



FLY THE GREENER SKIES

Herman Wiegman '88 and Nathan Wiegman '15 help chart the course of electrical flight



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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. We ask that letters offer the reader's opinion without rancor. Letters that mock or insult will not be published. Opinions expressed do not necessarily reflect the views of WPI. Send your letters to wpjournal@wpi.edu.

Up until a few months ago, I knew very little about electric vertical takeoff and landing (eVTOL) aviation—planes powered by electricity that take off like a helicopter and then fly like a fixed-wing aircraft. And yet this seemingly futuristic idea may be the next big thing in transportation, the solution to environmental pollution caused by one of our most vital modern conveniences.

I learned plenty about eVTOL aircraft during a September visit to BETA Technologies, the Burlington, Vt.,-based aviation company co-founded by Kyle Clark and **Herman Weigman '88**. Photographer Dave Seaver and I enjoyed the gracious hospitality of Herman and his son, **Nate Weigman '15**, whose combined enthusiasm for pushing the boundaries of flight (and, more important, battery technology) is contagious. Writer Scott Whitney captures their journey nicely in the issue's cover story that starts on page 26.

One interesting perk of working at BETA—besides the company-funded lunch truck—is that any employee can take flying lessons from on-staff instructors, experienced former military and commercial pilots tasked with training and certifying the operators of BETA's new aircraft. Nate, who earned his helicopter pilot's license this way, offered to give me a bird's-eye view of Burlington in the company's conventionally powered training helicopter. Despite initial misgivings, I stepped out of my comfort zone, climbed aboard, and was rewarded with a breath-taking experience.

Wishing you peace, good health, and opportunities to step out of your own comfort zones in this new year.

—**Kristen O'Reilly**, Editor



PHOTO BY MICHAEL KOZLOWSKI



FEATURING **DONNA STOCK**,
Vice President of University Advancement

For the entire interview, visit wpi.edu/tjournal.



The brothers of Phi Gamma Delta fraternity, also known as Fiji, are excited to announce that we are moving forward with the complete replacement of our 122-year-old chapter house, located at 99 Salisbury St. The original house, affectionally known as "Old 99," was demolished on Oct. 28 to make way for a brand-new, 14,500 sq. ft. home for the chapter. A groundbreaking ceremony took place on Nov. 20, which was also the 130th anniversary of our chartering at WPI. Phi Gamma Delta was the first Greek letter fraternity at WPI in 1891.

The original chapter house was completed Oct. 1, 1899. It is one of the oldest continually operating fraternity houses in the country. Worcester contractor Joseph Vaudreuil built the 24-room home, which was designed by Worcester architects Fuller, Frost, and Delano, at a cost of approximately \$12,000—plus another \$2,000 for furnishings. The house doubled

in size with a major renovation in 1965, which added the famed sundeck. The difficult decision to rebuild was driven by engineering studies and the cost analysis of renovation and repair.

The new house will be a residential, colonial-style home on three levels and a basement, with 16 bedrooms to accommodate up to 40 live-ins. It will be built on the existing lot with similar footprint to the old house and will be equipped with full kitchen and dining facilities, and accessible study and social spaces. F.W. Madigan Company of Worcester will be building the new facility, which was designed by William J. Masiello Architect, also of Worcester. Several Fiji graduate brothers and Consigli Construction Co. assisted with the pre-construction planning. Funding for the new \$5 million home was secured in large part by the generous support of our alumni. It is expected to be completed in fall 2022. And, yes, the "Fiji rock" is staying. The hundreds of layers of paint on it hold decades of memories and stories.

Since 1891, the Pi Iota Chapter of Phi Gamma Delta fraternity at WPI has provided a sense of belonging, strong bonds of friendship, leadership, and success, and a means of giving back to WPI and the community. Several of our brothers serve the Institute in advisory roles and on the Board of Trustees. The undergraduate chapter has also been recognized with several fraternity awards for national performance. With new beginnings, the chapter will continue to give back and thrive in the modern college environment.

—**David C. Willens '09, '10 MS, '20 PhD**
Phi Gamma Delta Graduate Advisor

LL: Donna Stock, great to be with you to talk about the *Beyond These Towers* campaign. Talk a little bit about this campaign.

DS: Happy to do so and happy to be leading this effort and collaborating with so many partners around the globe as we look to elevate WPI's reputation and visibility, and secure the resources to go beyond these towers.

LL: What does the theme 'Beyond These Towers' mean?

DS: You did a great job at the Trustees meeting recently where you said, this is beyond our campus. In addition to bringing the world back to the WPI campus, we're also talking about the impact that alumni have made throughout the entire globe.

LL: The goal is \$350 million in philanthropy, and \$150 million in sponsored research for a total goal of half a billion dollars. I like the sound of that. Where are we in getting to that goal?

DS: When we had our public launch (on Oct. 28), we were three quarters of the way toward that goal. That's a significant accomplishment, and we're proud of where we are right now.

LL: Let's talk a little bit about why this is so important. What kinds of things are supported through the campaign? It's really about aligning with our strategic plan, right?

DS: The campaign is the underpinning of the strategic plan. Access and affordability are key areas, providing resources for students and lowering barriers through financial aid. We're focusing on undergraduate scholarships, which many of our alumni received themselves, and some have already paid it forward with gifts. Graduate fellowships are also important. Part of the campaign will provide stipends to allow

more students to travel around the globe without financial barriers. Also important is supporting the Great Minds Scholars, which encourages Pell-eligible students to attend WPI.

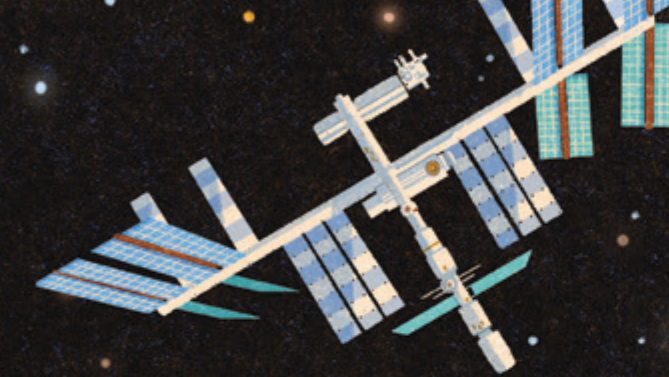
LL: Front and center is support of student well-being and mental health. Funding for the new Center for Well-Being is part of the campaign as well. Also facilities—the places where our students are learning, where our faculty are discovering. Tell us about the Alden Trust Challenge.

DS: The Alden Trust has been very generous to WPI over the years. The challenge is, if we raise \$20 million for facilities, then they will match that by \$5 million. And not just for our new academic building. It's also for any renovations that may happen across campus.

LL: For all the alumni who are reading and watching, what do we need from them in this campaign? How can they help us go beyond these towers?

DS: Our students are the lifeblood here, and they go on to be accomplished alumni. As we travel around and have conversations with alumni, they always give credit to WPI and the theory and practice that were the base of their education. We're asking our alumni to be those bridges to bring WPI's stories out into the greater world, and share the excitement of what we can do after the completion of this wonderful campaign.

At press time, we learned that President Laurie Leshin will depart WPI in mid-May to lead the Jet Propulsion Laboratory (JPL) and be vice president of Caltech, which operates JPL for NASA. Learn more here: wpi.edu/+LeshinNews and in the spring edition of the *WPI Journal*.



WILDFIRES AND MICROGRAVITY

EXPERIMENT ON INTERNATIONAL SPACE STATION COULD HELP PREDICT THE SPREAD OF FLAMES.

For a better understanding of how fire behaves on Earth, WPI researcher James Urban is looking, oddly enough, to outer space. Specifically, Urban is using the microgravity conditions on the International Space Station (ISS) to better understand how non-steady flame behavior causes wildfire to spread. In microgravity the non-steady behavior can be controlled instead of being driven by Earth-based forces such as gravity.

Urban, assistant professor of fire protection engineering, and his team will work on a study funded by the National Science Foundation and sponsored by the ISS U.S. National Laboratory.

As the study's principal investigator, Urban says the unpredictable nature of fire is attributed to many variables; being able to remove some of the most influential variables allows for a clearer understanding of fire behavior. The pressing need for this research is evident in the recent and ruinous wildfires that have cost lives, left scorched stretches of land, and destroyed astronomical amounts of property around the globe.

"The ultimate goal is to reduce the loss of lives, structures, and the danger posed to responders," Urban says. "If we have a deeper understanding of the physical processes driving wildfires, we can recreate hypothetical wildfire situations and design communities to be more resilient against them. We can better predict under what conditions we can do safe, controlled burns. And when we do have extreme fires, we can better predict how the fire is going to behave and allocate resources appropriately."

Urban's team will take a multipronged approach to understand fire behavior involving experiments on the space station and in WPI's labs. Researchers are seeking ways to understand what variables contribute to a fire's movement, spread, and increased intensity.

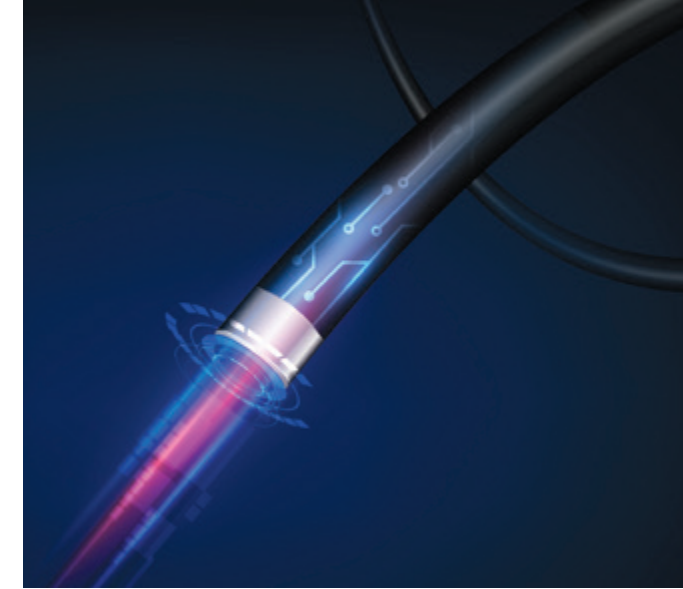
"Right now, our ability to develop a physical wildfire model and use such a model to predict what an active wildfire will do in a useful timescale is very limited," Urban says. "By understanding how flames behave on a smaller scale, we can gain insight and apply that to wildfire behavior."

To do that, the ISS offers an exceptional opportunity. In the microgravity environment, the typical and unstable effects of gravity on earth—including gravity-driven buoyancy flow (e.g., hot flame gases rising)—are removed. Urban's team plans to simulate non-steady flame behavior seen in wildfires, but in a controlled fashion by dynamically changing wind speed for experiments inside a miniature wind tunnel. By controlling the non-steady flame behavior, researchers can investigate the dynamic flame behaviors to more accurately forecast potential fire spread in a natural environment.

"One of the best ways to solve really hard problems is to solve similar, easier problems first," Urban says. "Here wildfire behavior is the hard problem, and I hope that this project turns out to be one of those easier problems that made understanding wildfires more manageable."

—Julia Quinn-Szcesuil

ILLUSTRATION BY QIAN LING



A NEW CHOICE IN TREATING YOUR VOICE

WPI researcher **Loris Fichera** has developed a flexible, slimmed-down robotic laser probe for endoscopic larynx surgeries that could reduce recovery time for patients and cut health care spending by shifting procedures from hospitals to doctors' offices.

The prototype probe's thin optical fibers and bendable design allow it to reach small folds of tissue that existing rigid instruments cannot reach, which could expand the number of patients whose larynx pain and conditions could be treated with minimally invasive procedures rather than general surgery, says Fichera, assistant professor in the Department of Robotics Engineering. Fichera is developing the new laser probe under a \$438,939 two-year National Institutes of Health grant.

"Viruses, injuries, and overuse can damage vocal folds in the larynx, leading to benign nodules or lesions," Fichera says. "These growths can be removed in the clinic with lasers that are guided into the throat, but surgeons need thinner, more flexible tools so they can perform more of these procedures in their offices and keep patients out of the hospital."

Fichera's robotic laser probe is a hollow tube that measures 1 millimeter in diameter and is made from an alloy of nickel and titanium. Laser-cut notches in the tube allow it to bend. Running through the tube are thin optical fibers and a pull wire to steer the device. The robotic probe can be integrated with existing medical endoscopic systems, providing images to the surgeon operating the device.

Fichera and undergraduate WPI students have used computer simulations of human larynxes to develop the probe prototype and are currently testing it on plastic larynx models. WPI is seeking a patent on the technology.

Fichera focuses on using robotics and computer science to improve medical procedures. WPI researcher Yuxiang Liu, assistant professor in the Department of Mechanical Engineering, and Thomas Carroll, MD, assistant professor of otolaryngology at Harvard Medical School, are collaborating on the robotic laser probe project.

—Lisa Eckelbecker



FROM LEFT, WICYs OFFICERS SHANNON TRUONG, ALEXA FREGLETTE, NICOLE CONILL, AND MIRA PLANTE

STUDENT GROUP ENCOURAGES MORE WOMEN TO CONSIDER CYBERSECURITY

Cybersecurity is facing two significant workforce issues—a gender gap and widespread vacancies. According to the 2020 Women in Cybersecurity report, women working in the field account for 24% of its overall workforce, up from just 11% in 2017. There are also reportedly 500,000 open cybersecurity positions in the United States.

As a way of addressing these two issues, students at WPI created a chapter of Women in Cybersecurity (WiCyS), a national organization with a goal of encouraging girls and women to enter the computer science fields. Since 2019, WPI WiCyS has facilitated team and individual coding exercises, guest speakers, and mentorship programs for young women interested in cybersecurity.

WPI WiCyS President **Nicole Conill '22** says she “fell in love” with the concept of women in cybersecurity after attending the national WiCyS conference in 2019. Soon after returning to campus, she and another student decided to start their own chapter of WiCyS. At first, Conill says, she viewed the club as a way to boost her résumé. When she became more invested in the club, she realized it opened many career opportunities, in addition to providing a way to give back to others. Now she has been “traveling and meeting people [in the field] all the time, every year” both on and off campus.

While the club is academically and technically focused, some of its greatest strengths may be in empowerment and representation. WPI WiCyS Vice President **Alexa Freglette '22** says she first became interested in cybersecurity in high school and joined WiCyS during her sophomore year at WPI. Freglette says she has benefitted from taking part in the club and is already hoping to pay it forward: “It’s exciting to be at the forefront of [cybersecurity], and I hope to inspire future generations of women and girls as they pursue their dreams.”

—Jack Levy

Mentorship, networking, and career guidance are important aspects of the club that may run counter to the stereotype of a solitary cybersecurity professional, according to Craig Shue, associate professor in the Department of Computer Science.

“There’s actually a friend group in this discipline, a group of people who want to help [these women] and see them succeed,” he says. In addition to giving a boost to the students already studying computer science and cybersecurity, having more women in the classroom and at WiCyS events encourages others looking to get into the field.

Both Conill and Freglette will be at WPI for an additional year to pursue their MS in cybersecurity. But their involvement and attachment to WiCyS likely won’t end there. As Conill says, “It’s almost a lifelong organization.”

QUOTABLE

“With very little notice, our volunteers and friends at WPI really stepped up to help us meet the needs of our families. We consider ourselves so fortunate to be rooted in a community that cares for its neighbors.”

—**Stacey Forrest**, chief operating officer at Thrive Support and Advocacy, offering thanks to members of Theta Chi Fraternity and students from ACCESS, a disability advocacy group, who—after learning that double the usual number of Thrive families needed help—set up a donation table in the Campus Center to collect food for Thanksgiving meals.

NIH-FUNDED RESEARCH INVESTIGATES STRESS FRACTURES IN FEMALE RUNNERS

Researcher **Karen Troy**, professor in the Department of Biomedical Engineering, has been awarded a \$462,645 grant by the National Institutes of Health to determine the role that muscle and bone strength play in stress fractures in the feet of female runners.

Troy’s three-year project will combine mechanical testing, computational modeling, and analysis of the feet of 45 female runners, including some teenagers, to identify factors involved in injuries to foot bones known as metatarsals.

“Bone stress injuries, more commonly known as stress fractures, to the feet are common in female runners, and some of these runners are repeatedly injured, even after they undergo medical treatment, change their shoes, and alter the way they run,” Troy says. “A better understanding of the way that muscle and bone interact to produce these injuries could lead to recommendations that would help doctors and patients assess risk factors for injury and design more effective treatment plans.”

Troy, whose research focuses on the interactions between physical activity and musculoskeletal health, disease, and injury, is principal investigator on the project. Co-investigators are Irene Davis, professor, and Adam Tenforde, associate professor, at Harvard Medical School. Davis is founding director of the Spaulding National Running Center at Spaulding Rehabilitation Hospital in Cambridge, Mass., and Tenforde is the running center’s director of running medicine.

Metatarsals are long bones in the foot’s mid-section that form the foot’s arch and work with muscles, ligaments, and tendons to produce the foot’s movement. Stress fractures occur when a bone sustains repeated, low-magnitude forces that the body cannot repair, either because the micro-injuries accumulate too fast or the body’s responses are impaired.

The researchers will use data simulations, computer imaging, mechanical fatigue testing, and scans of female runners’ feet to determine how strengthening weak foot muscles may modify the risk of bone stress injuries.

“At the end of the research project, we want to have useful advice for clinicians so they can identify runners who, either because of their foot anatomy or other characteristics, are at high risk of bone stress injuries,” Troy says. “The ultimate goal is to prevent repeated injuries.”

—Lisa Eckelbecker

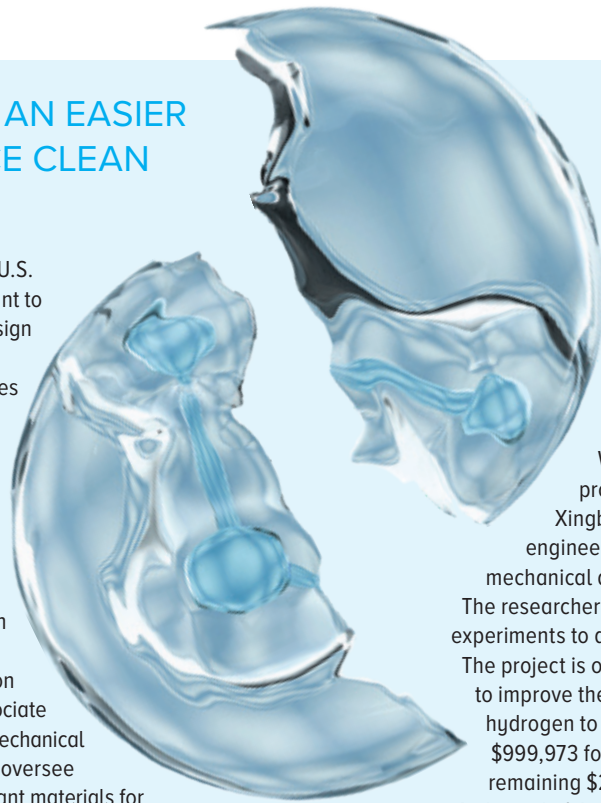


SEARCHING FOR AN EASIER WAY TO PRODUCE CLEAN HYDROGEN

Yu Zhong has been awarded a U.S. Department of Energy (DOE) grant to lead a \$1.2 million project to design better-performing materials for devices that split water molecules to produce clean hydrogen fuel. Expanded production of hydrogen, which is currently used mostly in industrial applications, is of significant interest as nations worldwide grapple with climate change and seek ways to reduce carbon emissions from fossil fuels.

Zhong, principal investigator on the two-year project and an associate professor in the Department of Mechanical and Materials Engineering, will oversee development of chromium-resistant materials for oxygen electrodes that are used in solid oxide electrolysis cells (SOEC). SOECs, which are powered by electricity and stacked into large configurations, to break water into oxygen and hydrogen.

Although fossil fuels such as natural gas are used to generate most of the hydrogen produced worldwide, improved SOECs have the potential to expand hydrogen production without carbon emissions by using electricity from renewable energy sources, such as solar and wind power, to produce hydrogen that can be stored for later use.



“The performance of oxygen electrodes in SOECs drops over time mainly as the oxygen electrodes, which are made of ceramic materials, are exposed to chromium impurities in air,” says Zhong, whose research focuses on integrated computational materials engineering (ICME). “Better electrode materials that resist chromium poisoning would lead to SOECs that could operate longer without a significant drop in performance, and that would make SOECs a more cost-effective way to produce hydrogen.”

Zhong will collaborate with three co-PIs at West Virginia University: Wenyuan Li, assistant professor of chemical and biomedical engineering; Xingbo Liu, professor of mechanical and aerospace engineering; and Edward Sabolsky, professor of mechanical and aerospace engineering.

The researchers will use computational modeling and laboratory experiments to develop optimal materials for oxygen electrodes. The project is one of 12 funded with \$16.5 million in federal funds to improve the production, transport, storage, and use of hydrogen to reduce carbon emissions. The DOE will provide \$999,973 for Zhong’s project; the universities will fund the remaining \$250,785.

At the end of the project, the researchers will recommend materials for testing by Saint-Gobain Research North America in Northborough, Mass., an industry partner.

“Hydrogen is the cleanest fuel, and in the future the world will use more hydrogen,” Zhong says. “That makes our task to improve the performance of SOECs urgent, so that these devices can last for many years.”

—Lisa Eckelbecker

SUMMER LAB PROGRAM AIMS TO IMPROVE WORCESTER’S K-12 STEM EDUCATION

WPI will launch a summer program in 2022 with the goal of improving high school science, technology, engineering, and mathematics (STEM) education in high need Worcester-area schools by immersing current and prospective teachers in research at WPI laboratories.

A \$599,980 grant from the National Science Foundation will fund the three-year project, which will begin recruiting both “pre-service” and “in-service” teachers in early 2022 from schools in Worcester and Leominster, Mass. Established teachers will be paired with WPI students who are preparing to become teachers, and together they will work with WPI faculty members to research solutions to sustainable development goals identified by the United Nations.

Erin Solovey, an assistant professor in the Department of Computer Science who is affiliated with the Learning Sciences and Technologies program, is principal investigator (PI) on the project; co-PI is **Katherine Chen**, executive director of WPI’s STEM Education Center.

“It’s difficult for teachers to obtain the authentic STEM research experiences that can be integrated with curriculum in classrooms,” said Solovey, whose research focuses on human-computer interaction. “This program will provide those experiences, which will enable current and future teachers to better prepare diverse students for further education and careers in STEM, while also demonstrating to students how engineering can solve global challenges.”

Five teachers and five WPI students per year will participate in the six-week sessions, for a total of 15 teachers and 15 students over three years.

Participants will work with WPI faculty members whose research addresses United Nations goals such as ending hunger, ensuring education for all, increasing access to renewable energy, promoting infrastructure, and working toward sustainable production and consumption of goods. Teachers and students will have opportunities to research food safety sensors, brain activity during learning, conversion of food waste to energy, underwater adhesives, and other engineering advances in WPI laboratories.

—Lisa Eckelbecker

Leave your mark

Centennial Walkway

The Centennial Walkway on the Quad has become one of WPI’s valued traditions. Purchase a brick with your name or the name of a loved one to always be part of the campus. All bricks ordered by February 28 will be installed prior to Commencement.

wpi.edu/+bricks



WPI

Elliott P. Eno
2006

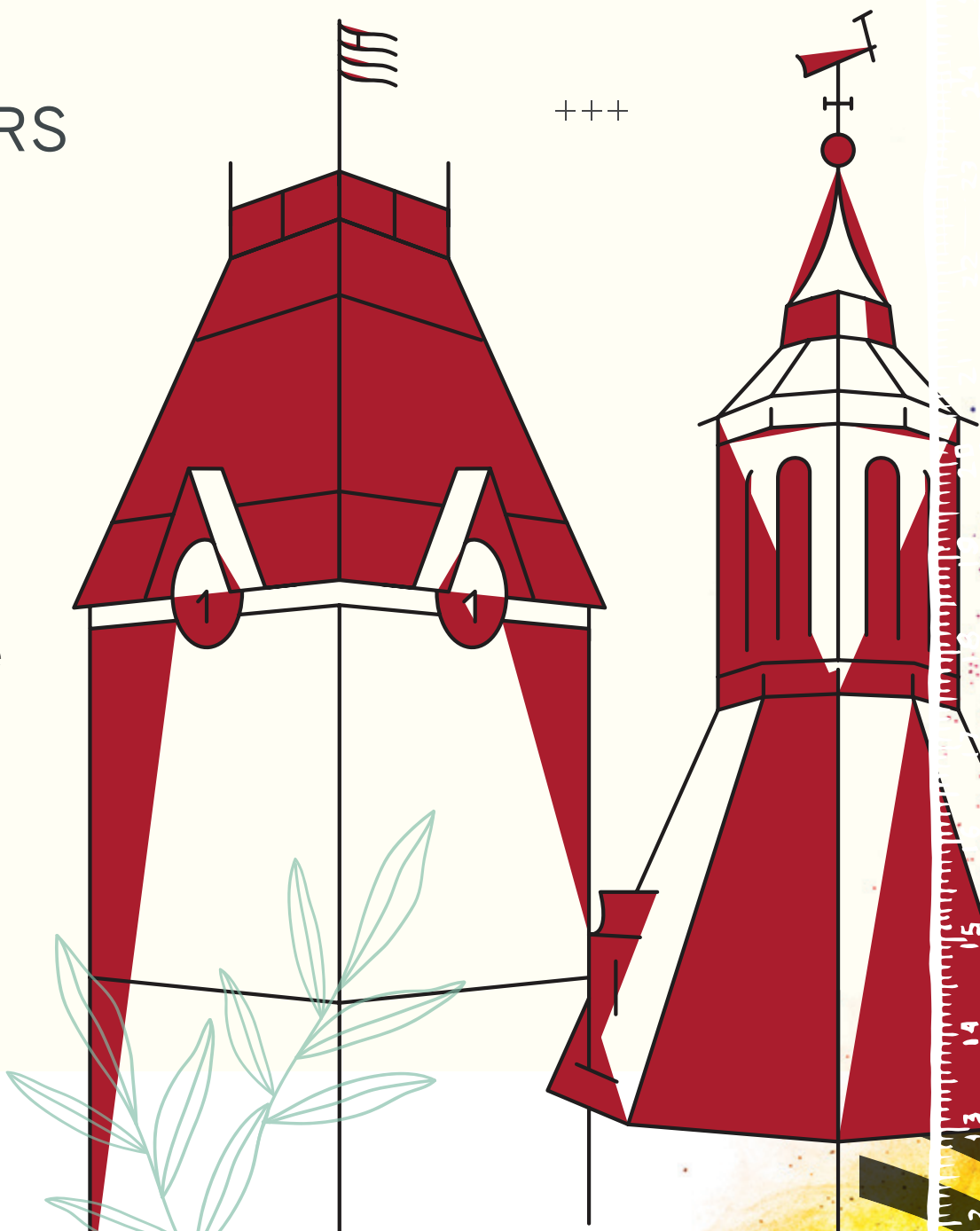
\$500 Million Fundraising Campaign Launches Publicly

BEYOND THESE TOWERS

THE CAMPAIGN FOR WPI

Historic effort in philanthropy and sponsored research affirms WPI's commitment to solving global problems by combining theory and practice.

WPI launched "Beyond These Towers," the largest fundraising campaign in its history—and the first to combine philanthropy and sponsored research—at a global virtual event on Oct. 28, 2021. University leaders announced they had already raised \$354 million toward a \$500 million goal.



The campaign, now entering its public phase, positions WPI to continue to transform lives, to turn knowledge into action to confront global challenges, and to revolutionize STEM through its distinctive and inclusive education, projects, and research. The campaign's theme is a nod to the towers of WPI's first two buildings, enduring symbols of its guiding philosophy of theory and practice.

"Since WPI's founding, theory and practice have led generations of students, faculty, and staff to apply their acquired skills, knowledge, and abilities to help co-create solutions to great problems around the world," said President Laurie A. Leshin. "Through this campaign we are reaffirming our commitment to lead with purpose, to stay true to our core, and to advance our highest aspirations that our work—as scientists and engineers, business leaders and humanists—has a meaningful impact on people, society, and the planet."

Leshin and George Oliver '82, chairman and CEO of Johnson Controls, WPI trustee, and national campaign chair, hosted the event. Attendees from around the world learned from WPI students, alumni, and faculty about the campaign's goals to fund strategic initiatives in four areas:

• Tomorrow's Leaders: \$100 million for undergraduate scholarships and graduate fellowships to make a WPI education more accessible to a more diverse population of talented students; for academic and student life programs, including a planned WPI Center for Well-Being; to prepare graduates to navigate life's challenges and thrive as they make a positive difference in the world—as students and as alumni.

• Globally Engaged University: \$50 million for The Global School and its initiatives, including WPI's unique network of Global Project Centers; The Global Lab, a collaborative space for students, faculty, staff, visiting scholars, postdocs, and partners to interact, imagine, and visualize ideas using state-of-the-art media studios; and programs to expand and deepen WPI's capacity to create positive change, globally and locally.

• World-changing Research: In addition to securing \$150 million in sponsored research, \$100 million in philanthropy for graduate fellowships, endowed faculty chairs, graduate programs, and the dynamic research ecosystem that fuels WPI's national and international reputation and is ultimately aimed at solving critical problems and improving lives.

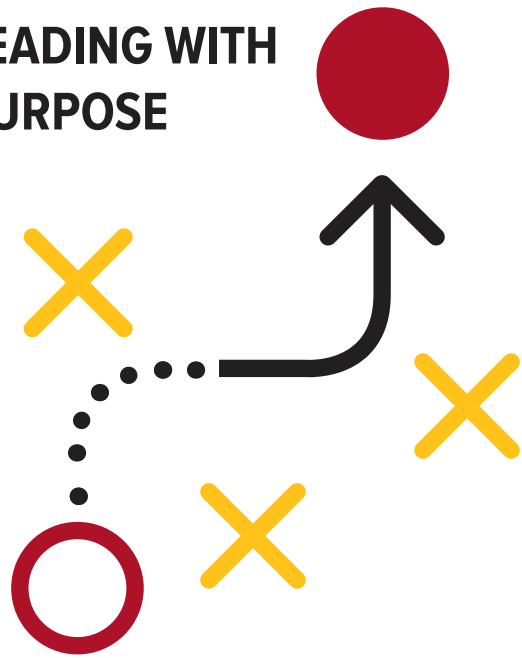
• Innovative and Inclusive Community: \$100 million to support faculty, students, staff, and programs that ensure that our students graduate with entrepreneurial mindsets and learn how to create value; that our community is supported in its pursuit of excellence in all things; and that we are building an inclusive, supportive, and welcoming community where all members feel a strong sense of belonging and have the opportunity to achieve their full potential.

"These aspirations are high—but that's what this campaign is about: WPI has never been a community content with complacency, and 'good enough' has never been good enough for us; we have always sought better solutions, brighter futures, and expanded universes," said Leshin. "As with any great discovery or technological advancement, we cannot do it alone, and we're counting on the continued and intensified support of alumni, parents, friends, and partners to help advance the work of our students and faculty."

"This campaign is about what philanthropy can do for our faculty and students, and what they will do for people all over the world," said Oliver. "WPI faculty members, graduate students, and undergraduates are developing such forward-thinking solutions to such difficult global problems—problems that impact all of us—and by supporting 'Beyond These Towers' we are helping ensure they can continue to seek those solutions and continue making an impact."

For more information, visit: wpi.edu/+beyond

LEADING WITH PURPOSE



Aligned with the launch of *Beyond These Towers*, WPI unveiled this past fall its new strategic plan—a shared vision for the university over the next five years. Its framework emerged following a comprehensive and inclusive planning process and is focused on three broad areas: Student Access and Well-being, Purpose-driven Education and Research, and Our Inclusive Community.

Groundwork was laid in spring 2019 engaging students, faculty, staff, trustees, and alumni in feedback gatherings, a 120+ attendees Board of Trustees plenary session, and a survey sent to the community focused on crafting a new university mission, which set the tone for the plan:

WPI transforms lives, turns knowledge into action to confront global challenges, and revolutionizes STEM through distinctive and inclusive education, projects, and research.

Though planning was put on hold in spring 2020 due to COVID-19, efforts resumed in the fall with a working group that included representation from faculty governance, the four schools, and all divisions. In addition to a new mission statement, the plan is grounded in articulated values for WPI: Respect, Community, Inclusion, Innovation, and Achievement.

Cross-functional implementation teams will now work toward a set of defined goals and will track and regularly share key metrics with the broader community. All faculty and staff were invited to bring their passion and skills to the team to assure new perspectives and voices.

“To lead with purpose, we must boldly and creatively address critical external trends and issues—many identified before, and heightened by, the pandemic—that directly impact our students, our academic and research enterprises, and our community,” says President Laurie Leshin.

Read Lead With Purpose: 2021–2026 at wpi.edu/lead-with-purpose.

—Jessica Grimes

A Youth Mental Health Crisis, and the WPI Response

President Laurie Leshin convened the Mental Health & Well-Being Task Force in September to advance WPI’s goal of creating a campus centered on mental health and well-being. The group serves as a critical augmentation of work already under way, guided by the strategic plan, to take a holistic and inclusive approach to elevate student well-being across academic and co-curricular experiences, including launching the WPI Center for Well-Being.

Nationally, feelings of disconnection, fear about the future, hopelessness, and increased anxiety are more common than ever, especially among the college-age population. Students are grappling with increased stress and anxiety that has only been exacerbated by the pandemic. Some students’ existing mental-health challenges have worsened during COVID-19, while other students have experienced such concerns for the first time. At WPI, the community is dealing with six student deaths, three of which are known to be by suicide, since July.

These losses are unprecedented in the university’s history. Between 2006 and June of 2021, WPI saw a total of two deaths by suicide. Prior to 2006, when many of WPI’s most effective suicide prevention efforts began, the university’s suicide completion rates were on the national average (6.5-7.5 per 100,000 students, which translates to one every three years). Up until this year, that rate had dropped to well below the national average.

To gain greater insight into specific factors that impact mental health and identify opportunities to address those factors, the task force gathered significant community input via 16 town hallstyle listening sessions open to undergraduate and graduate students, staff, faculty, alumni, and parents; a qualitative survey that garnered more than 1,100 responses; and other avenues.

Co-chaired by Jean King, Peterson Family Dean of the School of Arts & Sciences, and Matthew Barry, associate director of the Student Development and Counseling Center (SDCC), the 35-member task force of students, faculty, and staff will build a foundation for strengthening mental health and well-being resources for the campus community and helping students develop the life skills needed for success at WPI and beyond.

INITIAL ACTIONS TAKEN:

- Hosting the first Be Well Together Day for students, faculty, and staff
- Hiring additional staff in the Student Development and Counseling Center
- Augmenting WPI’s Counselor-on-Call system with an after-hours telehealth service for students
- Launching an online system for booking SDCC appointments
- Fast-tracking the launch of the new Center for Well-Being

—Alison Duffy

See how WPI students put theory into practice through projects.

PROJECTS

SOLUTIONS FOR A GREENER SWISS TRUCKING INDUSTRY

THE STUDENTS

David Acuna '23, Jacob Mitchell '23, Ha Nguyen '23, Toni Vigliotti '23

THE ADVISORS

Nancy Burnham, Francesca Bernardi; Sponsor Organization: Designwerk

THE BACKGROUND

Climate change is a major concern around the globe, and the diesel-fueled freight industry is a significant polluter. Switzerland, one of the 196 countries that signed The Paris Agreement, promised to reduce the reliance of its economy on the burning of fossil fuels and the usage of nuclear power, replacing them with more renewable sources of energy. The goal of the project was to create a road map toward zero-emissions in the Swiss long-haul freight transport industry.

THE METHODOLOGY

The needs of major stakeholders (truck manufacturers, electricity suppliers, fleet owners, and operators) of the freight industry were surveyed through online interviews. The team also conducted a literature review of zero-emission technology. This research revealed two significant drawbacks of owning an electric fleet: range and charging time. Price was also a concern.

RECOMMENDATIONS

- The Swiss government must invest in infrastructure by adding chargers and improving the electrical grid. It should also offer private companies funding assistance to research battery and charging technology, using revenue raised from taxes on diesel trucks and fuel.
- The government should assist businesses transitioning to new technologies with joint educational conferences to help train the workforce to adapt to alternative-fuel infrastructures.
- Freight policies should favor zero-emission operations.
- Despite the current limitations, truck manufacturers should continue its research into batteries and charging technology.
- Future project: Conduct a cost-benefit analysis for switching to alternative fuel sources, which would give fleet owners a better understanding of the investment they are making and aid in their transition between technologies.

BUILDING COMMUNITY ON ALL LEVELS

Even as a child, **Kristophe Zephyrin '21** had grand ambitions to save the world and improve the human condition, starting with a dream of creating urban green spaces in his hometown of Houston, Texas. "I was a weird kid," he laughs. "There's concrete everywhere in Houston, so as a 14-year-old, I decided 'I'm going to build green spaces when I grow up.'"

He was drawn to the hands-on nature of civil engineering. "I hate being behind a computer; I like being around people, and civil engineers basically create change for people," says Zephyrin, who ended up combining his civil engineering major with a second major in environmental & sustainability studies. He is now a graduate student in the Science and Technology for Innovation in Global Development program, continuing his quest to solve global problems in innovative ways.

As an undergraduate, he was a member of the first group of students to travel to the Ghana Project Center, where teams focus on codesign, community development, and infrastructure. For his Interactive Qualifying Project, he helped to build bridges in the eastern region of Ghana, deliberately following the lead of local residents in formulating solutions.

"Being there was an eye-opening experience. As a Black person coming from America, I'd never been in a place where there's just Black people," says Zephyrin, who is of Haitian and Guyanese descent. "We were really developing community, helping them understand how they can further implement changes." Years of colonialism, where solutions from the Global North were imposed without local consideration, made it hard for native innovators and change makers to be successful.

"This is the type of work I really want to do. I want to go to a community and use my experience to bolster their knowledge. At the end of the day, they are the experts in their environment. I can't come to their home and say, 'You need to build it like this.' But I can use my engineering skills to work with them to develop new solutions."

His Major Qualifying Project experience in Guyana was even more transformational. Working with the East Demerara Water Conservancy, one of the main watersheds near Guyana's capital, Zephyrin developed a site plan for a research park. Eighty percent of the country's population lives on the coast, and climate change is manifesting more frequent, devastating floods. The project became the basis for his master's thesis, and he hopes to ultimately establish a new project center there.

"We want to educate the youth of Guyana not only about the risk of floods, but also about hydrology and natural sciences so they can work on problems in their own country," he says. Many Guyanese are educated, he says, "but they end up leaving the country because they may not see the value of staying. This project will provide a space for professionals to do actual research and help develop that research culture."

Zephyrin's passion for community building is also evident in his many activities outside the classroom—from helping promote fellow fashion lovers through his photography and brand-building skills, to investigating

INSIDER

KRISTOPHE ZEPHYRIN '21

PHOTO BY MATTHEW BURGOS

the Black experience at WPI as a research assistant. He is particularly proud of his work with Worcester's African Community Education, where he introduces young refugees to the field of engineering and helps develop their skills.

"It's crazy and inspiring for me to see someone who has been displaced still going out and doing great things in their new community. These students are thriving. They are doing so much with so little; they're pushing me to do better," he says.

This passion for service, instilled in him by his mother and his Aunt Miss—his grandfather's aunt whom he credits as the most influential force in his youth—led him to a significant achievement: Being inducted as Worcester's first and only brother of Alpha Phi Alpha Inc, the first intercollegiate, historically African American fraternity, whose members include Martin Luther King, Thurgood Marshall, and Cornell West.

According to its mission statement, Alpha Phi Alpha Fraternity, Inc. "develops leaders, promotes brotherhood and academic excellence, while providing service and advocacy for our communities." The initiation process is intense, involving extensive tests that require 90 percent pass rates, but Zephyrin is working with other recruits in hopes of establishing a chapter at WPI.

"We take our brotherhood very seriously. Once you are a member, you are a brother of Alpha for life," says Zephyrin. "I'm ambitious and I have a lot of things on my plate, and Alpha supports me through all of it. We push each other. I was just talking to one of my brothers, and he said, 'I just got my PhD. When are you getting yours?'"

—Kristen O'Reilly

WITH UNIVERSITY LIBRARIAN ANNA GOLD

How has the library adapted to the needs of the WPI community during the pandemic?

When the campus closed down in early 2020, the WPI community dispersed. The only way we could offer information and services was digitally. Fortunately, we were in a great position to do that. We had a deep portfolio of digital information, and we added even more, especially materials needed for remote teaching. Library instruction, research services, and outreach went online. So did WPI's annual Sustainability Project Competition—and we had a record number of submissions. One librarian, Robin Benoit, took her twice-weekly mindfulness meditation sessions online and they continue to this day. When we returned to campus last spring, we reorganized our study spaces to ensure users felt safe and welcomed. The pandemic experience changed us all and taught us so much.

What is the Digital Scholarship With Purpose initiative all about?

The Black Lives Matter (BLM) protests prompted us to ask: How can we reinvest our skills, space, and time to create sustained support for Diversity, Equity, and Inclusion (DEI) across all the library's services? One answer was Digital Scholarship With Purpose—our plan to reinvent the Shuster Lab for Digital Scholarship as a place where people with common research interests in DEI and sustainability can make connections and find inspiration together. Digital technologies and techniques can help us ask new questions, document marginalized voices and experiences, and interrogate accepted narratives through research and analysis.

Our initiative was one of seven selected nationally for a LYRASIS Catalyst Fund Grant.

We're thinking about whether our library—and other libraries—could offer a DEI research consultation service, designed specifically to help students bring DEI and sustainability lenses to their projects and research by exploring new information and scholarly techniques.

How has the Shuster Lab grown since its creation in 2018?

One of the programs we piloted after the Shuster Lab opened is Digital Volunteers. The volunteers meet once a month to do things like increasing the Wikipedia presence of underrepresented people in STEM. Starting in C-Term (January 2022), the lab is planning to start hosting informal meet-ups to share research as well as techniques, and then we'll share highlights through our website. We're also planning to invite organizations and people who are doing exemplary work in DEI and sustainability using digital scholarship to visit us remotely. The pandemic helped us see how relatively easy this is to do!

We'd also like to offer use of the lab's high-end scanners and digital archiving expertise to empower community-based archiving projects, whether by WPI students or by other Worcester-area community groups and organizations.

What are Open Educational Resources, and why should we care about them?

Open Educational Resources (OER) are materials teachers create and make available free to students and the world. They can be anything from a syllabus to a video module to a complete course textbook. A surprising number of students don't buy required textbooks today; our data shows that many WPI students don't buy all required textbooks. Those who do, may have to go without meals

to afford textbooks—some cost \$250 or more. So, using OER reduces the cost of college for students and puts all students on a level playing field; everyone has the textbook!

There are other benefits, too: reusing and modifying OER resources can facilitate collaboration and innovation in teaching, and faculty can also incorporate diverse language and examples, creating more inclusive course materials that encourage STEM success for all students.

What other library initiatives make you proud?

- **Modernizing Gordon Library:** We've been expanding and redesigning our study spaces to meet student needs. We want to keep this momentum going and add even more seats and Tech Suites.
- **Digital WPI:** This is an invaluable resource for current students; it shares our student projects and research with the world. It also has over 150 years of WPI publications—a cultural and historical goldmine.
- **Our Charles Dickens collections:** The WPI Archives has rapidly become a destination for research on the work and world of Charles Dickens. Dickens is not only a literary giant, but his work offers extraordinary perspectives on social justice and the human impacts of technological revolutions.
- **Last but not least, celebrating our artists:** This winter we are exhibiting a beautiful collection of paintings by a WPI (ME) PhD student, Elif Asar. Sharing work by WPI's artists and authors is a special pleasure and privilege.

—Kristen O'Reilly

A PROJECT CENTER CLOSE TO HOME: BUILDING A FOREST CLASSROOM IN PAXTON

From Worcester, England, to Worcester, Mass.—it’s a catchy way to encapsulate the breadth of WPI’s Global Projects Program. Students have their pick of more than 50 project centers across six continents to complete their Interactive Qualifying Project (IQP).

But what about those who prefer to stay closer to home?

“Whether it’s because of on-campus responsibilities or a local job, not all students want to travel far [for their IQP],” says Lisa Stoddard, associate professor of teaching and director of the Farm Stay Project Center. “Regardless of where they go, we want all students to have the chance to experience the mainstay of a WPI education.”

Located in nearby Paxton, Mass., the Farm Stay Project Center is a collaboration with Turn Back Time, a nonprofit 58-acre farm and nature-based education center. Executive Director Lisa Burris originally started the farm to help support her two children, who struggled with challenging behaviors and needed a place to be themselves and learn without boundaries. The farm works with children ages 3–12, with a focus on supporting those who are in the foster care system, have experienced trauma, are neurodiverse, or struggle with behavioral issues in and out of the classroom.

After hearing about another local farm partnering with WPI for an IQP, Burris reached out and met with Stoddard; soon afterward, the project center began to take shape. Projects primarily focus on water management, renewable energy, climate resilience, organic food production, forest management, and learning opportunities for the farm’s visitors. Additionally, teams are expected to write a curriculum to pair with their project.

First-year students who are enrolled in Stoddard’s Great Problems Seminar course “Heal the World” also have the opportunity to explore the project center as part of their work, which is exactly how Minh Anh Kieu ’22 realized that it was the perfect place for her to complete her IQP.

“It was so large and lively with all the greenery and the animals—and children running around laughing,” recalls Kieu. Another special aspect of the project center was that it reminded her of her parents’ farm back in Vietnam. “I feel very connected to Turn Back Time’s mission to provide educational opportunities to children through natural exposure and exploration.”

Victoria Heffern ’23 agrees. “I had personally never heard of forest schooling, and the concept seemed very distinct,” she says. “We often solely think of traditional schooling methods, with maybe some outdoor STEM component, but never address the alternatives.”

Addressing the alternatives is exactly what Heffern and her team did with their project. What began as the development of a bridge system to cross over a muddy rainwater runoff area evolved into a forest classroom, featuring an area for research materials, hands-on interactive exhibits, magnifying stations, and places to sit down and read among nature.

“It’s a beautiful learning area,” says Burris. “They focused on what the children themselves wanted and needed in the space and created a functional outdoor classroom where they can be engaged for hours.”

In true WPI fashion, the project center has evolved from its initial scope. Thanks to over \$33,000 raised by the Class of 2020 as part of their Senior Class Gift, Turn Back Time was able to embark on a \$200,000 project to build a community yurt with kitchen, living, and dining space, a bathhouse, and three cabins, giving student teams the opportunity to live on site.

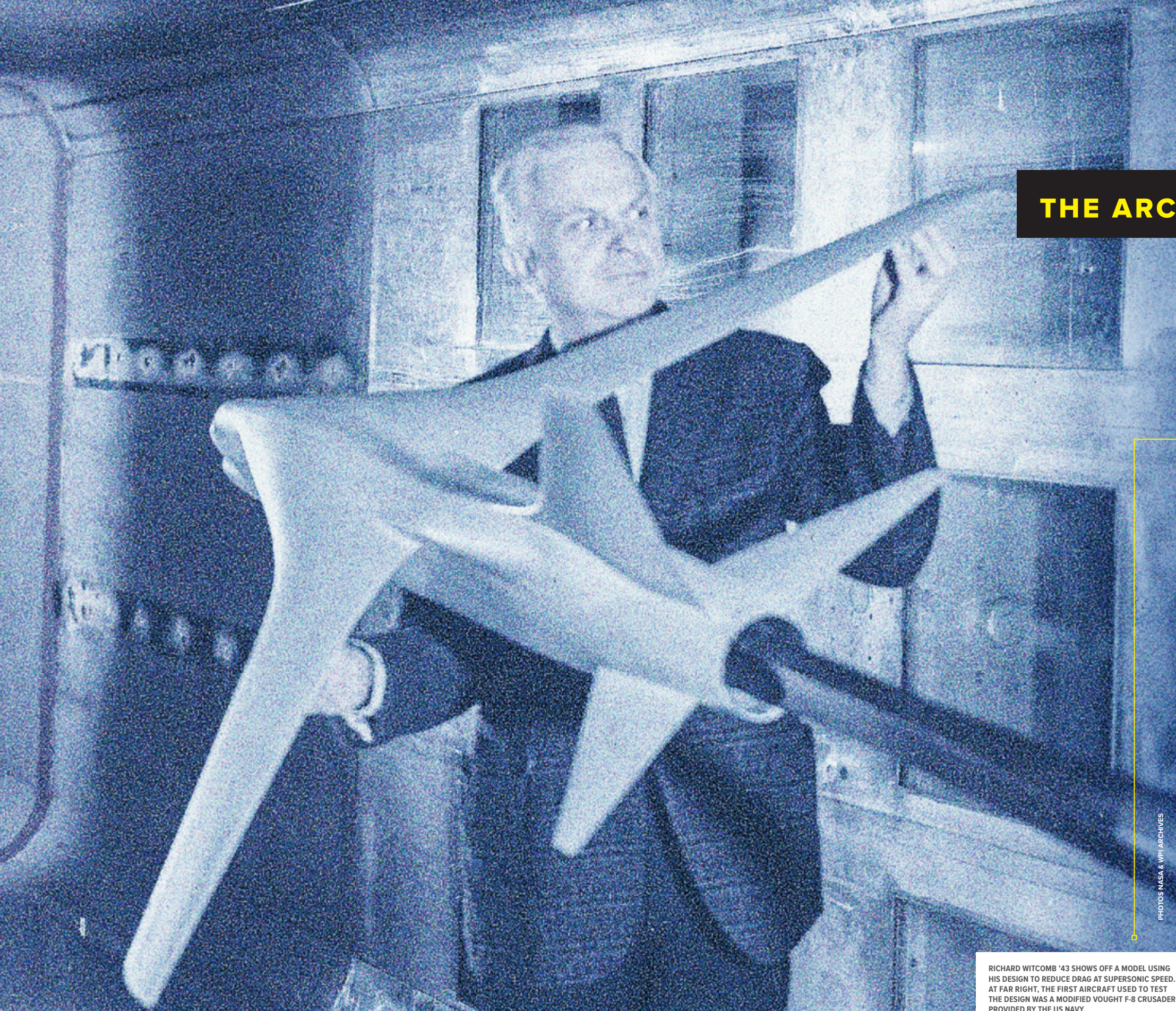
There’s much to enjoy while being immersed in the project center, but when asked what her favorite part of it all is, Stoddard has no trouble narrowing it down. “Seeing what makes each student come alive,” she says. “For some, it’s holding a bird for the first time ever. For others, it’s the chance to see the way their work is impacting the kids, or building something that’ll be a major part of the farm’s infrastructure. All these emotions come through learning, and it’s been great to see them shift from a strict classroom setting to tackling abstract ideas.”

—Allison Racicot

Access exclusive digital content—including videos of students in action—and learn more about this project center at [WPI.edu/+FarmStayJournal](https://wpi.edu/+FarmStayJournal).

GLOBAL IMPACT

THE ARCHIVIST | The Father of Winglets: Richard T. Whitcomb, Class of 1943



While a young boy growing up in Worcester, **Dick Whitcomb** could be found in the fields near his home launching and recovering rubber band-powered, balsa wood model airplanes. He was obsessed with watching as they glided through the air. Between flights, he would make modifications to help them soar higher and stay aloft longer, a lifelong passion that—years later—helped transform the entire field of aviation.

In the fall of 1939, Whitcomb enrolled at WPI as a member of the Class of 1943; he joined Sigma Xi, Tau Beta Pi, and the Aero Club, where he championed the concept of wind tunnels. He earned his degree in mechanical engineering, and after graduation accepted a position with NACA (the National Advisory Committee on Aeronautics), the predecessor to NASA (National Aeronautics and Space Administration), where he worked with the Langley Eight-Foot High Speed Tunnel. In 1952, he made the first of his three major contributions to aeronautics by radically altering the shape of aircraft fuselages to ensure a smooth cross-sectional area engineered to reduce drag at supersonic speeds. The area rule concept is now a critical design element of all modern high-performance aircraft.

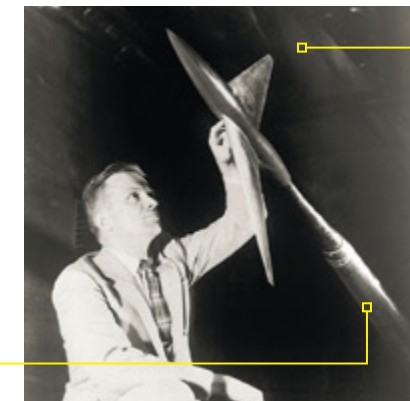
In 1969, he unveiled his newly designed supercritical wing. Featuring a thick, blunt leading edge, a flat top, and a bulging underside with a downward lip on the tail edge, this new wing reduced drag, which has saved billions of dollars in fuel cost and can be seen on nearly every commercial airliner. Taking inspirations from the natural world, he spent much of the 1970s incorporating his observations of birds and existing research on vertical stabilizers, introducing the concept of winglets, small vertical extensions on the outer tips of wings. These winglets further reduced drag and are now commonly found on modern military and commercial aircraft.

Among his many honors, Whitcomb was the youngest-ever recipient of an honorary degree from WPI when it was bestowed upon him in 1956 at age 35. He was also awarded the Collier Trophy in 1954 and the National Medal of Science in 1973. He was inducted into the National Inventors (2003) and the National Aviation (2012) Halls of Fame. When he passed away in 2009 at the age of 88, the Smithsonian Institution noted his ideas were each radical departures from conventional aerodynamic theory and forever changed flight. His papers are available in the WPI Archives.

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

PHOTOS NASA & WPI ARCHIVES

RICHARD WITCOMB '43 SHOWS OFF A MODEL USING HIS DESIGN TO REDUCE DRAG AT SUPERSONIC SPEED. AT FAR RIGHT, THE FIRST AIRCRAFT USED TO TEST THE DESIGN WAS A MODIFIED VOUGHT F-8 CRUSADER PROVIDED BY THE US NAVY.



Kenny Ching

ASSISTANT PROFESSOR OF ENTREPRENEURSHIP, THE BUSINESS SCHOOL

E-SPORTS EVENT BADGES

I do research into electronic sports (e-sports), using them as settings to study entrepreneurial team performance and other organizational questions. I am also genuinely a player and fan, and these event badges are my keepsakes from attending the biggest e-sport event of all: The International.

VR GOGGLES

The modern workplace is undergoing tremendous changes, precipitated by technological advances and the pandemic. I am currently studying how virtual reality (and augmented reality) tools are impacting organization learning.

BRUCE LEE ACTION FIGURE

One of the more interesting pockets of industry growth in recent years has been the surge of innovative energy in the plastic toys industry. Start-ups and incumbent companies alike have been churning out high-end pieces for collectors like myself. I have been documenting the industry's growth in my research.

MICROECONOMETRICS

I received my PhD at Massachusetts Institute of Technology, where I was trained primarily as an applied economist. This book has always been my trusty companion, and I maintain Stata is the best econometrics analysis platform.

WATER GLOBE

I am originally from Singapore, where most of my extended family still resides. We had just spent the loveliest time at Singapore's S.E.A. Aquarium.

GAMING HEADPHONES

True gaming headphones for long work sessions are reminders of the incredible growth in the gaming peripherals industry, driven by the e-sports phenomenon.

A MAN FOR ALL SEASONS

Before coming to WPI, I spent several years as a faculty member at University College London. I am admittedly an Anglophile, and still regard London as a second (and spiritual) home. Robert Bolt's seminal play is set in my favorite period of English history.

PHOTO BY TODD VERLANDER

PHOTO BY MATTHEW BURGOS

FACULTY SNAPSHOT

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

A VISIBLE STATEMENT

A mural celebrating diversity in STEM, funded by members of the Class of 2021 and others, was unveiled during a ceremony at Homecoming on Sept. 18. Local artist **Sharinna Travieso** was selected by the Senior Class Gift Committee to design and install the mural, which is located on the brick wall of the Rubin Campus Center that faces the Innovation Studio. "Our gift hopefully will spark conversations, influence policy on campus, and encourage more scholarships and work to be done for an improved future for our school and community. It sets the precedent for future diversity initiatives at WPI," says committee member Colleen O'Malley '21.



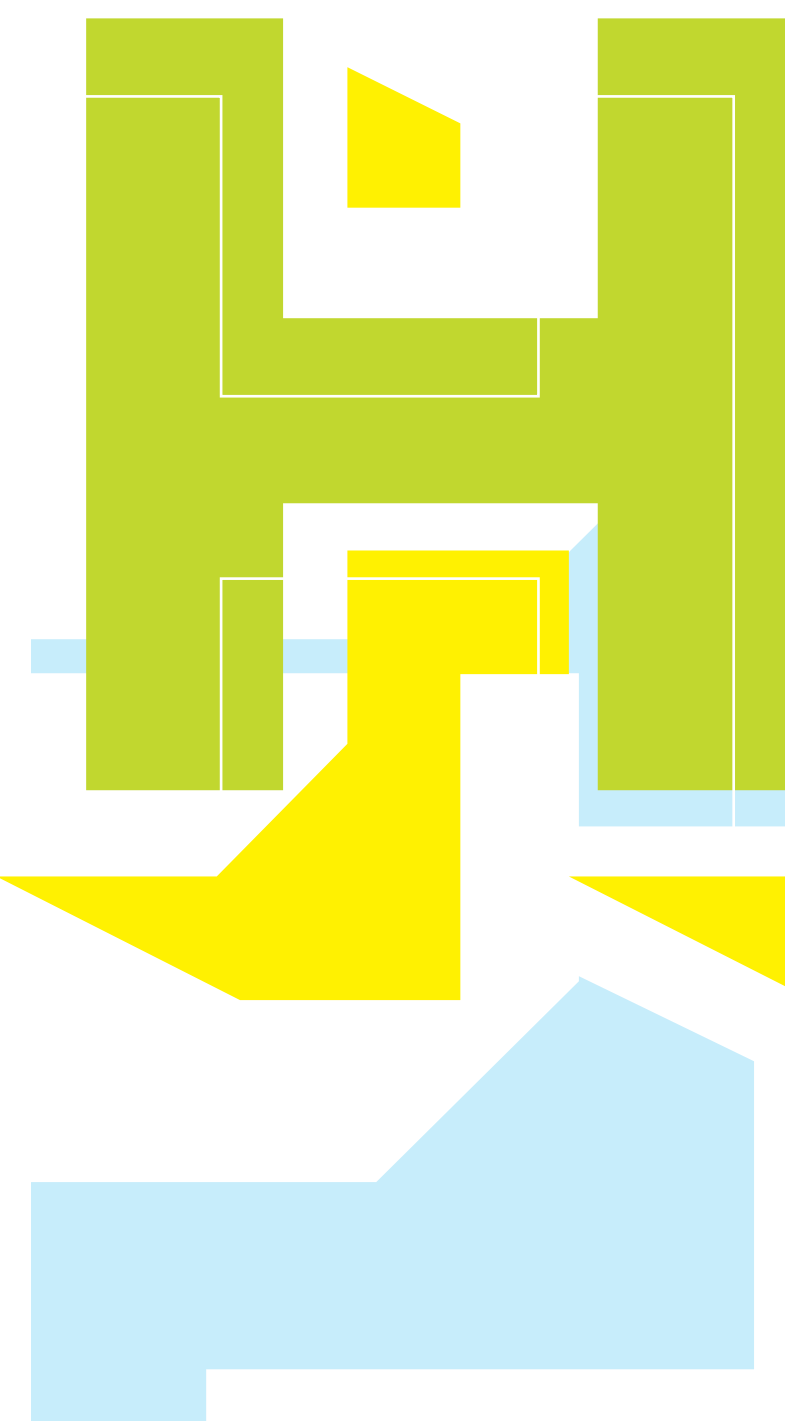
SENSE OF PLACE



THE GREENER SKIES

**HERMAN WIEGMAN '88
AND NATHAN WIEGMAN '15
HELP CHART THE COURSE
OF ELECTRICAL FLIGHT**

BY SCOTT WHITNEY
PHOTOGRAPHY BY DAVID SEAVER



HERMAN WIEGMAN '88 has the air of a man living his purpose—and who can't quite believe his good fortune. "Holy smokes," he marvels, as he walks beneath the wing of the electric vertical aircraft he helped invent and develop for the market.

To be sure, the ALIA-250 is a sight to behold: inspired by the shape and attributes of the Arctic tern, the gleaming white aircraft features a carbon-fiber skin, a swooping wingspan of 50 feet, and four vertical-lift rotors. But its greatest claim to fame is what's under the hood ... or rather, what is not. Eschewing a combustion engine in favor of an electric propulsion system, the ALIA aircraft boasts a 250-nautical-mile range on a single charge, bringing substantial electrical flight closer to reality. For Wiegman and his son, Nathan Wiegman '15, it's already been the journey of a lifetime.

TAKING THEIR TERN

The scene is familiar: A helicopter lands on the roof of a city hospital, carrying a critical organ transplant as cargo. The organ is delivered just in time and a patient's life is saved.

But at what environmental cost?

"If you save the patient but kill the planet, that doesn't make much sense," admits Wiegman. However, a viable and environmentally sound alternative to a traditional gas-powered helicopter would have to check two boxes: 1. It must represent a significant reduction in emissions. 2. It must be able to take off vertically in an urban environment and then transition to long-range flight mode. With the challenge set, entrepreneur and engineer Kyle Clark founded BETA Technologies and enlisted Wiegman and others to help work toward a solution—an aircraft that could both deliver on the mission and do so with zero emissions.

BETA is hardly the first engineering company to tackle an electric vertical take-off and landing (eVTOL) aircraft. But as they considered a variety of designs, the team leaned heavily on what has now become a mantra for BETA—simplicity. The team brings extensive experience in electric propulsion and energy storage. This internal know-how proved to be a game changer.

"Other innovators were working with articulating motors, for example, which can do all kinds of crazy things," explains Wiegman. "But as a pilot, you think, 'If there is a component failure, it would be best if it pointed in just one direction.'" In time, Wiegman earned his pilot's license, and the team soon discovered that—by developing a culture of flight throughout their new company—they could imbue their team with a practical edge.

"Imagine driving a car designed by people who've never driven one—it's nonsensical," says Wiegman. As BETA Technologies grew from a handful of employees to more than 300, the company began offering



“JUST LIKE ELECTRIC CARS ENABLE SOMETHING ENTIRELY NEW, ELECTRIC AVIATION WILL DO THE SAME”

free flight instruction to any interested employee, helping the team internalize the real-world conditions pilots experience in the air and translate that knowledge to informed design. Today, the vast majority of BETA's employees hold some type of pilot's license (fixed wing, rotorcraft, or other) or are in training to do so.

In facing the basic problem of achieving flight with a battery-powered plane, the BETA team turned to biomimicry—letting the natural world inform a design built for endurance.

"The Arctic tern flies the longest distance of any bird in the world, so when we were designing our aircraft, we ended up with very similar shapes and characteristics," says Wiegman. "Just as the tern minimizes its weight with hollow bones, we really cored out our aircraft. We also built it out of carbon fiber, minimizing the layers so it would be just the right strength."

Despite its fantastically engineered exterior, ALIA is dependent upon the capacity of its batteries for performance and range. And Wiegman is the first to admit, batteries are often the weakest link for any electric vehicle. "Energy storage tends to be the least technically mature element," he says. "Motors have been around for 150 years, and we've had vehicles for decades, but batteries like lithium-ion—they're

only a few years old, and that's the last element we need to make electric vehicles competitive."

Fortunately, energy storage is Wiegman's area of expertise—and at BETA, he has an especially close right-hand man on his team: his son, Nathan. A fellow WPI grad, Nathan was well qualified to join the BETA team in the critical role of battery safety specialist.

Together, the BETA team harnessed lithium-ion technology to give the ALIA a range of 250 nautical miles, nearly 100 more than most electric flight prototypes. And they have confidence that in just a few years, the next generation of batteries will increase that range considerably, a critical breakthrough for a company looking to replace traditional flight.

"Just like electric cars enable something entirely new, electric aviation will do the same," says Herman.

With a crackerjack team of pilots and engineers, BETA has brought their ALIA aircraft from concept to testing phase in just three years. And as the saying goes, "If you build it, they will come." In May 2021, BETA announced \$368 million in funding led by Fidelity Investments and Amazon's Climate Fund, increasing the company's valuation to \$1.4 billion.

According to Herman, this injection of capital will allow BETA to refine its aircraft's electric propulsion system and invest in an in-house manufacturing facility, both critical steps in bringing ALIA from an experimental aircraft to a product on the market. "For companies like Fidelity and Amazon to invest in what we're building is a real honor," he says.

Recently, thanks to the company's promise of lower CO₂ emissions and proof of concept, BETA has secured purchase commitments from United Therapeutics, UPS, and Blade, an "urban air mobility" aviation company. With overwhelming interest from a variety of sectors, it's clear that Wiegman's and Clark's dream of meaningful electrical flight finally has liftoff.

"I feel I'm a participant in the solution, rather than just a consumer of other people's solutions," says the elder Wiegman. "For an engineer, it's a little like watching your child grow up and make a real impact in the world."

CHARTING THE COURSE

In retrospect, Herman Wiegman's entire career seems to have pointed to this singular achievement; however, it was not always so obvious that this would be his destination.

"I was a tinkerer," Wiegman admits of his younger self. "Recording Casey Kasem on my dad's tape deck so I could stitch songs together, sticking screwdrivers into motors to see how they worked—anything to explore the technology." As with many would-be engineers, Wiegman found himself most at home in high school STEM classes, eventually setting his sights on WPI as a springboard to an engineering career. With the help of (now retired) WPI Professor Alexander Emanuel, Wiegman discovered the niche that would become his life's work: power electronics and energy systems.

As Wiegman completed his senior year at WPI, Emanuel offered him an introduction to the University of Wisconsin-Madison, where he would eventually earn his doctorate and participate in a hybrid vehicle challenge. "No one wanted to handle the battery in the hybrid system," he recalls. "I just thought it was another great opportunity to take stuff apart, make it better, and better understand the risks involved." In part, his experience in the challenge solidified his professional track as an energy-storage expert specializing in electric transport.

Wiegman's professional life continued at General Electric's Global Research Center (another opportunity suggested by Emanuel), where he spent the next several decades of his career.

"I became the battery-integration and energy-storage specialist at GE, working with hybrid vehicles, aircraft, wind turbines, and medical devices. For 20 years, I was happily putting batteries into industrial products. Our lives were comfortable, the kids were in college, and I thought I would continue on into retirement," Wiegman explains. "And then I got a surprise phone call."

The call came in 2016 from Clark, a fellow engineer and entrepreneur from Vermont who occasionally called on Wiegman for energy storage efforts. But this call was different, as Clark had much higher stakes in mind.

"He said, 'Hey, Herm, you want to do something a little crazy?'" recalls Wiegman. "Knowing Kyle, I had to ask, 'Does it involve waterskiing on Lake Champlain?' But nope—he wanted to electrify flight." Wiegman raises his eyebrows at the memory. "I told my wife I'd try this on the side, but I might also divert my 20-year career. What an opportunity!"

And divert he did. After eight months of moonlighting with Clark and securing an increasing amount of research projects, Wiegman knew he was headed for a major decision. He resigned from GE and began commuting to BETA's new headquarters at the airport in South Burlington, Vt.

During that time, he was making the long drive from his house in Niskayuna, N.Y. In 2016, Wiegman officially moved his family to South Burlington and stepped into a full-time role at BETA—as well as a new life as a pioneer in electric flight.

For Wiegman, only one thing could make this transition dreamier than it already was: to make aviation history with his son and fellow engineer by his side. That, too, could be arranged.

LITTLE WING

It was clear early in Nathan Wiegman's life that he had inherited his father's sense of curiosity. "In fourth grade, Nathan and his buddies built these desktop trebuchets to launch marbles across the classroom," Herman recalls. "And in middle school, they graduated to two-meter-long throwing arms that could hurl stuff across the football field." Needless to say, he figured he had a next-generation engineer on his hands.

Nathan also remembers his early penchant for mechanics, and credits his father for cultivating his interest. "Very early on, my father instilled in me the tinkering mindset," says Nathan. "My first vehicle was a motorcycle that came in various cardboard boxes." The two worked together to assemble the bike, and in the years that followed, they tore out the combustion engine, replacing it with an electric golf cart motor and battery.

The motorcycle project represents just one in a long line of engineering endeavors the father-son duo tackled through the years, playing no small role in Nathan's love for mechanics and electrical systems. So, when it came time to select a college, his father's alma mater was naturally under consideration. Nathan says he was sold after his first campus visit and tour. And once Nathan became a student, the parallels in their academic journeys would run closer than they could have expected.

While in his junior year at WPI, Nathan sent his father a text asking for help with a power electronics homework assignment. Something about the project struck Herman as strangely familiar. "I'm looking at the assignment on my phone, noting the handwriting, characters, and notation,

and I realized I'd seen this before," he said. In fact, the assignment was from Emanuel. "Here I was, helping my son with homework, assigned by the same professor!"

Their lives continued to run in parallel tracks when Nathan was ready to launch his engineering career. Following a teaching stint in China's Zhejiang Province, Nathan joined BETA's battery team, once again working side-by-side with his father. For many, the prospect of a parent as a coworker might be less than ideal—but not for the Wiegmans.

"Someone in our company asked Nate what it's like to work with his dad, and he said, 'What do you mean? We've been doing projects together for the past 20 years,'" recalls Herman. "I guess we may have upped the ante, though."

That's not to say that Herman is any less grateful for the privilege of having his son by his side. "How many father-son teams get the chance to work together at this level?" he says. "We're both very dedicated to moving the needle on a global scale, which is a huge opportunity and responsibility."

There's little doubt that the Wiegmans and the BETA team will, in fact, move the needle. Within the next few years, BETA expects to receive FAA certification, allowing ALIA to be flown commercially. The company's long-term plans include an autonomous model, as well as constructing a nationwide recharging infrastructure, and pilot training programs.

Make no mistake about it, the ALIA aircraft is coming to an airport, hospital, or distribution center near you. And while Herman is decidedly proud of the role he's playing in electric flight, he remains awestruck that he has a seat at the table. "I consider it such a privilege to be among a group of engineers who can say, 'Our designs, our prototypes, our testing—these could actually change the world.'" 

“OUR DESIGNS, OUR PROTOTYPES, OUR TESTING—THESE COULD ACTUALLY CHANGE THE WORLD.”





UNDERSTANDING
THE ROOTS OF

TELOMERE

FOR SHARON SAVAGE '91, MD, CHIEF OF THE
CLINICAL GENETICS BRANCH AT THE NATIONAL
CANCER INSTITUTE, TELOMERE BIOLOGY MAY
BE THE KEY TO FIXING WHAT'S BROKEN.

BY AMY CRAWFORD
PHOTOS BY JEFF MAURITZEN



DYSKERATOSIS CONGENITA IS A HEREDITARY DISORDER THAT AFFECTS AS FEW AS ONE IN A MILLION PEOPLE. THE CONDITION, WHICH USUALLY MANIFESTS IN LATE CHILDHOOD OR ADOLESCENCE, CAN CAUSE A WIDE ARRAY OF SYMPTOMS, RANGING FROM ABNORMAL FINGER-AND TOENAILS AND UNUSUAL SKIN PIGMENTATION TO BONE MARROW FAILURE AND PULMONARY FIBROSIS, AN ACCUMULATION OF SCAR TISSUE IN THE LUNGS THAT GRADUALLY INHIBITS BREATHING. DC, AS IT IS KNOWN IN RARE DISEASE CIRCLES, ALSO MAKES PEOPLE HIGHLY SUSCEPTIBLE TO CANCER.

The condition was first described in 1906, but it's only over the past few decades that scientists have identified the inherited genetic variants involved. This research led to the discovery that DC is actually one of a group of disorders of the telomeres, the segments of non-coding DNA at the ends of our chromosomes that protect them from damage.

"The analogy we always use is the plastic cap at the end of your shoelaces that keep them from fraying," says **Sharon A. Savage '91, MD**, chief of the Clinical Genetics Branch and clinical director of the Division of Cancer Epidemiology and Genetics at the National Cancer Institute (NCI), whose research focuses on DC and related telomere biology disorders. "When our cells divide and our chromosomes are replicated, telomeres get shorter. For the most part, cancer is a disease of aging and there are many interesting associations between telomere length and cancer risk."

In DC and related conditions, however, telomeres are unusually short from birth, and patients tend to have abnormalities in the proteins that maintain them. Faulty telomere biologies also make people unusually prone cancer. And because of that connection, DC research has implications beyond helping patients and their families. In fact, studying telomere biology may help reveal how and why cancer starts—and how it might be prevented. That's the hope at the heart of Savage's research, and for two decades, it has been the driving force of her career.

"I am really interested in understanding why people get cancer," Savage says. "I want to understand cancer from the large-scale level of epidemiology, all the way down to the genes and these rare disorders that

affect key components of our biology. We need to understand why it's broken, right? If you don't know why something is broken, you can't fix it."

AN EARLY SCIENCE FASCINATION

Savage grew up in rural Maine, "almost in the middle of nowhere," she says with a laugh. "Between Bangor, if you know where that is, and Mount Katahdin. My high school graduating class was 70 people."

No one on either side of her family had gone to college, but Savage was fascinated by science from a young age, and she always knew that higher education was for her. In junior high she read *The Double Helix: A Personal Account of the Discovery of the Structure of DNA*, molecular biologist James D. Watson's autobiographical account of the momentous discovery, for which he shared the Nobel Prize with Francis Crick in 1962. Published in 1968, the book later became controversial for ignoring chemist Rosalind Franklin's critical contributions—a case of historical sexism that Savage mentions wryly today.

"But when I was in seventh grade reading this book by Watson, it was really just remarkable," Savage says. "I always just wanted to understand it more. I was interested in DNA and cells and biology, and was reading this stuff on my own."

When Savage was a junior in high school, her chemistry teacher connected her with a food science professor at the University of Maine who invited her to work in his lab over the summer, conducting research into pesticides. By the time she began to think about where she might go to



"WE NEED TO UNDERSTAND WHY IT'S BROKEN, RIGHT? IF YOU DON'T KNOW WHY SOMETHING IS BROKEN, YOU CAN'T FIX IT."

college, Savage knew she wanted to be a physician-scientist. She also knew she wanted to see the world beyond her hometown.

"I didn't have anyone to reach out to," she says, "but I got a flyer in the mail about WPI, and I thought, 'Oh, the WPI Plan sounds like something I might really like.' It was when we went there to visit in person that I realized, 'This place is for me.' It wasn't too big, and it had the project-based curriculum that was exactly what I was seeking. There would be opportunities for research. I knew research was always going to be a part of what I did."

During her time at WPI, Savage, a biochemistry major, worked as a summer research assistant at the independent Worcester Foundation for Experimental Biology, where she studied cell motility in amoebae, a project that became her MQP. She played tennis—not well, she confesses—but, "It was a lot of fun," she says. And she joined Alpha Phi Omega, the service

fraternity, where she met **Keith Picthall '92**, an electrical engineering major whom she would later marry.

Even among the hardworking students at WPI, Savage stood out, Picthall recalls.

"She was just very engaged, very driven, but also very approachable," he says. "She was definitely passionate about research. My friends and I were all looking for the summer jobs that would pay the most, but for her, it was all about the science."

TREATING THE ENTIRE FAMILY

After graduation, Savage enrolled at the University of Vermont College of Medicine. She took two years off to do research at the National Cancer Institute through the NIH Medical Research Scholar Program before earning her MD in 1997. She followed up with a residency in pediatrics at

“WE THINK OF THESE RARE DISEASES AS A PROTOTYPE FOR EVERYTHING ABOUT CANCER—THE IMPLICATIONS COULD BE FAR AND WIDE.”

Children’s National Medical Center, in Washington, D.C., and a fellowship in pediatric hematology/oncology at NCI’s Pediatric Oncology Branch at Johns Hopkins University. That specialty combined Savage’s interests in human development, cancer, and genetics, but it also required skills a young physician doesn’t always learn in medical school.

“I love the kids—in some ways it’s not hard, because the kids are amazing. They are so strong and so resilient,” Savage says. “We have a lot of patients with pediatric cancers who do great, and then there are also kids who don’t. That, and also helping the families and the patients manage the side effects of the drugs, was really hard.”

In some ways, she says, a pediatric oncologist has to treat the entire family, working with patients and their parents to navigate a scary and confusing experience.

“You see these parents looking like a deer in the headlights as you try to explain what’s going on,” Savage says. “I remember one of my first patients with a new diagnosis of cancer, a neuroblastoma. I was a fellow, trying to explain to her parents how their 18-month-old could have this cancer on her adrenal gland. Just helping them understand that this is happening can be really challenging. Of course, it’s really rewarding, too. In pediatric oncology, you develop these long-lasting relationships with the families.”

Helping individual children beat cancer is rewarding work, but like her patients’ overwhelmed parents, Savage wanted to understand why cancer happened in the first place. And, as it turned out, the personal touch she developed as a pediatrician treating children with terrifying diagnoses would also be invaluable in the lab.

In 2006, Savage joined NCI’s Clinical Genetics Branch as a tenure-track investigator, quickly becoming involved in an ongoing longitudinal study of large, multigenerational families in which many members had dyskeratosis congenita. Her work led her to identify a new gene, TINF2, which encodes instructions for making part of a protein complex called shelterin that works to maintain telomeres.

“That really set the stage,” Savage says, “because now we know TINF2 variants cause about 20 or 25 percent of telomere biology disorders.”

TINF2 was the first gene Savage discovered, but as genomics and gene sequencing technology improved over time, she and her team have discovered more genes linked to DC and related conditions—there are now at least 15, which contribute to some 80 percent of telomere biology disorders. The family study is ongoing, and Savage has established long-term relationships with many participants, and individuals within the worldwide community of people affected by telomere biology disorders.

AN ADVOCATE FOR PATIENTS AND FAMILIES

Katie Stevens’s 20-year-old son has a telomere biology disorder that led to a diagnosis of aplastic anemia at 11. He’s now doing well, six years after a successful bone marrow transplant. Meanwhile, the experience led Ste-

vens to get involved in advocating for other patients and families. She is now CEO of Team Telomere, a support, education, and advocacy nonprofit for patients and families with whom Savage has worked closely since its inception.

“My job is to try to get physicians and researchers to listen to the patients,” Stevens says. “But I don’t have to do that with Sharon, because she’s always been the one asking, what do they need? What’s going to help serve them? It’s never been about her agenda. It’s always been about the patients’ needs. And it’s just incredible to work with her and to see that, and to be able to use her as an example for other people.”

Participating in research can be bittersweet for those whose loved ones suffer from rare diseases—too often, findings that might have led to new treatments come too late to help. But Stevens says Savage has always made it clear that the contributions of patients and families to research are immensely valuable, whatever the outcome.

“It’s a double-edged sword, depending on the day, for people who have lost children to know that new advances in research could have helped them,” Stevens says. “But I think there’s comfort in knowing that their cell lines are still here and being looked at and taken care of and are advancing research. The daughter of one of my dearest friends passed away from this disease. After Rilee died, my friend got a letter from Sharon. And it just meant so much to her that Sharon had taken the time to write, just promising that even though Rilee had passed away, Sharon would still continue to look for answers.”

TELOMERES’ CONNECTION TO CANCER RISK

Savage’s findings have obvious implications for DC patients and their families, but studying the rare variants that cause telomere biology disorders can also help researchers understand how more common variations in the same genes may be connected to cancer risk.

“What I’ve been doing in the telomere biology disorders has been looking at the nitty gritty biology,” Savage says. “We are also thinking about telomere length in the general population, and how that could be a potential risk factor for cancer.”

Dr. Payal Khincha first met Savage shortly after she arrived at NCI as a fellow in 2012. She was looking for a mentor and wound up serving as a trainee in Savage’s group, drawn not only by Savage’s approach to research, but by the larger implications of her investigation into some of medicine’s most frustrating puzzles.

“Her research is not shiny like CRISPR and some of the new genomics things, but it struck me as so important,” Khincha says. “The impact is so big, even if it’s not always obvious. From the grassroots level, it’s important to understand how things happen, why things happen, and what we can do about it. We think of these rare diseases as a prototype for everything about cancer—the implications could be far and wide.”

It wasn’t just Savage’s research that appealed to her, adds Khincha, who is now principal investigator for NCI’s longitudinal family study on Li-Fraumeni Syndrome, another cancer predisposition disorder (Savage is lead medical advisor on the project). “I also realized I wanted to be her when I grew up—not just that career trajectory, but she’s very down-to-earth, very practical, and she understood there was life outside of work. It’s a hard balance to strike, but it’s one that she does so effortlessly.”

BALANCING LIFE AND LIFE-SAVING WORK

“The concept of work-life balance isn’t really a balance,” Savage remarked. “It’s a juggling act,” one that she notes would be nearly impossible without the support of her husband, Keith Picthall, as they navigate parenthood and their careers together.

For Savage, that juggle has been a little harder lately, as the COVID-19 pandemic forced her and most of the scientists at NCI to work from home. As branch chief, she oversees a team of 11 principal investigators, two dozen research fellows, and clinical staff that includes genetic counselors, nurse practitioners, and physicians—a total of about 60 people. But COVID precautions meant that much of their research was put on hold, and many patients and study subjects, who usually travel to NCI’s Maryland campus from all over the world, were unable to do so.

During the pandemic, Savage, whose hobbies include nature photography, has maintained her sanity through exercise and by getting outdoors with Picthall, their two children, and their dogs as much as possible. Last year, she ran her first marathon.

“It was virtual,” she says, “but it was the Marine Corps Marathon—I finally checked that off my bucket list. It was hard, but I did it. It was, I think, as much a mental challenge as anything else.”

It’s obvious, though, that Savage is itching to get back to the lab, says Picthall. Her recent appointment as clinical direc-



tor has brought many other responsibilities, but it’s clear to those who know her that research is still where her heart is.

“I know every time she has an opportunity to dip back into the science, she’ll take it, even if it means working a lot harder,” Picthall says. “It’s always been about the science.”



*On the
Threshold of
Discovery*

LEAP@WPI/QCC advances
photonics possibilities

By Julia Quinn-Szcesuil
Photography by Matt Burgos

Most of us already use some form of photonics every day. Think of using a remote to change a television channel across the room, connecting to the internet using fiber-optic cables, or having laser eye surgery.

But this technology—which uses photons (light) guided through glass pipes rather than electrons guided through wires to enable faster, smaller, and less costly ways to transfer information—has potential that’s almost otherworldly. Integrated photonics applications could someday help your phone sense if you have diabetes long before an appointment with a physician confirms it. Or it may lead to a smaller endoscope that could diagnose abnormalities in a manner that today’s available technology simply can’t.

At WPI, all those futuristic possibilities are potential reality at the Lab for Education & Application Prototypes (LEAP@WPI/QCC).

A government-backed research and development partnership between WPI and Quinsigamond Community College (QCC), LEAP@WPI/QCC combines photonics education, application, and workforce development into a one-stop shop that blends the strengths of each institution and works within a developing ecosystem to build a foundation for this emerging technology to take off.

Offering equipment, space, and expertise, LEAP’s dedicated area in WPI’s Gateway Park serves as an innovation sandbox where researchers have the tools needed to push the boundaries of science, business partnerships bring ideas to market, and educators prepare a technical workforce ready to scale up the innovative materials as these developing technologies progress.

INTEGRATED PHOTONICS IN A NUTSHELL

Photonics and optics researchers study the science of light and how it behaves and interacts with the world. Integrated photonics, which places photonic and optical components onto an integrated circuit that serves as building blocks for photonic integrated circuits (PIC), is just beginning to be parlayed into advanced research, says LEAP director Doug Petkie, department head and professor of physics at WPI. Right now, advances in developing photonics technology and investment on the local, state, and federal level are bringing this science to the forefront.

Integrated photonics is multidisciplinary in nature, so the potential impact for industries from communications to medical to military is broad and only barely imagined, let alone discovered, says Petkie. But it also requires an overhaul in thinking and infrastructure for a technology that’s not widely used or understood—yet.

Photonics and electronics currently operate on separate systems, so while future years might find photonics dominant, the in-between technology places photonics and electronics on one chip—called integrated photonics—and it’s the sweet spot for LEAP.

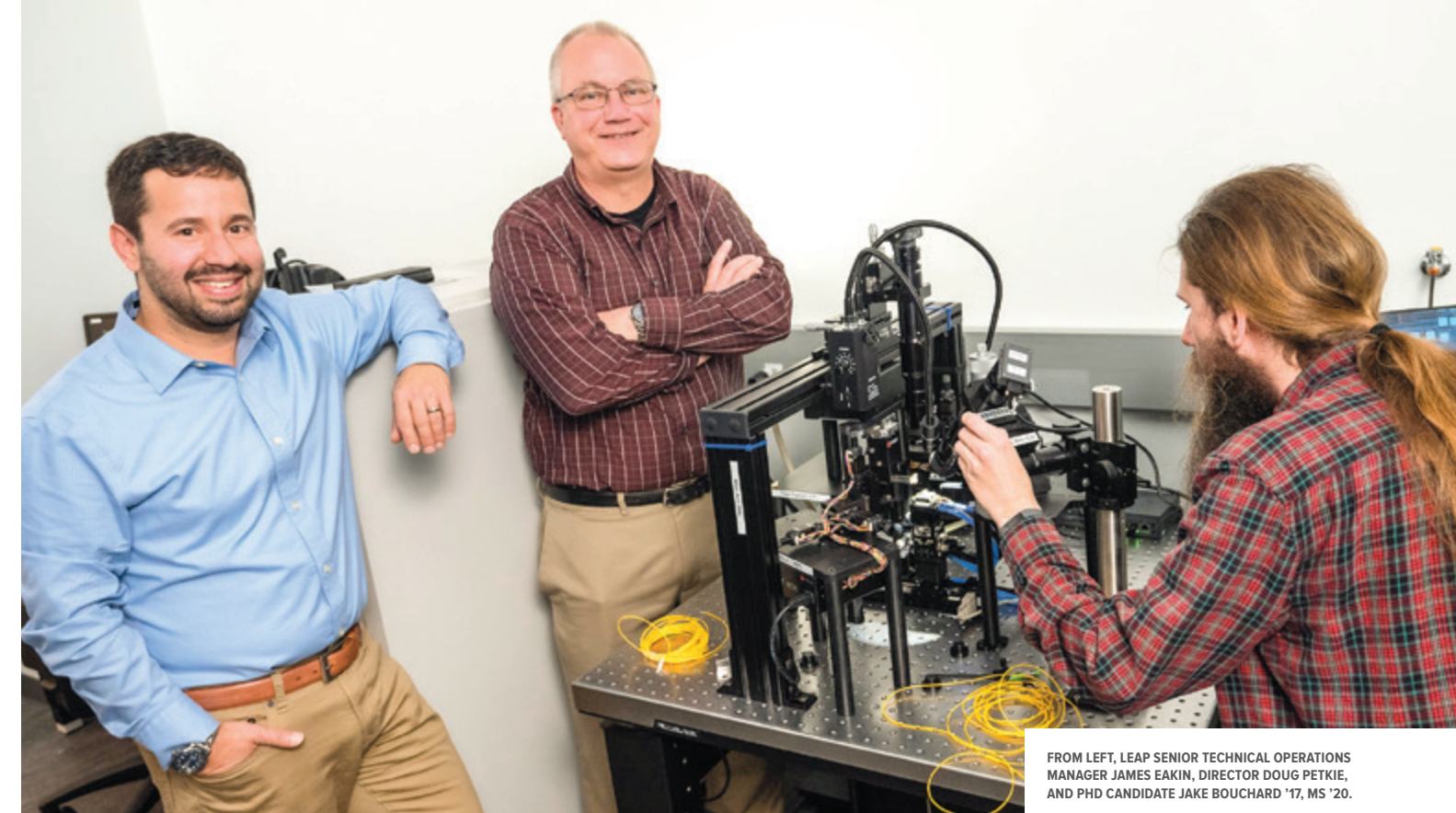
To get to the next step of bringing radical ideas to existence, critical government backing is seeding an ecosystem of LEAP facilities. The American Institute for Manufacturing Integrated Photonics (AIM Photonics) is one of 16 advanced manufacturing institutes included in the national Manufacturing USA initiative. Boosted by Mass. Manufacturing Innovation Initiative funding (in which the state matches federal funds), Massachusetts now has a growing constellation of LEAP facilities that includes MIT, Bridgewater State University, Stonehill College, and Western New England College (LEAP@WPI/QCC is the second established LEAP in the state). Each facility has a specialty, ranging from telecom and data (internet), light detection and ranging (radar), sensing (food safety, military), and microwave photonics technology (5G and 6G technologies).

“The idea is to create a network for advanced technology and create a workforce to support the manufacturing and research,” says Petkie. “WPI’s expertise in chemical and biological sensing, and some overlaps in microwave photonics and PIC sensing, will guide much of the work here.”

MANUFACTURING TRAJECTORY

The multi-industry benefits of photonics are similar to Worcester’s earliest manufacturing successes with the production of tinware, textiles, and wire products. From developing a technically proficient manufacturing workforce on an emergent technology to harnessing the innovative ideas of industry leaders who will advance the use of photonics, LEAP positions WPI at the center of this developing technology.

Fitted with expensive, state-of-the-art equipment that is prohibitive for many companies to acquire or

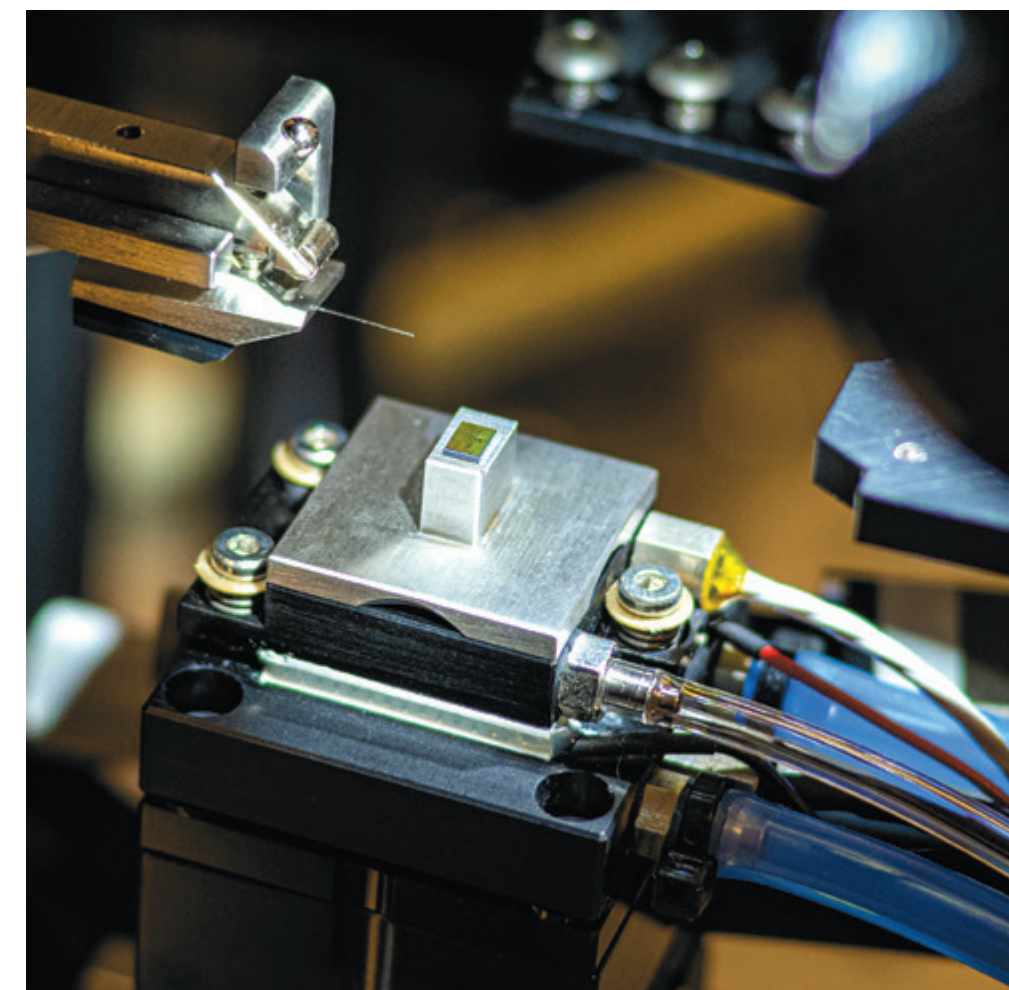


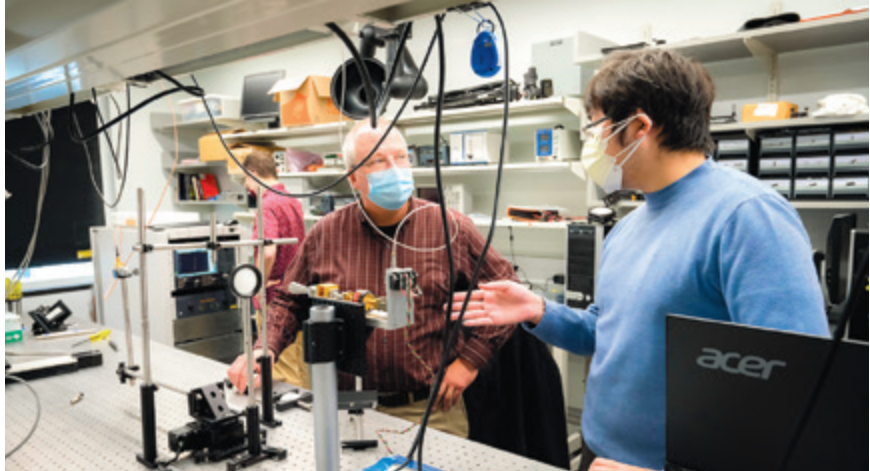
FROM LEFT, LEAP SENIOR TECHNICAL OPERATIONS MANAGER JAMES EAKIN, DIRECTOR DOUG PETKIE, AND PHD CANDIDATE JAKE BOUCHARD '17, MS '20.

individuals to access on their own—such as a nanoscale 3D printer for prototyping or a probe machine for non-invasive optical metrology for reliability testing—the LEAP@WPI/QCC facility provides opportunity found in few other places. The space serves as a research lab, project classroom, industry sandbox, and real-world toolkit for education, research, and training. Testing and research potential also includes fiber optics, fiber-chip interfacing for integrated photonics, terahertz sensing, and optical and electrical device characterization.

James Eakin, senior technical operations manager at LEAP, says some of LEAP’s potential innovations will change the most basic ways we go about our lives. Someday the need for a traditional computer displays could even disappear, as augmented- and virtual-reality technologies emerge. Another example is photonics-based 6G “wallpaper” that acts like an invisible and large antenna to route connectivity and transfer information. Photonics also plays a role in improved personal safety as military personnel could wear clothing with embedded sensors to detect minute amounts of dangerous chemicals in the air.

With developments from each industry collaboration, a domino effect will spill over into other industries, Petkie says, with reduced environmental impact being especially evident. When communications and data transfer moves to a photonics-based process, the footprint of sprawling data centers—now required for moving volumes of data and communications—will be drastically reduced even as their data output rises dramatically.





WPI's rich resources and expertise in manufacturing, physics, electrical and computer engineering, and materials science overlaps in the projects to see how photonics interacts with different materials, in diverse settings, and with various components. This kind of multidisciplinary collaboration is key to bringing photonics possibilities to the broadest use.

QCC COLLABORATION AND WORKFORCE DEVELOPMENT

To reach its full potential, photonics requires researchers who can uncover the best applications for the technology, educational opportunities in photonics science, facilities and equipment to produce and work with components, industries that can put photonics applications to real-world use in processes and products, and a trained workforce that can manufacture the tiny components needed throughout the process.

"There's a lot still in flux," says Adrienne Linnell, QCC's program administrator for STEM Initiatives. "We need the technicians for jobs with integrated photonics, and we need PhDs doing research to develop the products and systems that will require integrated photonics. And as it morphs, photonics work pulls in jobs."

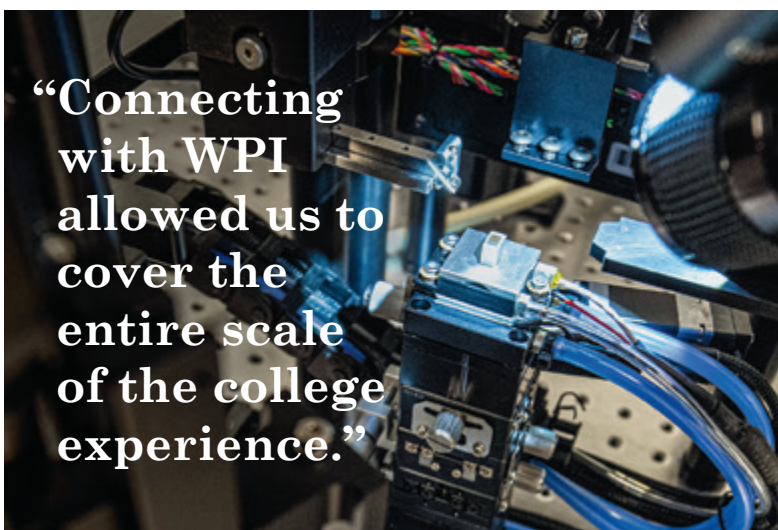
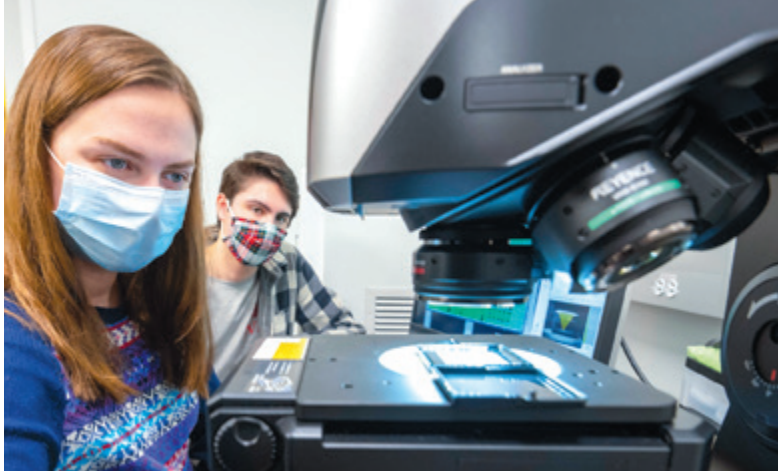
Jacob Longacre, professor of electronics engineering technology & photonics at QCC, says the collaboration between QCC and WPI allows for a full-circle approach. "As we looked down the line, we knew this would become something that involves all levels of education," he says. "Connecting with WPI allowed us to cover the entire scale of the college experience."

Longacre sees WPI's project-based approach as an ideal fit for QCC students, especially as many of them are already in the workforce and can put their new skills to immediate use. "Project-based learning is more than just book learning," he says. "We work with academics in engineering, but we're also technology- and workforce-based." As QCC students learn about optics in class, the collaboration with WPI students on photonics research projects gives them the real-world experience to go with it.

"It's showing our students first how to do something, and then it's showing them what's possible," says Longacre. "There's not a huge need for technicians yet, but we're making sure we're ready for it and can fill in with additional knowledge the students need. The idea is to make sure the technicians-to-be can understand the workings so they can handle what comes at them." Programs to train students how to build components and how those components fit into photonics applications ensures that enough needed—and exacting—product is available both for research and, as the industry scales up, for eventual widespread production.

With LEAP's focus on education, training, and innovation, industry partners receive some enviable perks. Based on a pay-for-use structure, they are able to use the facilities in the ways that work best for their resources—whether that means working in the lab or asking LEAP staff to run tests or tasks. "Most employers don't want to be that deep in the process," says Longacre. "We can say, 'This is what's being worked on, this is what's being done, and this is who we can introduce you to.'"

The promising applications of photonics will dramatically increase the speed of data transfer and sensing—and this is the area of photonics where WPI has a specialty and



broad expertise. "Photonics opens the capabilities for sensing," says Petkie, "and how light interacts with the world instead of electrons. With spectroscopy, you can have a device that can sense the world around it. And sensing the world around us is our focus in chemical and biological sensors."

Of the different ways WPI researchers are exploring photonics, Yuxiang Liu, associate professor of mechanical engineering, is using fiber optic sensors to detect cancer cells; others are developing a robotic hand.

RECIPROCAL INDUSTRY PARTNERSHIPS

The potential for job growth through LEAP is tremendous as companies can use the equipment (after a training period) without a hefty investment in capital or space and consult with LEAP experts to weigh the potential on moving forward with a project.

Right now, industries are learning how photonics can elevate their work, and tours of LEAP are helping them envision what's next. "Our mission is to support industries with what they need now and to make them aware of the technologies available and the efficiencies in when they can bring a product to market," says QCC's Linnell.

For Uxbridge, Mass.-based Iradion Laser, a maker of ceramic core CO₂ lasers, LEAP's reciprocal benefits are clear. The company is talking with the LEAP team about characterizing some parts to see if the parts deliver the expected results so Iradion can use them most efficiently. Having the facility in such close proximity saves time and money and has even opened the door to some possibilities Iradion hadn't previously considered, including equipment they hadn't had access to, says Talia Martin, a laser engineer at the company.

Julio Ramirez, director of research and development at Iradion, says students at LEAP could eventually turn into job-ready employees and collaborating with them at LEAP is beneficial to both sides. "We have to compete with many other companies and countries," he says. "We can give students an idea of what they are going to face." The growth, he says, happens on both sides and that spills over into the growing photonics ecosystem.

CUTTING-EDGE STUDENT ACCESS

Students say seeing the academic and industry involvement informs their own work. "Some companies may give us some chips and ask us to measure them and report back on their performance," says Jake Bouchard '17, MS '20, and current PhD candidate. "Others may want to come in and work on the chips themselves if they have classified projects or if they don't want the technology they are working on to be known. Here, they gain access to millions of dollars of equipment and people who know how to use it, who can teach them how to use it, or who will do the work on the equipment for them."

Bouchard says the ability to work on photonics research with in-depth training and access to complicated and highly sensitive equipment at LEAP is a rare opportunity for students and gives them a chance to connect their coursework with real-life use. "All the different applications of this technology drew me in," he says. "Physics in general has so many varied applications—I call physics a 'Swiss Army degree'—and photonics is such an up-and-coming application." In his own work, Bouchard's undergrad projects flipped a switch for him. "I started to look at my courses and ask, 'what can I get out of this to apply directly to my research?'," he says. "I would come across an application and know it was something I wanted to understand more."

Bouchard's been running tests on AIM-supplied chips and helping set up and use the LEAP equipment so he'll be able to train students, researchers, and industry partners on proper use. He's also been offering introductory LEAP tours to industry partners who are curious about the facility, what's available for use, and how teams can help advance their business goals.

Working with such miniscule components requires some adjustment. "It's not always the size," Bouchard says. "It's how fragile they are. These are the early stages, so the manufacturing process is expensive." As he uses the test chips in a probe machine, he looks at

how light works as it travels through the sides of the chip. "If you pick that up with tweezers and nick the side of it, the navigation of it is useless," he says. "That's the hardest learning curve—how to work with things that are so fragile."

Morgan Kaler '22 began her Interactive Qualifying Project (IQP) at LEAP just as the COVID pandemic shut down the university (a cancelled April 2020 LEAP ribbon-cutting ceremony will be rescheduled). Her goal is to chart how LEAP@WPI/QCC would evolve on its own, with the varied interests of different stakeholders, and within the larger LEAP ecosystem. Kaler says the recent pickup in activity offered insight into how LEAP will be used and gave her tech operations management experience that has helped standardize and measure LEAP's forward process.

WATCHING PROGRESS MATERIALIZE

LEAP removes one of the biggest barriers for photonics growth—access. "Opportunities to get your hands on equipment is not that common," Bouchard says. "Only a few universities have LEAP labs or the equipment to train people so they can go out and get those jobs. It's definitely cool to interact with these pieces of equipment."

The hands-on experience they get at LEAP is valuable, Kaler agrees, noting other students are already working at LEAP on IQPs and MQPs (Major Qualifying Projects) as well as other projects. "There are so many opportunities for students to get involved here," Kaler says. "Whether it's with doing research with a professor or by finding an IQP or MQP—right now, most of our users are students. As a student, it's exciting to see my peers getting these kinds of opportunities."

Kaler says LEAP offers exactly the experience WPI is known for. "In courses, you're learning things that are theory-based, and you have to learn that to understand it," she says, "but there's not lots of room for the practical. LEAP gives an opportunity to build on what you've learned. You can say, 'I've heard about this,' and now you get to see how it works. One of the coolest things here is being able to see the collaborations and see the progress being made. Equipment is being used. Research is being done, and publications are coming out of it. The technology is advancing every day." 📌

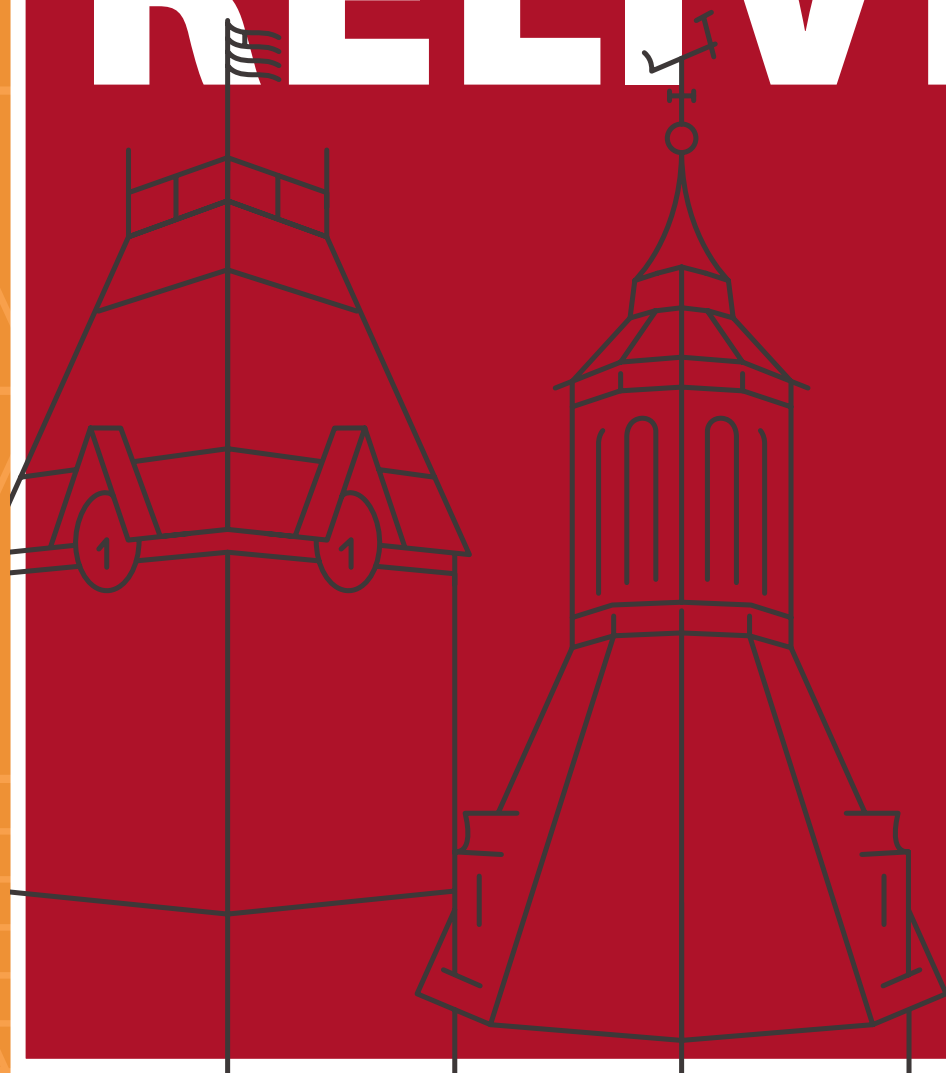
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No one understands the importance of planning better than you. Identifying and prioritizing your goals is an important first step. It's also the first step to smart financial planning, which is where WPI's Planned Giving Office can help. Need an income stream during retirement? Looking to pass down assets to future generations tax efficiently? Selling a business? Let us show you how you can participate in *Beyond These Towers: The Campaign for WPI*, while providing a strong secure financial future for yourself and your loved ones.

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From the Desk of

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

As short days and long nights slow the pace of life a bit, I find myself reflecting on the flurry of activity that closed out the calendar year on The Hill. Undoubtedly, the highlights were the partnered success of Giving Day and the global launch of *Beyond These Towers: The Campaign for WPI*.

GIVING DAY

Besting last year's Giving Day numbers, the WPI community—alumni, parents, students, faculty, and staff—gave back generously in support of the projects and programs that make WPI special.

GIVING DAY 2020

900+
Donors

\$379,000+
Dollars Raised

GIVING DAY 2021

1,200+
Donors

\$411,000+
Dollars Raised

Beyond These Towers: The Campaign For WPI

The campaign entered its public phase and positions WPI to meet the world's ever-growing demand for innovators, educators, makers, and doers—people with the know-how and the tenacity to work across disciplinary, cultural, and geographic boundaries to take on the world's greatest and most consequential problems. *With Beyond These Towers: The Campaign for WPI*, we launch our expedition to a brighter world.

\$354+ MILLION

Raised toward the \$500 million goal

382

Virtual Launch Attendees

29

States Represented

2025

Youngest Class Represented

1959

Oldest Class Represented

One of the many important initiatives supported during Giving Day and through *Beyond These Towers: The Campaign for WPI* is a new Center for Well-Being. The Center will serve as a hub for university-wide efforts to elevate student and campus well-being. Please consider a gift in support of mental health awareness training for students, faculty, and staff; for peer advocacy, education, and wellness programming; and for academic initiatives to promote well-being.

wpi.edu/+alumni | wpi.edu/+give | wpi.edu/+beyond



A Return to the Radio Shack: Wireless Association Alumni Make a Connection

The university recently welcomed WPI Wireless Association (WPIWA) alumni back to campus. Student Alumni Society (SAS) members **Corinne Hartman '22** and **Meredith Gauthier '22** had the pleasure of leading the group on a memory-laden campus tour. The highlight for the group was the highly energized visit to the Wireless Association operating station. Also known as the Radio Shack, the tiny yet exhilarating space is all but hidden at the top of a steep staircase in Salisbury Laboratories. The Radio Shack features a door that only licensed and authorized radio operators may use to access WPI's prized antennas. The main antenna, known as W1YK, sits atop a 60' tower. The height of the tower combined with the height of the building affords W1YK some of the best wireless coverage in New England.

Founded in 1909, by Oliver K. Jacobs, WPIWA has the proud distinction of playing a formative role in the beginnings of Amateur Radio worldwide. The club's first station consisted of a transmitter running to a flat-top antenna and a receiver with a design centered around a detector. WPI established the first operational college radio station in the United States, and over the years, WPIWA has been at the forefront of radio technology. Today, W1YK is still experimenting in modern modes of Amateur Radio.

WPIWA alumnus **Gene Balinski '80** recently explained the impetus behind the group's informal campus reunion. "**Scott Nacey '83** contacted a fellow Wireless Association member in the area, as he was coming east from California to visit family. Scott wanted to take the opportunity to connect with fellow WPIWA members, and Worcester quickly became the choice meeting location. The initial discussion expanded into a possible campus visit, which, in turn, morphed into a visit to the Radio Shack—the frosting on the cake."

Balinski is currently a Raytheon communications lead for government defense programs. He works closely with government customers and soldiers to develop new communications systems and provide solutions to communications problems for global fielded systems. He describes his student experience at WPI as "...terrific. WPI is a great academic institution that gave me the tools to go as far as I wanted in both my career and my life. For me, it was great socially as well. Being able to walk to the Wireless Association

Radio Shack (long before the advent of cell phones) and operate a well-equipped, powerful station allowing worldwide communication was a tremendous amount of fun and a great stress relief after a tough week of classes. My then girlfriend, now wife, remembers many Friday nights in the shack."

SAS Public Relations Chair Corinne Hartman '22 was happy to co-lead a tour for the WPIWA alumni. "Being a member of SAS has been a major part of my time at WPI and being able to engage and interact with the campus community is incredibly fun and very rewarding," she says. "One of my favorite activities, however, is interacting with alumni, because even across years and areas of study there is almost always something to learn and something we find in common."

About the WPIWA tour, Hartman shares, "The Alumni Wireless group members were all extremely passionate and excited about wireless communications and about WPI. They were all animated when sharing their knowledge of wireless communications and its history. They also shared stories of what student life was like when they were students and we got to compare what events still occur, hear about events that no longer exist, and share new events that have started since they graduated."

Hartman notes that seeing the WPIWA alumni reminisce about what had changed on campus and what stayed the same was especially exciting and gave her a meaningful glimpse back in time to what WPI was like when they were students.

Balinski echoes her enthusiasm about the visit: "Coming back to campus was absolutely incredible. It was really wonderful climbing the stairs again to the Salisbury roof-top Radio Shack. It brought back so many great memories. It seems cliché to say that so much has changed in the 40 years since I graduated, but it has, and as far as I could tell, all for the better. It made me want to be a student again."

Visit <https://users.wpi.edu/~wpiwa/> for more information on the WPI Wireless Association.

—Sira Naras Frongillo



FROM LEFT, CORINNE HARTMAN '22, NELS ANDERSON '78, JONATHAN KANTER '83, DAVID CURRY '82, JAMES IDELSON '80, ERIK THORENSEN, ARTHUR PIZER '79, SCOTT NACEY '83, EUGENE BALINSKI '80, ANDREW ABERDALE '89, CHAIR, WPI BOARD OF TRUSTEES, AND MEREDITH GAUTHIER '22



TURNING POINT

Years of Hard Work Lead Quontay Turner '11 to the Emerald City

If, as the old adage goes, luck is when preparation meets opportunity, then **Quontay Turner '11** is very lucky indeed. She took the leap as a full-time small-business owner and opened Emerald City Plant Shop in May 2021, a mere five months after spotting an empty storefront on Washington Street in downtown Norwood, Mass.

"I heeded the call, and everything kind of fell into place. People have flocked to it," says Turner, who also sells her tropical plants at various pop-up shops, including one on Newbury Street in Boston.

The initial success of the cozy plant shop and event space—that she describes as an "indoor tropical oasis"—is the result of hard work by Turner, who for years fulfilled her creative passions in her spare time while also holding down traditional full-time jobs. Now fully committed to entrepreneurship, she is finding joy sharing her knowledge of plants and their care, as well as continuing to foster a sense of community in her overlapping worlds.

"The best part is helping people who had struggling plants that are now thriving," she says. She calls herself a plant matchmaker, asserting that even self-proclaimed brown thumbs can be successful. "There's a plant for everyone; you just have to find it. My goal is to get everyone in my life to have a least one plant."

This love of horticulture was passed down through her nana, who gifted her with a few clippings that soon grew to take over Turner's home. "It was great self-care practice for me. It was very therapeutic to see them grow. That's when I realized there was no real place to go to get information on how to care for these plants."

Always hustling

The seeds of her business began in 2015, when she started selling her Black pop culture-inspired artistic projects online and at pop-up shops, under the business name Q_Made It.

"I've always been creative and crafty, and I seem to be able to identify a need and fill it. I would essentially make things for myself that I liked—specifically things that speak to Black pop culture—and other people would like them too," says the Mattapan native who double majored in civil engineering and environmental studies.

She worked briefly as an engineer after graduation and then returned to WPI to spend several years as an admissions counselor and a staff member in the Office of Multicultural Affairs before moving to the admissions office at Emerson College. All the while, she continued to design and sell her artwork in her spare time.

Then in 2018, while at Emerson, her Wakanda-inspired pin went viral. "I was basically reading applications all day," she says, "filling orders at night, and I couldn't continue to burn the candle at both ends." She eventually quit her admissions job to devote more time to Q_Made It, but when the viral interest in her pins waned, she was forced back into the job market.

A pandemic push

At the beginning of the pandemic, she joined Commonwealth Kitchen as the food entrepreneurship programs manager helping new food businesses in Boston get their start. She also worked part-time at Niche Plant Shop in the South End, where she soaked in all she could about tropical plant care and how to run a small business. In December 2020, after a successful month-long holiday pop-up selling plants at Legacy Place in Dedham, customers began asking how they could continue to support her. That's when Emerald City Plant Shop—a name that comes from her love of all things green and her emerald birthstone—was born.

Turner says the rewards of running a small business are many, as are the challenges.

"Because it all came kind of fast, the finances can be difficult," she says. "I've been able to crowdfund the money I need to keep it running, but we're a self-funded business. Without access to capital, sometimes that can be a struggle." She also had to learn how to navigate the industry, which meant incorporating as an LLC so she could connect with the massive nurseries in Florida that supply her plants.

A distinctive element to Emerald City Plant Shop is that it also serves as an event space that can be rented out for use by community groups or private businesses.

"Being a Black woman is very much part of my identity, and creating a space that is inclusive of everyone is at the core of what Emerald City is," she says. While a student at WPI, she was a member of such campus affinity groups as the National Society of Black Engineers and the Black Student Union, which showed her "the importance of building community in places that weren't necessarily designed for us."

To help other Black professionals in Boston, she became a lead organizer of the Boston Young Black Professionals as a way to make friends, network, have fun, and give back to the community. Now more than 2,000 members strong, the organization has sponsored events such as Boston's Black-owned Business Pop-Up Market, monthly networking events, trips, and parties, and opportunities for community service.

Turner plans to open another shop in Massachusetts before branching out to other major cities—such as Chicago, Atlanta, and Washington, D.C.—where she realizes "there aren't many plant shops, let alone Black-owned plant shops," she says.

She says the lessons she learned at WPI—especially how to work in groups—continue to shape her.

"WPI taught me to think comfortably on my toes, pivot quickly, and problem solve. That has definitely helped me as an entrepreneur," she says. "WPI was almost like a boot camp for entrepreneurship."

—Kristen O'Reilly

PHOTO BY JOHN GILLOOY



“I’m glad I can follow in my mother’s and father’s footsteps to WPI; they’ve been such great role models for me, and I hope I make them proud.”

—Karl Schletzbaum '25

PHOTO BY AJ HSU

A Pair of Role Models in the Schletzbaum Family

It’s one thing to follow in one parent’s footsteps to WPI. But **Karl Schletzbaum '25** has the distinct pleasure of following in both parents’ footsteps. Like his father, Roy Schletzbaum '95, Karl chose WPI for its strong engineering program and its competitive athletic program. The first-year mechanical engineering major recently shared how happy he is to be a WPI student.

“I am so glad that I chose WPI; I have met so many great people in my classes, on the soccer team, and through other activities around campus,” he says. “I’m glad I can follow in my mother’s and father’s footsteps to WPI; they’ve been such great role models for me, and I hope I make them proud.”

As a senior project manager with Jacobs Engineering, Roy manages a wide variety of projects, predominantly for the Massachusetts Department of Transportation (MassDOT) and the Massachusetts Bay Transportation Authority (MBTA). Specializing in highly complex projects that require intensive multidisciplinary coordination, he attributes his ability to assemble successful teams, work effectively in teams, and complete jobs on time to the project-based education and wrestling team experience he gained at WPI.

“When working on projects like the rehabilitation of the Longfellow Bridge or upgrades to the mechanical and electrical systems of the Sumner and Callahan Tunnels in Boston, my experience with WPI’s short, high-pressure terms was great preparation for my professional career—as we often work on short deadlines and need to be able to complete projects accurately and on time.” When asked how the senior Schletzbaum felt about his son Karl attending WPI,

he says: “I am proud of Karl’s achievements and am fully supportive of his academic and athletic goals. I just want him to continue the success he’s had during his youth and continue to grow into a successful adult.”

Lisa (Cigal) Schletzbaum '95 works for the MassDOT as an assistant state traffic engineer. She recalls attending a two-week Frontiers program at WPI following her junior year in high school and knowing at that time WPI was where she wanted to call home after graduation. She applied early decision and says she “... never looked back. Almost 30 years after my first traffic engineering class, I am still loving my career in traffic and safety engineering.”

Like her husband, Lisa also attributes her WPI education, in part, to her ability to help develop roadway improvements and increase roadway safety for all. Sharing how the project-based work at WPI has served her well in her career, she says, “Oftentimes, safety improvements compete with environmental concerns—like keeping mature trees or wetlands, right-of-way constraints, utility conflicts—but there isn’t an opportunity to include it all. WPI taught me how to work as a team member to determine what solution is best for the challenge.”

“I’m filled with pride having Karl enrolled at WPI. It is special for me and Roy to have this bond with him. His journey, while similar to ours, will be uniquely his own, and we are enjoying watching him grow and succeed.”

—Sira Naras Frongillo

Heather and Hal Jurist '61: Preserving the World for Future Generations

Hal Jurist and his wife, Heather, aspire to make an impact on some of the world's greatest problems: climate change, world poverty, clean and accessible energy solutions, pandemics, and access to healthcare. One way to advance these issues is through government action, Hal says, and another is through universities.

"Heather and I feel strongly about preserving the world we live in. We believe universities have the power to shape the world," he says. "We're hopeful that by giving to universities, they'll work on the issues we care about."

To that end, the Jurists have made a significant seven-figure contribution to *Beyond These Towers: The Campaign for WPI*, advancing WPI toward its \$350 million philanthropy and overall \$500 million goals.

Their gift will advance faculty research by establishing an endowed deanship through a bequest as well as by funding the Harold L. Jurist '61 and Heather E. Jurist Dean's Professors. Distinguished faculty who are named the Jurist Dean's Professors are pursuing cutting-edge research in one of WPI's multidisciplinary concentrations focused on the smart world: robotics, decision-making/autonomous robots, cyber security systems, biomedical devices/image analysis, climate change, sustainable fuels/energy, environmental science/adaptation, and other disciplines closely aligned with these research areas.

The first Jurist Dean's Professors were announced this fall: Emmanuel Agu, computer science professor; Danielle Cote, mechanical engineering assistant professor; Dmitry Korkin, computer science professor; Pratap Rao, mechanical engineering associate professor; Carolina Ruiz, computer science professor.

"This generous gift from Hal and Heather Jurist recognizes the School of Arts and Sciences' leading researchers in artificial intelligence, machine learning, and biomedical data analytics," says Jean King, the Peterson Family Dean of Arts and Sciences.

Carolina Ruiz is an expert in machine learning, artificial intelligence, and data mining, who is a founder and core member of the Bioinformatics and Computational Biology Program, the Data Science Program, and the Neuroscience Program at WPI. Emmanuel Agu's research in the areas of computer graphics, mobile computing, and wireless networks—with a particular focus on using smartphones to deliver better healthcare—has received funding from the National Science Foundation, the National Institutes of Health, DARPA, the U.S. Department of Education, U.S. Army Research Labs, Google, and others. Dmitry Korkin's interdisciplinary research spans the fields of bioinformatics, computational genomics, systems biology, and biomedical data analytics—a recent example of which is the structural 3D roadmap of the novel coronavirus that he and his team created and shared with the scientific community.

"These three researchers exemplify cutting-edge and multidisciplinary scholarship in the expansive field of smart world research," says King. "We are beyond appreciative to the Jurist family,"

"I'm deeply grateful to Hal and Heather Jurist for this gift which will allow us to recognize the accomplishments of our faculty," says Bernard M. Gordon Dean of Engineering John McNeill, noting that Danielle Cote's work in advanced manufacturing has brought funding and visibility for WPI across several fields, for industrial as well as defense applications. Pratap Rao is investigating advanced materials that can be applied to solar energy conversion, catalysis, printed electronics, and sensors. "In different ways, both of these researchers are developing technologies that will improve people's lives now and in the future."

Hal Jurist credits his WPI education with giving him the means now to make this transformational gift to his alma mater.

"When I look back on my career, I know that I could not have accomplished all that I did without a solid education," says the electrical engineering major.

After graduation, Hal embarked on a long and impressive career with IBM. He was one of the first engineers in its components division and worked in and held management positions in several of its semiconductor laboratories before becoming development manager in a new business unit that would eventually become IBM's PC division. He also lived in Tokyo, managing IBM's telecommunications business in the Asia/Pacific Region. Along the way, he spent two years in the military (he was in ROTC at WPI) at Philadelphia Air Defense. He later took a position overseas with a large electronics firm, where he served as senior vice president, COO, and director. He concluded his career as a land developer in Florida.

Heather also had a successful career at IBM, joining the company after she met Hal. She was a technical writer and editor and later became a systems engineer. A graduate of Newcomb College at Tulane University and Florida Atlantic University, where she earned a master's degree in linguistics, she was blessed with a near-photographic memory and a special talent for languages, Hal says. He proudly notes that Heather could speak five languages and understand seven before an accident robbed her of some of these skills.

Now the Jurists enjoy retirement in Florida and consider their legacy. Heather has made a similar gift to Tulane University. Through their philanthropy, they also hope to inspire others and help researchers generate interest from other funding sources, such as federal and private grants, for their work.

"We hope to make the world better for future generations," Hal says.

— Judith Jaeger



“As BIPOC students are included and we invest in them with the distinctive education that WPI has to offer, we will change the world for the better. I believe that the Alumni of Color Association has a vital role to play in helping us become the welcoming, inclusive, and representative community of which we dream.”

—Debora Jackson

Alumni of Color Association Honors Debora Jackson With Scholarship Fund for BIPOC Students

With an understanding that a diverse university community facilitates intellectual engagement, collaborative citizenship, and enhanced cognitive skills, a group of determined WPI alumni formed WPI's inaugural Alumni of Color Association (ACA). Co-founders **Veda Booth '18** and **Lailah Thompson '16** launched the ACA in fall 2020 as a direct response to the racial injustices witnessed around the country over the previous summer. From scholarship and grant funding for students, to leveraging networking opportunities and connections for alumni, the association established three pillars professional development, advocacy, and philanthropy—to help ensure continuous sources of support for WPI students and alumni of color.

The ACA's first order of business was to establish an endowed fund to support students of color. Recognizing Dean Debora Jackson's work with WPI's Black and Indigenous People of Color (BIPOC) community, the association established the Dr. Debora Jackson Endowment for BIPOC Students in her honor. As one of the first women of color members of the WPI Board of Trustees, a 2019 Hall of Luminaries Inductee, current dean of The Business School, and a double-degreed alumna (ME '00, MS '89), Jackson was the perfect embodiment of the ACA's legacy at WPI. Although the fund is not yet fully endowed, ACA co-president Booth, a marketer with Goldman Sachs, looks forward to a day when the fund can support every BIPOC student who attends WPI.

When asked about learning of the proposed endowed fund, Jackson says, “When Lailah told me the ACA wanted to name the new endowment fund after me, I was stunned and completely humbled. It is still stunning and humbling. My desire is to make a difference in the lives of others and add value. I do not think about taking credit, preferring to celebrate the accomplishment of others. But to have recent alums look at me and my work as something to lift and recognize still leaves me without words.”

Jackson is committed to the ACA, saying, “Alumni of color understand the unique challenges at WPI, where there is an underrepresentation of diverse voices, experiences, and opinions. The ACA is positioned to advocate for current students because they understand the difficulties that students of color must navigate at WPI. They are also effective advocates for promoting the need for BIPOC faculty and staff, because students need to see leaders who look like them in the classroom and on campus.”

As WPI continues to transform lives, confront global challenges, and turn knowledge into positive impact, university leaders are prioritizing building an inclusive and supportive community where all members feel a strong sense of belonging. Through *Beyond These Towers: The Campaign for WPI*, the university will double down on its efforts to prepare strategic thinkers and build an inclusive, supportive, and welcoming community. The aim is to create a campus community where prospective and current students, faculty, and staff see themselves—where everyone feels a strong sense of belonging and has opportunities to achieve their full potential. Both the ACA and the Dr. Debora Jackson Endowment for BIPOC Students are in alignment with these commitments.

In closing Jackson offers, “I want to see students from all ethnicities and backgrounds come to WPI and find a home on The Hill that is a place of welcome. I want our students to thrive in an environment where their talents, gifts, and abilities are celebrated. And I do not want financial need to be a burden. We can make equity and inclusion a reality if we make supporting this endowment and other similar vehicles designed to meet need a priority.”

To help support the Dr. Debora Jackson Endowment for BIPOC Students, visit support.wpi.edu/campaigns/dr-debora-jackson-scholarship.

—Sira Naras Frongillo



CLASSNOTES

submit yours to CLASSNOTES@WPI.EDU

1953

David Hathaway writes, “As a survivor of 90 years, I am amazed because of the dangers I faced in my life. I have scars from first jumping out of the baby carriage and more scars from other scary things, but NO scars from learning to fly in Panama, nor a year in the war in Vietnam, nor even a scar from 37 years of wonderful adventure motorcycling, (seven great trips with my son on my second bike).

“Recently survived a bout of aplastic anemia. Doctors gave me a 50/50 chance of survival. I made that and got a new hip at 89. COVID has really restricted movement at my Senior Living Retirement—Carleton Willard Village. Now using YouTube—I listen to classical music, fly large planes, and even take wild motorcycle trips ... vicariously. I would like to hear from my surviving classmates what their life is like now. Email me, please: hath31@juno.com.”

1958

Norm Taupeka and **Stan Graveline** write, “... hosted (sort of) our 20th annual Cape Cod WPI season-ending gathering at Sesuit Harbor in Dennis on Sept. 19. The outdoor gathering with picnic tables near the water, all kinds of seafood and much wine was a great time. Other attendees were **Mike Stephens '57, Charley Stasey '57, Joe Gill '58, Roger Jolicoeur '58, Solon Economou '58, and Gene Graveline '58 (honorary), Al Levesque '59, Paul Sledzik '61, Ron Pokraka '60, and Mike Davis '62.**”

1966

Don Peterson writes, “My wife, Judi, has Alzheimer’s and we have been on the Alzheimer’s ‘Trail of Tears’ for the last 16 years. Fortunately, I retired from IBM at age 55 and our first 15 years of retirement was a grand adventure together before Alzheimer’s began to interfere in a serious way. Had I waited another 10 years to retire, most of that adventure would never have happened.

“Early in our retirement adventure we were full-timers in a 38-foot motorhome for five years and we drove across the USA 19 times. Four of our eight grandkids have crossed the country with us on various trips. For the last three years, Judi has been living in an Alzheimer’s Memory Care Facility. In March 2020 I got locked out of the facility—for a year I connected with her on FaceTime for about an hour almost every day. Since she can’t have a conversation, I sang to her instead. In March 2020 it was the subject of two short human interest stories on two local TV stations that were running stories about how people were connecting with their loved ones during the COVID lockdown.”

1969

Don Casperson was recognized as a “living treasure” in Los Alamos County, N.M. As a devoted Kiwanis member who has had a tremendous impact on kids in Los Alamos County,



▶ DON CASPERSON '69

he has not only promoted service to the community with kids, he has promoted STEM education through numerous science fair judging. Philo Shelton '87 writes, “I met Don through Kiwanis and learned we are fellow alumni of WPI. He is a humble man and he would not let others know of this major recognition.”

1972

Stephen Wilkinson writes, “Retired from Gillette and Amgen and living in The Villages, Florida. Doing lean consulting to help businesses improve efficiency and productivity. In The Villages,



▶ RAJESHWAR NARAIN MATHUR '73



▶ JAY SCHNITZER '73

I'm a member of the Community Emergency Response Team and the Red Cross. Who else is in The Villages? Contact ameritrans@aol.com."

1973

Rajeshwar Narain Mathur (PhD PH) writes, "Motivated by reading others' notes and my own desire, I am jotting down a few words. My education at WPI has helped me in rising to the level of Professor of Physics. I have enjoyed working in several teaching and R&D institutions. Also, I contributed to the launching of the Indira Gandhi National Open University (IGNOU), which is now one of the largest in the world. I am retired for some years now and spend quality time with my grandchildren. In order to exercise my brain muscles, I sometimes go to the nearby college to tutor, which is provided free to the students."



▶ JUDY NITSCH '75

Jay Schnitzer is senior vice president, chief medical and technology officer at MITRE, managing more than 200 independent R&D programs annually. MITRE president Jason Providakes said, "Over the last 18 months, Jay's leadership and expertise co-leading the COVID-19 Healthcare Coalition with Mayo Clinic have been unparalleled."

1975

Vicki Cowart, president and CEO of Planned Parenthood of the Rocky Mountains, has announced her retirement. **Judy Nitsch** was elected and installed as chair of the Boston Architectural College Board of Trustees in September. Now retired, she is founding principal of Nitsch Engineering, the largest women-owned business enterprise civil engineering firm in Massachusetts. She says she's proud that the company has completed projects on over 90 college campuses across the United States. A tireless mentor of female engineers, Judy served on the WPI Board of Trustees for over 20 years.



▶ DAVE HUHTALA '80

1977

Mike Abrams recently visited **Steve Mezak '78** at his home in Reno, Nev. He writes, "Steve and I were housemates in an Ellsworth apartment during the '75-'76 school year. We spent a fun weekend catching up and reminiscing about the fact that six of us managed to live in E04 without killing each other! Steve is still working a bit at consulting and business development in the software industry. I am retired after 40 years of designing seismic data acquisition systems, analog circuit design, and digital signal processing."

1978

Patrick Donahue reports that he is starting a new position in the field of nuclear medicine. **Rob Pierce** writes, "Pleased and honored to be back on campus to watch my youngest son (Michael) graduate with the Class of 2020. A beautiful day, an inspiring group of young

men and women crossing Earle Bridge and out into the world."

1979

Steve Rusckowski was recently inducted into the New Jersey Business Hall of Fame, among several who have consistently demonstrated throughout their professional lives high ethical standards, mentorship, community involvement, and innovative leadership.

1980

Dave Huhtala and his wife, Kathie, welcomed their first grandchild in August 2021. Casey David Meszaros was born in a hospital room overlooking campus, so his mother, Abby, predicted that he would be attending WPI as a proud member of the Class of 2043.

1982

Michael LaFleur reports that Songalong, a tool he created with

Anthony Topper '20 to automate virtual music performances, was used in a production that won an Upper Midwest Regional Emmy Award. The chorus in which he sings, VocalEssense, produced the holiday special "Welcome Christmas with VocalEssense," which aired on Twin Cities Public Television in December 2020. The show won in the Entertainment-Long Form category.

According to a story published by WPI in June 2021, "The Songalong platform enables a conductor to upload sheet music and to create or upload accompaniment, conducting, and part-dominant tracks. This process allows performers to see and hear everything they need to perform using only a single device. The work of each individual performer is collected into a single repository available to the conductor. The conductor selects the video and audio tracks they want to use for the production, and all performances are automatically synchronized into one rendering."

Watch "Let the River Run": www.youtube.com/watch?v=TIPW3I7n42w

Scott Mathews writes, "After seven-and-a-half extremely rewarding years as a line manager at Jet Propulsion Laboratory, I have returned to project work. In what may be the closing chapter of a richly fulfilling career, I have accepted the position of lead systems engineer for mechanical integration/ground support equipment on the Mars Sample Return-Sample Retrieval Lander (SRL) project, the program element being managed by JPL for the Mars Sample Return campaign. The SRL mission's goal is to retrieve the rock and soil samples currently being

collected and cached by the Perseverance rover, place them into a Mars Ascent Vehicle (MAV), and rocket them into Mars orbit. Once in orbit, the samples will be transferred to an Earth-return vehicle for a journey back home, and re-entry in New Mexico. SRL launch is currently scheduled for 2028. I look forward to completing my career 'in the trenches,' working on this amazing mission, and so proud to carry my WPI roots with me into this role."

1986

Scott Brazina has been appointed president and Board of Directors member at SquadLocker, Warwick, R.I.

1987

Tunji Taiwo has been elected to Wikoff Color's Board of Directors. Founder and managing partner of Tratus Group, he is currently serving as the chief digital officer of JEM Advisors.

1992

David Andrade has been promoted to business development manager, Google Services, at CDWG, where he is responsible for working with internal teams and customers on their Google (Workspace and Chrome) projects and services around them. He spent 10 years as an engineer before getting into educational technology and was CIO for the Bridgeport Public Schools before joining CDWG in June 2015. He also spent 22 years as a paramedic and EMS instructor—starting at WPI with WPI EMS—before retiring with a back injury. He was a NYC 9/11 responder as well. He lives in

Stratford, Conn., with his wife, Cori, a high school science teacher, their daughter Abby (8 years old) and their cats.

David Cortese has been named to the board of EspriGas, an industrial gas company.

Teresa Duprey was promoted to vice president and is leading technology delivery for the Travelers Insurance Claim Analytics Value Stream; she is also program lead for the Technology & Operations Culture Journey at Travelers. She lives in West Hartford, Conn., with her husband, Kevin Duprey '91. They have three children—Elliot is a senior at the University of Chicago, Ava is a sophomore at Boston College, and Aleksandr is a sophomore in high school.

1994

Ted Dysart was named (for the 14th year) to the National Association of Corporate Directors Directorship 100 for his "exemplary leadership in the boardroom."

1996

Joseph Marais, co-chair of Burns & Levinson's Intellectual Property Group, has been named a Go To IP Lawyer by *Mass Lawyers Weekly*. The list recognizes the top intellectual property lawyers in the region—the ones other lawyers refer clients to because of their expertise, accomplishments, and creative thinking. He received his J.D. from Suffolk University Law School.

1997

Eric Amodio, creator of GitLens, has joined GitKraken as its chief technology officer, leading both companies' suite of collaboration



▶ ERIC AMODIO '97

and productivity tools.

1999

Chris Cammack and his wife, Jaime Cammack, welcomed their fifth child, a boy named Christopher Corbinian, in Hanover, N.H., on Sept. 2, 2021.

Aswin Phlaphongphanich was awarded "Under 50 Financial CEO of the Year in Thailand" by *International Investor Magazine*.

2002

Jody Staruk was honored by Habitat for Humanity MetroWest/Greater Worcester with its 2021 Golden Hammer. She joined Consigli Construction Company in 2003 as a project engineer and was promoted to its first-ever female project executive in 2017. She recently completed the YWCA of Central Massachusetts facility renovation, where she led Consigli's first-ever all female team.

2005

Amit Diddie has been promoted to director of product management at AdminaHealth.



▶ VICTORIA KAHLER '21 AND JOHN BENDA '01

2012

Daniel Roop was honored as a 2021 Young Professional of the Year by the American Council of Engineering Companies of Massachusetts, which recognized his accomplishments by highlighting his “interesting and unique work, and its resulting impact on society. Since joining Tighe & Bond in 2012, he has become a standout leader among his peers, a top new-hire recruiter, and an integral part of our Water

Business Line. As an environmental engineer, he specializes in coastal resiliency for water and wastewater infrastructure.”

2020

Daniel Peláez and **Bryan Licciardi '03** were featured in a *Telegram & Gazette* story about Roadgnar, a remote sensing technology company founded with fellow alumni **Noah Parker '21**, and **Noah Budris '20**. According to the story, the company is “testing the beta version device that they hope

will help the city [of Worcester] map out and monitor infrastructure conditions for assets such as pavements and sidewalks in real time. The device uses various sensors to collect data including light detection and ranging (LiDAR) technology.” In January 2022, the company announced it was changing its name from Roadgnar to Cyvl.ai.

2021

Victoria Kahler, midshipman in the U. S. Navy Holy Cross Battalion,

was presented with the Massachusetts Bay Council sword award for outstanding leadership by **John Benda '01**, commanding officer of the USS *Constitution*, who was also a member of the U. S. Navy Holy Cross Battalion when he attended WPI. The ceremony took place during the ship's first harbor cruise in 18 months and just before the long-awaited afternoon reopening to public visitors.

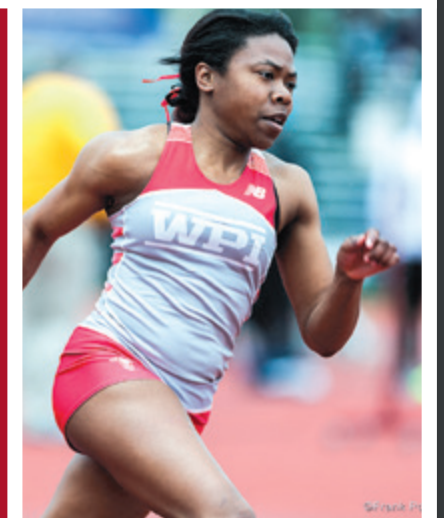


GOAT NATION NEEDS YOU!

Gifts from alumni, parents, and friends during the Goat Nation Giving Challenge support the Athletics Department, and all of WPI's varsity athletic teams, coaches and student-athletes. Donations to Goat Nation 2022 will help purchase new equipment, fund leadership opportunities, and help return WPI's teams to the field and courts for the spring season!

THE GOAT NATION GIVING CHALLENGE IS COMING IN MARCH 2022. WILL YOU RISE UP?

wpi.edu/+give





[IN memoriam]

George Fetherolf, Jr. '44 ME, Hilton Head Island, S.C.
John Barrett '46 CE, Plymouth, Mass.
Otto Kern '48 CE, SIGMA ALPHA EPSILON, Hampden, Mass.
Richard Seagrave '48 ME, SIGMA PHI EPSILON
Donald Sands '51 CH, Lexington, Ky.
Robert Meyer '52 ME, THETA CHI, Stidell, La.
Robert Chiabrandy '53 ME, Burlington, Vt.
Charles Simonich '54, PHI KAPPA THETA, East Longmeadow, Mass.
Henry Manseau '55 EE, ALPHA TAU OMEGA, Scarborough, Maine
Robert Pearce '55 EE, Juno Beach, Fla.
Joseph Cimerol '56 CHE, Hamden, Conn.
James Clarke '57 CHE, THETA CHI, Stone Mountain, Ga.
John Stinson '57 CE, SIGMA PHI EPSILON, Hanover, N.H.
Richard Wright '57 EE, SIGMA PHI EPSILON, Plymouth, Mass.
George Prozzo '57 EE, Sarasota, Fla.
George Fotiades '59 EE, SIGMA ALPHA EPSILON, Shrewsbury, Mass.
Robert Price '59 ME, MSME, SIM, St. Augustine, Fla.
Douglas Farrand '60 CE, ALPHA TAU OMEGA, Maumee, Ohio
Harold Schmidt '60 CHE, SIGMA ALPHA EPSILON, Hopkinton, Mass.
Kenneth Anusavice '62 ME, Saint Augustine, Fla.
William Belanger '62 MNS, Millbury, Mass.
Raymond Coppa '64 MNS, Cranston, R.I.

Robert Shaughnessy '64 MNS, Fitchburg, Mass.
James Ratches '66 MS PH, PhD PH, Alexandria, Va.
Charles Bergeron '67 EE, PHI SIGMA KAPPA, Saco, Maine
Anna Granquist '67, Holden, Mass.
Thomas Ricchi '67 EE, THETA CHI, Parrish, Fla.
Todd Akin '70 MG, PHI GAMMA DELTA, Wildwood, Mo.
Elden York '70, EE, SIGMA ALPHA EPSILON, Daytona Beach, Fla.
Arthur Geetersloh '72, Greenville, Maine
Vahe Krikorian '72 ME, THETA CHI, Milford, Mass.
Lester Lier '75, Princeton, Mass.
Brian Burd '95 ME, Milford, Mass.
Brett Keisling '95 ME, Hilton Head Island, S.C.
Ryan Byrnes '97 MGE, SIGMA PI, West Bridgewater, Mass.
James Wang '03 CS, San Jose, Calif.
Ronan Banavige '23, Maple Plain, Minn.
Deborah Coleman, Hon. PhD, Portland, Ore.
Valentin Gapontsev, Hon. PhD, Worcester, Mass.

The WPI community also notes the passing of these friends of the university: **Geraldine Miller, Elizabeth Tomaszewski, and Andrew Ursch.**

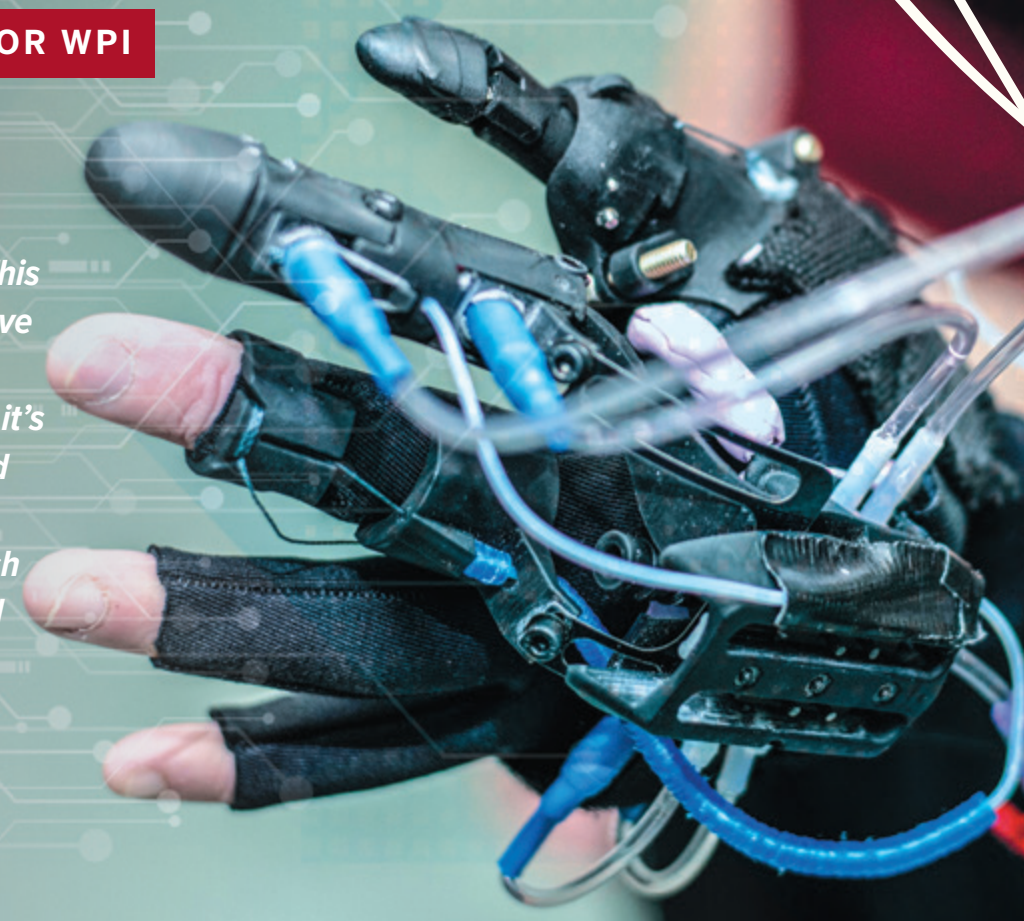
Complete obituaries can usually be found online by searching legacy.com or newspaper websites. *WPI Journal* will assist classmates in locating additional information. Contact wpijournal@wpi.edu.

BEYOND THESE TOWERS

THE CAMPAIGN FOR WPI

"I am so grateful that people donate to WPI—seriously, so grateful. This project just wouldn't have been able to happen without donations. And it's through the support and the trust of donors that we're able to accomplish projects like these—and great things across the world—and get WPI's name out there."

Mia Buccowich '22
 Biomedical Engineering
 MQP: Developed a Robotic Partial-Hand Prosthetic



Beyond These Towers: The Campaign for WPI will help more students like Mia—the global problem solvers, innovators, and leaders of tomorrow—access our time-tested approach to learning and take their first steps toward a world of possibilities.

Beyond these towers are students who have everything it takes to be at WPI, except the means.

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