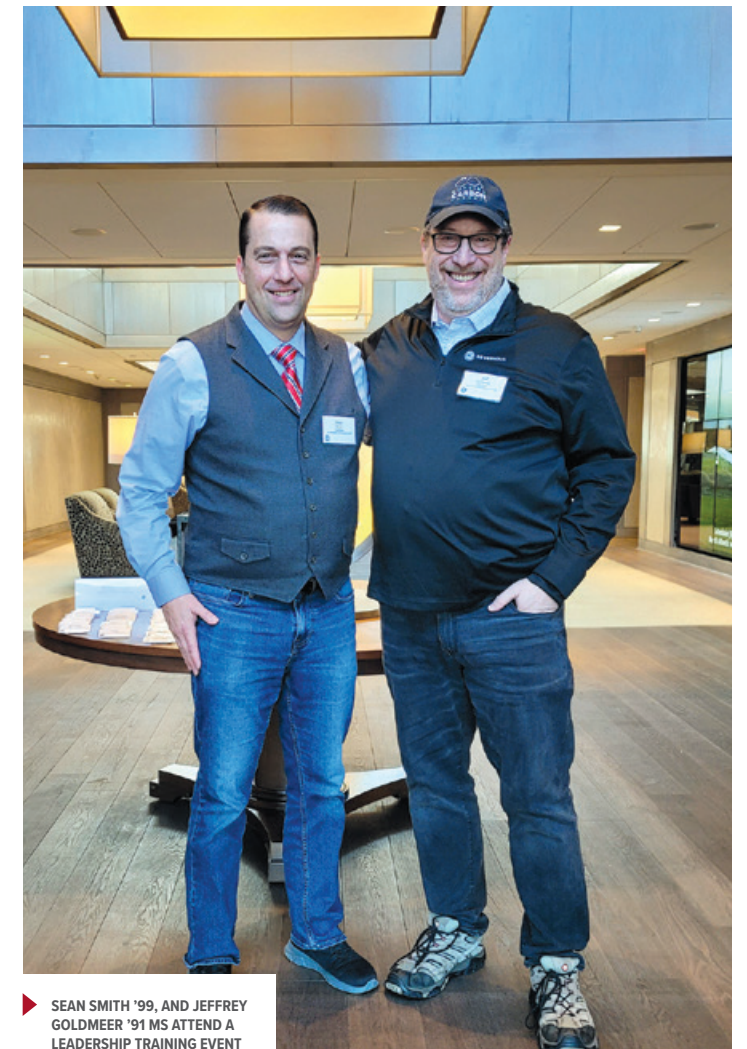
**Derek Adams** was appointed to the Board of Directors of AlloVir, an

immunotherapy company. He has more than 20 years of experience in leading the manufacturing of biologic and gene therapies at all stages of development. He is CEO of Stellar Bio, a private biotechnology company pioneering a platelet-inspired cell therapy platform for regenerative medicine. He previously served as president and chief executive officer of PlateletBio.

**Andrew Johansson**, director of hydraulic modeling and consulting at Alden Research Laboratory, was selected as the 2022 Standards Partner of the Year. The award recognizes an individual whose "insight and participation has advanced the work of the Hydraulic Institute through their exceptional volunteer leadership," according to the company's announcement. He has over 30 years of experience in the industry.

## 1998

**Lori Corcoran (MS)** was featured in Merrimack College's student newspaper, *The Beacon*. The article discussed her work in Merrimack's Office of Accessibility and the challenges she has faced as a result of her hearing loss. She previously worked at Quinsigamond Community College supporting deaf and hard-of-hearing students. "Everybody is behind the 8-ball when it comes to accessibility and accommodations," she said in the story. "In higher education, it's nice that they have offices and are able to support students with disabilities, but I think it's also important to support staff and faculty with accommodations and take a look at everybody. Do they have more



▶ SEAN SMITH '99, AND JEFFREY GOLDMEER '91 MS ATTEND A LEADERSHIP TRAINING EVENT

work to do when it comes to accessibility? Absolutely, but I think everybody has more work to do, it's becoming everyone's business versus just our (people with disabilities) business."

## 1999

**Steven Gentilucci**, a general manager at Consigli Construction, was quoted in the *Worcester Telegram & Gazette* about Working for Worcester Build Day, a volunteer community building day that takes place across 20 sites in Worcester. "As a longtime

Worcester resident and an active member of the community, I know firsthand the value that this organization's annual Build Day provides to the community and the families who call our city home," he said in the story. "The ability to give back and help build and transform spaces for kids throughout Worcester makes what we do as builders worth it." He is part of Working for Worcester's Board of Advisors. **Jose Jimenez** was promoted as the national leader for Gilbane Building Company's Life Sciences Center of Excellence. In his role at





## GIVING DAY IS COMING!

Join the WPI community beginning Wednesday, September 13, for Giving Day! WPI's single biggest philanthropy event of the year gives you exciting opportunities to make an impact in a BIG way—such as . . .

- Coming together with 1,000+ alumni, parents, faculty, staff, students, and friends
- Leveraging challenges and matches to make your gift go further
- Supporting Giving Day ambassadors who are raising funds for their WPI passions
- Making an even bigger impact for the innovators, educators, makers, and doers of today and tomorrow.

**Giving Day is about celebrating and supporting all the things—and all the people—that make our home on the Hill great. Follow the exciting Giving Day action here: <https://givingday.wpi.edu>**

**BEYOND  
THESE TOWERS**

September 13–14, 2023

**GIVING DAY**



the construction management firm, he “leads a cross-functional group of professionals in the life sciences sector to provide innovative services to clients across the country,” according to the announcement. He has nearly 25 years of experience in the life sciences industry.

**Eric Langlois** was appointed chief revenue officer at iSpecimen, an online global marketplace that connects scientists with biospecimens for medical research. He manages a commercial team that focuses on aligning customer needs, streamlining collaboration, and supporting innovation and productivity necessary for driving company growth. He joined iSpecimen in 2016 and has held several senior sales positions. His previous work includes guiding sales operations for companies focused on pre-clinical research, such as ReproCELL, BioServe, and SeraCare Life Sciences. He says, “My career at iSpecimen has shown me the infinite impact that the company’s advanced offerings have and will have on the entire life sciences industry.”

**Aswin Phlaphongphanich** is co-founder and CEO of DeeMoney, a leader in Thailand’s financial technology industry. The company was featured in an article by the *Bangkok Post* that detailed its various accomplishments. The article noted that DeeMoney will be a “game changer” in the Thai financial system.

**Sean Smith** was part of a leadership training event at General Electric’s Crotonville Management Training Center this past February. He currently leads the Operation/Finance Leadership Program for GE Gas Power & GE Renewables and was responsible for organizing a global summit of program participants.

### 2005

**Paul Liberman**’s company DraftKings, an online sports betting company, was featured in an article by PlayMA.com discussing the origins and growth of the business. Co-founded by Paul and two others over a decade ago using their compiled life savings of \$25,000, DraftKings now “boasts more than 1.6 million monthly users and reported as much as \$25 billion in total handle for 2022,” according to the article.

### 2006

**Win Suteerachai** was named an economic specialist to the United Thai Nations political party. He is the founder and CEO of In-Tech Steel Co., a leading auto parts and electric appliance maker in Thailand.

### 2008

**Michael Sangillo** is program manager at Microsystems Technology Office of the Defense Advanced Research Projects Agency at the United States Department of Defense.

### 2009

**Galia Traub** founded the nonprofit Permatours with **Scott Guzman '09** in spring 2021. The organization “brings people together to exchange skills and knowledge through permaculture action and natural build-focused educational events that support biodiversity, personal growth, and the resilience of local communities. Embodying project-based learning, while leaning on theory and practice to build a better world, Permatours has facilitated over 30 projects—reaching and

educating over 1,000 people across the Northeast, Southeast, and Midwest United States,” says Galia. “Permatours’ role is to serve as a connective membrane in the global ecosystem of community groups, environmental action networks, and educators—weaving together innovators, native land stewards, healers, permaculturists, teachers, creatives, and community centers, as well as promoting a culture where people feel empowered to express themselves, learn, and grow.”

### 2011

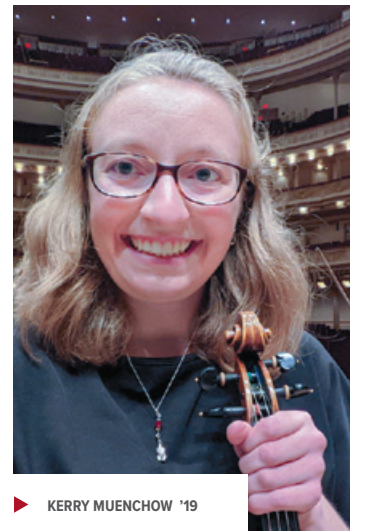
**Jennifer Gallegos** spoke at the SXSW EDU conference this past March. She is the director of strategic sales and communications at Yotta Energy, an energy storage company based in Austin, Texas. As a licensed professional engineer, she has held various roles in project management, sales, and marketing. She also volunteers to help get youth interested in STEM careers.

### 2013

**Erin Pope** has joined Country Bank’s Innovation & Technology Division in Ware, Mass. She said in the company’s announcement, “I am excited to join Country Bank’s history and contribute to its continued success. I hope to support the team by increasing engagement and innovation to support the business and its customers better.” She held previous roles at Digital Credit and American Tower.

### 2015

**Jason Ward** was appointed project manager for Trelleborg



▶ KERRY MUENCHOW '19

Healthcare & Medical, a polymer solutions developer for medical, biotech, and pharmaceutical applications. He manages the company’s value-added services and facility expansion based out of the Northborough, Mass., BioPharma Center of Excellence.

### 2019

**Nathan Johnson**, founder of Verne Bioanalytics, wrote “The Science of Cultivating Cannabis: Tips for a Thriving Grow Operation” in the *Cannabis Industry Journal*. The article discusses the various factors that contribute to successful cultivation of cannabis, including lighting, temperature, airflow, nutrients, and pest control.

**Kerry Muenchow** was appointed concertmaster of the Farmington Valley Symphony Orchestra (FVSO). A freelance violinist in the greater Hartford area, she also plays in the pit orchestra at the Bradley Playhouse and recently accompanied the MasterWorks Chorus’s Verdi *Requiem* at Carnegie Hall. Prior to performing with FVSO, Kerry was the WPI Symphony Orchestra





▶ FIONA DOYLE '21 PERFORMING THE ONE-PERSON SHOW *EVERY BRILLIANT THING*

concertmaster and performed in the Medwin Honors String Quartet, Seele Musicale Chamber Orchestra, and the 2017 MIT Summer Philharmonic Orchestra. When not playing violin, she works as a materials and process engineer at aerospace manufacturer Pratt & Whitney.

## 2020

**Michele Sinopoli (MBA)** was appointed chief medical officer for Saint Vincent Hospital in Worcester and MetroWest Medical Center. She collaborates with hospital physician leaders and medical staff to develop and implement comprehensive clinical quality and patient

safety initiatives. She was previously chief of obstetrics and gynecology at Saint Vincent Hospital. “I am honored to be given this opportunity to represent our talented and dedicated medical staff and to work closely with them to develop and implement initiatives designed to maintain the highest standards of clinical care and patient safety at our facilities,” she said. “As a practicing physician for nearly 20 years, I am passionate about ensuring that every patient receives the highest quality and compassionate care they expect and deserve.” She earned her undergraduate and medical degrees from Boston University.

## 2021

**Fiona Doyle** was accepted into the master’s program Clinical Mental Health Counseling: Drama Therapy at Lesley University. During her time at WPI, she completed her minor capstone in theater by performing the one-person show *Every Brilliant Thing* outdoors at Higgins House during the height of the COVID-19 pandemic.

## 2022

**Daniel Mbusa** is a member of the UMass Chan Medical School Pipeline for Underrepresented Students in Medicine (PRISM). This program “offers clinical

research and mentorship opportunities for undergraduate and postgraduate students from Worcester-area colleges,” according to a UMass Chan Medical School news story. Mbusa coordinates studies that address blood thinner usage disparity, especially for patients with atrial fibrillation (AFib). He says, “We’re gathering stories from Black patients about their experiences with blood thinners, hoping they can encourage more Black patients with AFib to use blood thinners since there’s an underuse of anticoagulant in the Black community.”



### Joseph Sage, Longtime Civil Engineering Professor and Artist

**Joseph D. Sage**, professor emeritus of civil and environmental engineering, who taught geotechnical engineering at WPI for nearly four decades, passed away on May 15, 2023. He was 91.

Sage received BS and MS degrees in civil engineering from Rutgers University before joining the WPI faculty in 1957. He later earned a PhD in geology at Clark University. With research and teaching interests in the structure and stability of soils (he was known internationally for his work in such areas as rock mechanics, the shear strength of soils, and the effects of frost on soil mechanics), he was instrumental in establishing WPI’s master’s and PhD programs in geotechnical engineering.

Sage was active as an artist throughout his career. His later work merged his interest in art and engineering by incorporating materials like glass, dental material, bone, and ancient rocks into expansive paintings and sculptures. In 2002 he published a book, *MetaForms and MetaNudes etcetera* (Sagama Publishing), to explain his unique ideas and processes.

He is survived by seven children, 11 grandchildren, eight great-grandchildren, a sister, and a brother. He was predeceased by his wife of 64 years, Pauline, and an infant daughter.

### Armand Silva, Ocean Engineer and Former Department Chair

**Armand Joseph Silva**, professor in the Department of Civil Engineering from 1954 to 1976 (including serving as chair starting in 1971), passed away on April 1, 2023, at age 91. A renowned ocean engineer, researcher, and professor, Silva held many interests, was devoted to family and friends, and led a vibrant, adventuresome, engaged, and fulfilled life. He enjoyed a long, successful career in civil and ocean engineering, contributing significantly to the fields during a period of emerging geologic theories, such as plate tectonics.

At both WPI and University of Rhode Island, where he held the title of professor emeritus, Silva was advisor to more than 40 graduate students. In his oceanographic research expeditions, he collaborated with Woods Hole Oceanographic Institute, Sandia National Laboratories, Scripps Oceanographic Institute, Office of Naval Research, and National Science Foundation.

### Robert Zalosh, Fire Protection Engineering Professor and Authority on Explosion Risks

**Robert Zalosh**, professor emeritus of fire protection engineering and a widely recognized authority on explosions, died on June 29, 2023. He was 78.

Zalosh received three degrees in mechanical engineering—a bachelor of engineering from the Cooper Union, an MS from the University of Rochester, and a PhD from Northeastern University. Early in his career, he joined Factory Mutual Research Corporation (now FM Global), where he began his explosion research in earnest. Over the next 15 years, he rose to become assistant vice president and manager of the Applied Research Department.

While at Factory Mutual, Zalosh began teaching in WPI’s Fire Protection Engineering program, becoming a full-time professor in 1990 and retiring in 2006. In an addition to his teaching and research, he founded a consulting practice, Firexplo, through which he performed explosion hazard and risk assessments for industrial facilities, conducted numerous investigations of coal dust, natural gas,

hydrogen, and other kinds of explosions, and served often as an expert witness.

He frequently provided pro bono consulting to the fire departments in Boston and New York City. In 2016, the Boston Fire Department presented him with the Commissioner’s Award for Outstanding Civilian Service. A fellow of the Society of Fire Protection Engineers and the American Institute of Chemical Engineers (AIChE), he served as a member of the fire council of Underwriters Laboratories and the AIChE’s Hydrogen Safety Panel.

He wrote two textbooks, *Industrial Fire Protection Engineering* (2003, Wiley) and *Explosion Dynamics: Foundations and Practical Applications* (2023, Wiley, with WPI professor Ali Rangwala), and co-authored the Center for Chemical Process Safety’s *Guidelines for Safe Handling of Powders and Bulk Solids*.

He is survived by Gloria, his wife of 57 years, sons Michael and Matthew, four grandchildren, a sister, and five nieces and nephews.



### Pioneering Professor **Helen Vassallo**

**Helen Guillette Vassallo**, former professor of management and the second woman to be named full professor at WPI, passed away on June 9 at the age of 91. She served as head of the Management Department from 1989 to 1995, was the longtime chief justice of the Campus Hearing Board, and received the Trustees Award for Outstanding Teaching in 2003. She was recognized as National Sorority Advisor of the Year in 2005, belonged to the President's Council for the Advancement of Women and Minorities, and received the Woman of Consequence Award from the City of Worcester in 2008. In 2013, she was honored with the Goat's Head Lifetime Commitment Award from the WPI Alumni Association. She was also the first woman to be elected secretary of the faculty, the highest faculty post, in 2009.

She raised 10 children, three of whom are WPI alumni; she authored numerous articles, two books, and one monograph; and she held two patents. Along with her impact on the university, she also touched many people who crossed her path.

Vassallo joined WPI's management and biology and biotechnology departments in 1982 after a distinguished career as an educator,

researcher, and business leader in the fields of physiology, pharmacology, and anesthesia. She received a BS from Tufts University and an MS in pharmacology from Tufts University Medical School and then taught at Tufts, Brandeis University, Clark University, and WPI before joining Astra Pharmaceutical Products, where she would ultimately become director of scientific and professional information. While at Astra, she completed a PhD in physiology at Clark and an MBA at WPI, and was a visiting fellow and special student at MIT's Sloan Institute, where she studied organizational behavior. She was a member of the Skull Class of 1987.

Well-known for her energy and creativity as well as for her thoughtfulness and compassion, she loved to travel. She looked back at her time spent working with students at WPI project centers—San Francisco and Denmark—as among her most cherished university memories because she witnessed students adapt and grow in new places.

*Adapted from a story written by Lauren Borsa-Curran upon Vassallo's retirement in 2019.*

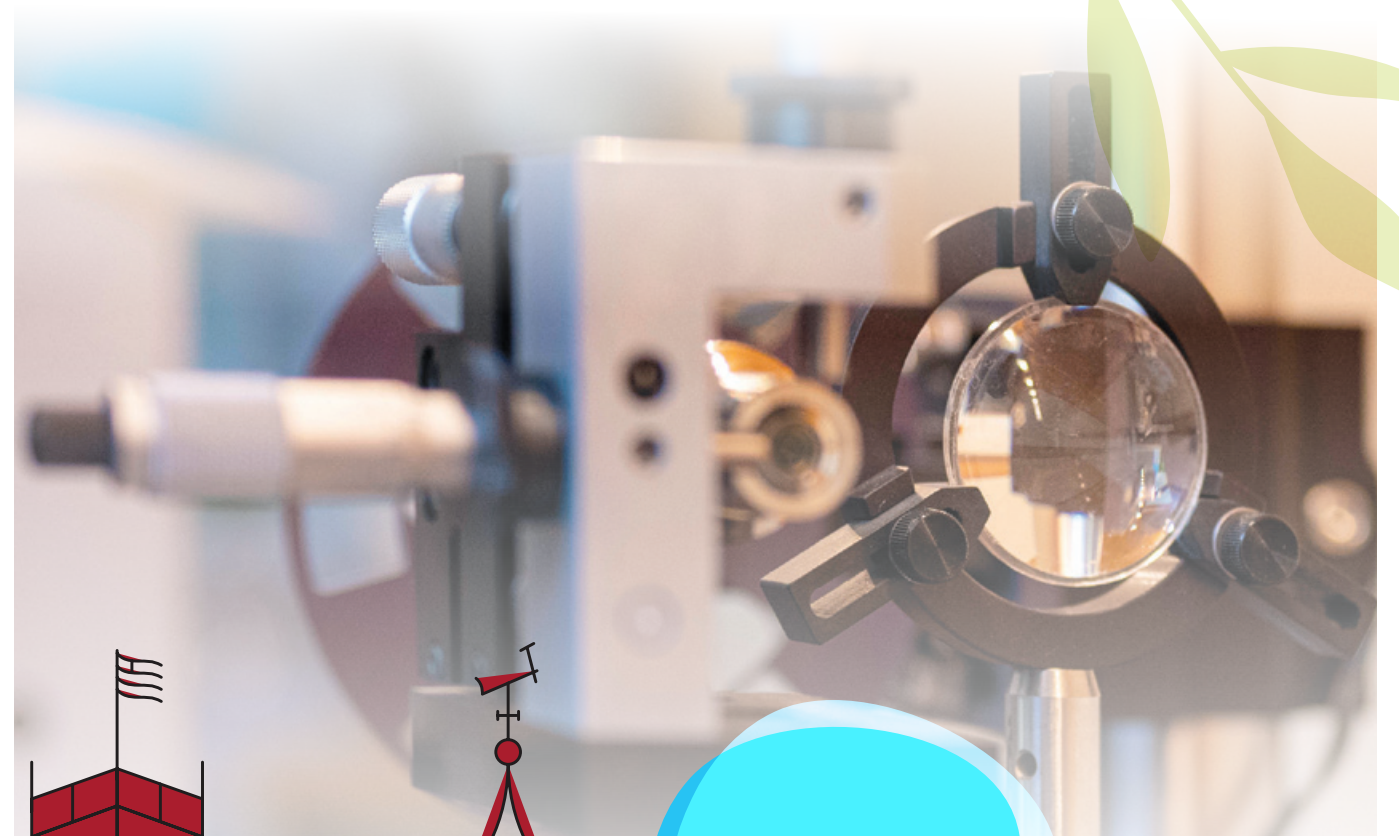
**Donald Girard '46 ME**, PHI KAPPA THETA, San Juan, P.R.  
**Delbert Walton '46 EE**, Port Charlotte, Fla.  
**George Johnson '48 ME**, SIGMA ALPHA EPSILON, Brevard, N.C.  
**Donald Fitzgerald '49 CHE**, PHI GAMMA DELTA, Estero, Fla.  
**Howard Tinkham '49 ME**, THETA CHI, Mattapoisett, Mass.  
**Paul O'Neil '52 CHE**, PHI KAPPA THETA, Glen Mills, Pa.  
**Harold Lake '54 ME**, ALPHA EPSILON PI, Newton, Mass.  
**Marshall Levine '55 ME**, ALPHA EPSILON PI, Wayne, Pa.  
**Richard Basil '56 ME**, PHI GAMMA DELTA, Chatsworth, Calif.  
**David Gilda '56 ME**, SIGMA ALPHA EPSILON, Macungie, Pa.  
**Frederick Lindsey '56 CHE**, PHI KAPPA THETA, East Haven, Conn.  
**Douglas Bryant '60 CHE PhD ME**, PHI SIGMA KAPPA, Delray Beach, Fla.  
**Leonard Marcotte '60 ME**, Orrs Island, Maine  
**Joseph Calzone '61 EE**, SIGMA ALPHA EPSILON, Marco Island, Fla.  
**Richard O'Shea '61 PH**, ALPHA TAU OMEGA, Holliston, Mass.  
**Hubert, Cole '62 ME**, THETA CHI, Bel Air, Md.  
**David Bova '63 CE**, TAU KAPPA EPSILON, Stoughton, Mass.  
**Thomas Donegan '63 EE**, PHI GAMMA DELTA, Woodbury, Conn.  
**James McKenzie '63 ME**, Bellevue, Wash.  
**Thomas Owens '63 ME**, PHI SIGMA KAPPA, Auburn, Mass.  
**Sterling McFee '64 ME**, Perrysburg, Ohio  
**Edward Johnson '66 EE**, Middleburgh, N.Y.  
**Arthur Amend '67 MS PH**, Brookfield, Conn.

**John Downes '67 ME**, SIGMA ALPHA EPSILON, Oscoda, Mich.  
**Wayne Garth '67 EE**, ALPHA TAU OMEGA, Penn Valley, Calif.  
**James Manning '67 ME**, ALPHA TAU OMEGA, Cornville, Ariz.  
**Robert Davee '69 SIM**  
**Robert Ahern '71 CE**, ALPHA CHI RHO, Avon, Conn.  
**Patrick Romano '71 CHE**, Sturbridge, Mass.  
**Frederick Paris '73 ME**, PHI KAPPA THETA, Wilbraham, Mass.  
**John Downes '78 CHE**, ALPHA CHI RHO, North Scituate, Mass.  
**John Richie '78 LS**, West Boylston, Mass.  
**Joseph Zecco '80 SIM**, Shrewsbury, Mass.  
**H. Abladian '85 MS MG**, Westborough, Mass.  
**Scott Reed '88 MA**, West Wareham, Mass.  
**Tam Huynh '93 ME**, Penllyn, Pa.  
**Kevin Medeiros '05 EE**, Warwick, R.I.  
**Michael Perruccio '14 MIS, MS MIS**, ZETA PSI, Pelham, N.H.

The WPI community also notes the passing of these friends of the university: **Justin Corttis**, **Stephen Hemming**, and **Morris Tanenbaum**.

Complete obituaries can usually be found online by searching *legacy.com* or newspaper websites. The Alumni Office will assist classmates in locating additional information. Contact [alumni-office@wpi.edu](mailto:alumni-office@wpi.edu).

“We are grateful to the Gapontsev family for their support of our faculty and students. We are proud to honor the legacy of Valentin Gapontsev and his enduring commitment to the scientific community through this fund and the IPG Photonics Lab.” —**Bogdan Vernescu**, Professor of Mathematical Sciences, Vice Provost for Research



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# WPI

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GOMPEI GUARDS THE MODERN SWIMMING AND DIVING FACILITIES AT THE SPORTS AND RECREATION CENTER. READ ABOUT THE ORIGINAL POOL, DEDICATED IN 1926 AND NAMED FOR WPI'S SECOND PRESIDENT, HOMER FULLER, ON PAGE 19.