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IN MEMORY OF ALUMNI, FACULTY, AND OTHER MEMBERS OF THE WPI COMMUNITY
WILLY EGGIMANN
It was wonderful to see the story on Willy Eggimann’s WPI career in the WPI Journal. Willy was a great colleague in the Electrical and Computer Engineering department. And while he was, as the story says, “a longtime associate professor,” I want to point out that Willy’s many contributions to both WPI and the ECE profession were recognized by his promotion to the rank of full professor, and that he retired as professor emeritus.

— John A. Orr
Professor Emeritus of Electrical and Computer Engineering
WPI Adjunct Teaching Professor

STRUCTURAL LESSONS FROM 1950S STILL HOLD
One afternoon in Kaven Hall, more than 60 years ago, almost all the students in Prof. Carl Koontz’s structural design class were half asleep after a good lunch. Koontz, coming in cheerfully with a long measuring tape, pushed all of us into a corner area of the classroom. Then he measured the area of the floor where we all were standing – but not dancing. He looked up at us to be sure of the number of us. Koontz then smiled, thanked us, and started his class.

If Koontz’s live load data, plus required safety factors for dancing impact had been used in the design of that collapsing floor [where 30 Clemson University students were injured last fall], this world will be a better place.
It was his finest hour. Thank you, Koontz.

— Boakfar Ketunuti ’57

Letters to the editor may be altered for length, clarity, and accuracy. We ask that letters offer the reader’s opinion without rumor. Letters that mock or insult will not be published. Opinions expressed do not necessarily reflect the views of WPI. Send your letters to wpijournal@wpi.edu.
PRESIDENT LAURIE LESHIN TALKS WITH DONNA LEVIN

LL Donna, welcome to WPI. It’s so great to have you here. Our readers may know you as the founder of Care.com, or perhaps as an entrepreneur-in-residence at MIT. Now you’ve joined us as our inaugural Executive Director of Innovation and Entrepreneurship, which to me is all about the third tower of impact at WPI. Tell us what you found when you came to WPI.

DL When I first arrived at WPI, I found a warm, welcoming community who were ready to have an impact upon the world. I found a number of fantastic programs already in place, plus a long list of great ideas — there’s no shortage of interesting ideas.

LL So many of those ideas will be enabled by this fabulous space we’re standing in right now, the Foisie Innovation Studio. Tell me how this building is beginning to manifest around this idea of impact.

DL This space is the embodiment of the entire WPI Plan, and it really comes across with our theme of open spaces, open minds, and open possibilities. There’s everything from amazing classes in the active learning classrooms, VR training in the global lab, plus hands-on classes in the maker space. It is so fantastic to see — day and night. When you walk into the building, there are students everywhere. They are truly figuring out how to leverage this innovation space to advance their ideas.

LL We brought you here to help them do exactly that, to help them facilitate translating their ideas to the world in an even more impactful way. Can you tell us a little bit about your early priorities as you start to move into your work here at WPI?

DL We recognize that innovation happens everywhere, so we’ll be doing a number of events to really unleash that potential and engage the entire community — that’s our number one priority. And then the second, equally important priority, is that students already arrive with amazing ideas. And in some cases they arrive and it’s like, “Hey, look at this flying car I built!”

LL We actually have a student who built a flying car! [See page 10.]

DL Yes? And we really want to help our students marry the frameworks they receive from faculty to provide timely, just-in-time skills that help them move forward. We hope to bring those innovations to life through the thousands of projects they do each and every year.

LL There’s so much opportunity to translate their skills to the world in even more impactful ways, and I can’t wait to see the work you do come to life here in the Foisie Innovation Studio. Thank you again, and welcome to WPI.

DL Thank you. I am thrilled to be here!
CELEBRATE YOUR PAST
ALUMNI WEEKEND: MAY 30 – JUNE 2, 2019

Special reunion events for undergraduate classes ending in 4 and 9

ONE alumni weekend

COUNTLESS memories
Every fall, when Nantucket has emptied of seasonal crowds, a second wave of visitors come ashore. But unlike the tourists who seek all the island has to offer, these WPI Project team members from WPI are focused on what they can offer the island.

WPI’s Nantucket Project Center was established in 2008. Since then, a symbiotic relationship has formed between island residents and the two dozen students who visit each B-Term.

“Often the students serve as a catalyst to enable them to do things they wouldn’t be able to do otherwise,” center director Dominic Golding says of Nantucket’s sponsors, which include municipal government departments and nonprofits.

There’s no shortage of issues affecting this island 25 miles off Cape Cod. Nantucket’s population of 12,000 swells to 50,000 during the summer. As a national historic district, its bylaws and regulations protect the island’s character, but can hinder efforts to accommodate seasonal demands.

Mechanical engineering major Angela MacLeod ’19 and her three IQP (Interactive Qualifying Project) teammates discovered this last year. Tasked with proposing improvements to downtown parking, they learned that the streets become congested with drivers searching for places to leave their cars. Parking meters and kiosks are not allowed in the historic district, and there isn’t room for parking lots. The group conducted interviews, researched parking solutions in other tourist destinations, and investigated different technologies. Their final report included recommendations for short-, medium-, and long-term solutions, including instituting a parking sticker system (its fees paying for increased shuttle bus services); expanding satellite lots and increasing capacity of current valet services; transitioning from an actual parking sticker to an RFID transponder; and, ultimately, moving forward with plans for a parking garage near the waterfront.

MacLeod and her teammates were struck by how interested the townspeople were in their work. “Whenever we interviewed people, they would want to know anything we found out and any ideas we had, especially technology-wise,” she says.

Island residents embrace the IQP students, according to assistant town manager Gregg Tivnan. Harvey Young of Young’s Bicycles gives each student and advisor a free bicycle to use during their seven weeks on the island. The Maria Mitchell Association (MMA) has provided dormitory-style accommodations for the past nine years; this coming year the students will be housed at the Nantucket Yacht Club. The organization ReMain Nantucket has supported the program in many ways—providing student office space to sponsoring projects, receptions, and an annual treasure hunt.

“It’s a great partnership on the island,” Tivnan says. “We look at them as fresh eyes to keep us on our toes.”

The MMA reaped the benefits of those fresh eyes last year. The association, named after the 19th century astronomer, wanted to help visitors find their way among its geographically dispersed buildings. The IQP team assigned to the project easily found its way to each building. The real problem, the students realized, was that it wasn’t obvious that the buildings belonged to the MMA and were open to visitors.

“Our perspective was, it’s not difficult to find you, but people don’t know what you do. That was our ‘Aha’ moment,” says robotics major Eva Barinelli ’19. The team’s recommendations centered around creating a strong brand identity and ranged from visually connecting the buildings through landscaping to creating guidelines for marketing material and signs. “It felt like we did something purposeful that they could actually use,” Barinelli says.

Golding says that many of the student recommendations are implemented or used as a springboard for further work. Tivnan agrees, noting that WPI IQP recommendations have been used to request Town Meeting appropriations and to send out requests for proposals.

“We wouldn’t have been able to jumpstart these projects without the students’ input. Their projects have always been excellent, relevant, and very well-received,” Tivnan says. “The students are well beyond their years, very thoughtful, creative, resourceful.”

— Sharron Kahn Luttrell
At the outset I thought I was well-informed, but soon came to realize that my awareness was partial and limited. The experience of women, people of color, or underrepresented minorities at WPI is different than my own. I have zero nostalgia for the smaller, all-male, all-white, and almost-all-engineering faculty and students of an earlier era.

—Sharon Gaudin

WASTE NOT, WANT NOT

If soldiers are fighting in a remote location and are short on needed parts for essential equipment, waiting weeks or even a month for a shipment to arrive might not be an option.

WPI researchers are working to enable the U.S. military to make the parts they need in the field, within a matter of hours or days, all by taking advantage of what otherwise would have been discarded scrap metal.

With a $1.15 million award from the Department of Defense’s Strategic Environmental Research and Development Program, Diran Apelian, Alcoa-Howmet Professor of Mechanical Engineering, and Jianyu Liang, associate professor of mechanical engineering, are working to increase military readiness by creating more self-sustainable war fighters.

The researchers, working alongside graduate students, are creating multi-step agile manufacturing processes that will use intelligent sorting technologies to locate needed metals within scrap piles, plus a mobile foundry to melt down and recast the recovered materials. Then they’ll use investment casting, a technique that creates a molded form around a pattern of wax, which, itself, can be made with 3D printing. The form is then used to cast the metal part.

The process from scrap to finished part could take as little as a few hours, and can be set up inside a trailer that can be delivered to the field via ship, aircraft, or truck, or even inside a large van.

If successful, the program being developed at WPI could be used throughout the U.S. military.

—Sharon Gaudin

QUOTABLE

“At the outset I thought I was well-informed, but soon came to realize that my awareness was partial and limited. The experience of women, people of color, or underrepresented minorities at WPI is different than my own. I have zero nostalgia for the smaller, all-male, all-white, and almost-all-engineering faculty and students of an earlier era.”

Humanities & Arts Professor Peter Hansen, director of the International & Global Studies program, on his involvement as co-chair of WPI’s Project Inclusion’s Rubric Steering Committee.
Paclitaxel, better known as Taxol, is widely used to treat ovarian, lung, cervical, and pancreatic cancers. Originally produced by processing the bark of the Pacific yew tree (it takes three one-year-old trees to produce enough drug for a single patient), most paclitaxel is made today by culturing cells taken from the needles of yew trees—a greener process, but one with a fairly low yield.

Chemical Engineering Department head Susan Roberts ’92 is working to boost that yield by harnessing the cell’s metabolic machinery. She says paclitaxel, which the yew makes to defend itself against fungal infections, is one of hundreds of compounds yew cells produce using a variety of metabolic pathways. Roberts has discovered that she can manipulate those pathways to get them to crank out more paclitaxel.

Funded by a $600,000 grant from the National Science Foundation, she and her research team use a bacterium known as Agrobacterium to transform the cell’s genome and redirect the cellular machinery. While other efforts have been made to genetically engineer yew cells to increase production, the changes have not proved stable and the cells have tended to revert to their old ways.

The novel techniques Roberts and her team have developed seem to have overcome that limitation, transforming cells in a reliable and stable manner. Roberts says the same techniques could be used to boost cell-culture production of other plant-based compounds that are important in medicine and other industries.

“By combining different strategies, especially using the genetic engineering tool we just developed,” she says, “we could expect multifold increases in production.”

—Sharon Gaudin

MISSION CONTROLLED

Picture this: Major Tom is orbiting the Earth in his 60-ton spacecraft. Suddenly, he relays some critical data points to NASA Ground Control. But Ground Control never hears the transmission because of persistent space weather.

Space communication is about to get a bit clearer. Bolstered by a $123,505 grant from NASA, WPI—working with the NASA Glenn Research Center in Cleveland and Penn State—has developed an algorithm that could lead to improved communication with the International Space Station (ISS) and future spacecraft.

The machine learning technique—called reinforcement learning neural network (RLNN)—uses artificial intelligence to help reduce or eliminate interrupted communications and guard against disruptions caused by space weather and other anomalies that can degrade radio links with Earth-orbiting and interplanetary spacecraft.

WPI electrical and computer engineering professor Alex Wyglinski, a principal researcher on the project, calls the new technique “a game-changer for performing wireless communications in space.”

The researchers are using the ISS as a testbed to evaluate their approach, which could have far-reaching implications for future space missions. WPI graduate student Max Li ’17 (ECE/CS) traveled to NASA Glenn over the summer to ensure that the computer code was working properly.

NASA uses the ISS, whose orbit is approximately 250 miles above Earth, to learn about living and working in space and as a testbed for future exploration missions. This particular research project is taking advantage of an experimental communication system on board the space station called the Space Communications and Navigation (SCaN) Testbed.

Wyglinski says the work of his team—including instrumental contributions by Paulo Ferreira, who earned his PhD in electrical engineering at WPI in 2017, and WPI math professor Randy Paffenroth—will be used as a framework by other researchers to improve “the technology readiness level” for a wide variety of space communications scenarios, including deep space missions.

Somewhere in outer space, Major Tom is smiling.

—Andy Baron
A NEW WIND STIRS LIFE INTO SCIENCE OF WILDFIRES

Around the globe large swaths of the landscape have been charred by wildfires this year, making the 2018 fire season one of the most devastating on record. With a warming climate stretching that season into a nearly year-round phenomenon in some places (in the American West, for example), the need to understand how wildfires start and spread, how to control them, and how to make structures at the urban-wildland interface more resilient to fire, is becoming ever more urgent.

Under the leadership of fire protection engineering professor and interim department head Albert Simeoni, whose own interest in wildland fires was sparked by his service as a firefighter in Europe, WPI has become a leader in the scientific study of wildfires. Simeoni directs experimental work that spans a range of scales, from the microscopic examination of pine needles and other wildfire fuels, to small-scale burns with these materials to document their combustion properties, to observations of controlled burns in New Jersey’s Pine Barrens.

This year Simeoni and his team gained a powerful new experimental tool: a 41-foot-long wind tunnel that can be set up under the massive hood in WPI’s 2,000-square-foot Fire Protection Engineering Performance Laboratory to conduct carefully controlled burns—essentially, simulated wildfires. Designed by Simeoni, FPE professor Ali Rangwala, aerospace engineering
professor at Notre Dame Seong-Kyun Im, and Notre Dame PhD student Giovanni DeCristina, with support from the U.S. Forest Service, the tunnel can also be broken down, packed into a truck, and reassembled outdoors to conduct controlled experimental burns in the field, something that has not been possible before.

The wind tunnel consists of a “diverging section,” where a series of screens and baffles smooth out the wind generated by four large fans, and an experimental section, where fires can be set and the burns observed through 7-foot-tall ceramic-glass windows. Instruments, including thermocouples and pitot tubes, collect data on temperatures, heat flow, mass loss, and wind speeds. Research in the tunnel is proceeding systematically. In this photo, the test section is filled with a thin layer of pine needles and leaves, to simulate the forest floor. Simeoni notes that wildfires begin and spread in this ground layer, so understanding the fire dynamics there is essential to constructing accurate models of wildfire behavior. Later, burns with shrubs and other vegetation, as well as field studies with the tunnel, will make those computational models more robust and predictive.

The ultimate goal of this work, like most of the fire science research conducted at WPI, is to help create a safer world. By helping firefighters better deploy resources and develop attack plans, fires can be better controlled and more property and lives saved. By gaining a better understanding of the interplay of fire, a changing environment, and the rapidly expanding urban footprint, we can plan better how to live with the ever-present risk of wildland fires and create more resilient communities. “A safer world must be built on a solid scientific foundation,” Simeoni says. “That’s what this research is all about.”

—Michael Dorsey
The sky’s where it’s at for first-year student Jeremy Elan Trilling. His initials – JET – signal his natural drive to create airborne vehicles. Before he was out of high school, he had launched JETpack Motors, an electric vehicle company, and co-founded MakeX, a Palo Alto free makerspace for teenagers. Although he hails from the West Coast, WPI stood out as the right place for a young innovator. “It’s a wonderful, whimsical place,” he says. “I wanted a strong focus on the things I am passionate about – which is making stuff.”

Before he officially became a WPI student, Trilling undertook a self-devised project: designing and building a flying electric vehicle, which he field-tested during the journey from his home in California to WPI. Accompanied by a traveling crew of friends and family – and borne along by a support vehicle – Trilling tested his vehicle on land and in the air during stops along the journey. When a steering column came apart during a test run, he whipped out tools and fixed it on the spot. In the end, he arrived at WPI with his self-described “pumpkin carriage,” which meets FAA standards for ultralight class. It can reach 5 knots (about 60 mph) and can soar at heights up to 18,000 feet or travel must above ground level. The cross-country journey confirmed that he had succeeded in his goal to design and build a working flying machine. Now on the ground in Worcester, the mechanical engineering major plans to scope out nearby airfields for more testing with professor of electrical and computer engineering and fellow aviator Fred Looft.

—Julia Quinn-Szcesuil
Q. I learned from a previous issue of the WPI Journal about the first female instructor in the 1860s. Was she the only female instructor at the time?

A. Harriet Goodrich holds the distinction of being WPI’s first female instructor, but she did not remain the only female on the faculty for very long. A year after Goodrich was offered a position teaching Elementary Mathematics, the Institute hired Marietta Fletcher on June 4, 1869. Tasked with instructing students in English, French, and German, Fletcher was paid a yearly salary of $1,200. In September 1870, the now Marietta Sinclair (she married Professor John Sinclair earlier in June of that year) requested a raise in salary, a courtesy offered to nearly all the other faculty—including her husband, but, in response, she was informed her raise was “not expedient in the present condition of funds.”

At a June 7, 1871, meeting of the WPI Board of Trustees, Marietta’s salary for the upcoming academic year was again set at $1,200. Three days later, after first attempting to meet him in his office, Marietta wrote to board member and founder Stephen Salisbury to inquire why her salary remained at the first-year level … “perhaps because I am a woman” [underlined for emphasis in original letter, below], she made clear that her teaching was rated satisfactory and that she was “abundantly able to maintain order in my room.” Noting that a gentleman could accomplish no more, she reiterates her request for a raise to $1,500 per year. The Board’s response, if any, is not recorded, but two weeks after her letter was dated, the Board increased her salary to $1,400 per year.

The Sinclairs remain on campus in spirit through the dedication of Sinclair Hall [third floor of Boynton Hall, chapel side] in 1926. To view Marietta’s original letter or to learn more about the history of women at WPI, visit Gordon Library’s Gladwin Gallery exhibit, “Women of the Institute: 150 Years of Women at WPI,” on display through July 2019.

Arthur Carlson, assistant director of Archives & Special Collections at the George C. Gordon Library, would be glad to answer questions you may have regarding curious facts and figures about WPI wonders. Send your inquiry to archives@wpi.edu.
Torn ACLs. Badly sprained ankles. Blown out knees. These injuries continue to sideline a growing number of recreational and professional athletes alike.

But there’s hope. A team of more than a dozen undergraduate and graduate students has developed a working prototype of a new kind of sports shoe designed to help prevent the incidence of non-contact knee and ankle injuries.

The team, led by mechanical engineering professor Christopher Brown, tested and evaluated preliminary prototypes throughout the summer and fall. They hope to produce about 10 pairs in campus labs by December for further testing on the court. A larger trial production run is expected in early 2019.

The shoe design received a U.S. patent in August 2017. Ed Cowle, an angel investor and CEO of New York–based Sports Engineering, Inc. (SEI), has invested in excess of $400,000 in the shoe project. SEI has an exclusive license to the patent, as well as future intellectual property. WPI holds equity and will receive royalties on the shoe.

The WPI team—building on previous student teams’ work dating back several years—separated the sole and the tread from a brand name high-top basketball sneaker. Next they affixed a thin layer of Teflon to the bottom of the sole and another layer to the top of the tread before inserting several “goat’s-head springs,” the key design element featuring tiny, flexible polymer pieces. The springs (a nod to WPI’s mascot—they resemble a goat’s curly horns), control the shear loads and deform so that the upper part of the shoe slides on the springs.

“The idea is that energy exerted when someone is running and cutting,” says Brown, “would end up being absorbed by the springs instead of tearing your ACL or spraining your ankle.”

—Andy Baron

LIPIDS FOR LIFE

For those who’d like to spend their senior years in active pursuits like riding bikes and gardening, Carissa Olsen, Leonard F. Kinnicutt Assistant Professor of Chemistry and Biochemistry, has one word: lipids. In her research, she explores how the lipids in our cell membranes, and the way those molecules change as we get older, may be the key to age-related health changes and diseases associated with aging, including Alzheimer’s.

Lipids are a key component of the membranes that surround our cells. These membranes form a barrier that protects cells and impacts their normal functions, like absorbing nutrients and producing energy.

Olsen has found that as animals age, the composition of the cell membranes changes and the rate at which those lipids are replenished slows. Olsen wants to know why these changes occur and how they are connected to the degradation that occurs in cell membranes over time.

With a two-year, $421,000 grant from the National Institutes of Health, she is seeking to learn more about how young animals maintain healthy cell membranes, and about what changes as the animals get older. She also wants to know whether it is possible for animals, including humans, to live longer and stay healthier as they age by stabilizing the composition of lipids in their cell membranes.

Olsen conducts her research using the tiny nematode Caenorhabditis elegans (C. elegans), whose short lifespan allows her to conduct numerous observation and experiments in a relatively short period of time. Because the structures and processes she is studying are common to all animals, her work will have implications for human health and aging.

She says, “This research asks the fundamental question: Why are we so good at being alive and healthy for a certain period of time and then things just fall apart as we get older?”

—Sharon Gaudin

SOLE PRACTITIONERS

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—Andy Baron
ALBUM RELEASE: SCOTT BARTON

SCOTT BARTON, ASSOCIATE PROFESSOR OF MUSIC AND ROBOTICS ENGINEERING, SAYS HIS LATEST ALBUM, STYLISTIC ALCHEMIES (RAVELLO RECORDS CATALOG #RR7990), "REPRESENTS THE DIVERSITY OF MY MUSICAL LIFE, COMBINING ELEMENTS FROM CLASSICAL, EXPERIMENTAL, POP, ROCK, AND ELECTRONIC MUSICS."

...AN ELECTROACOUSTIC BOX OF SURPRISES

Stylistic Alchemies wants to be, and is, more than electroacoustic chamber music—it’s a journey through the possibilities of artistic expression.

SCOTT BARTON, ASSOCIATE PROFESSOR OF MUSIC AND ROBOTICS ENGINEERING, SAYS HIS LATEST ALBUM, STYLISTIC ALCHEMIES (RAVELLO RECORDS CATALOG #RR7990), "REPRESENTS THE DIVERSITY OF MY MUSICAL LIFE, COMBINING ELEMENTS FROM CLASSICAL, EXPERIMENTAL, POP, ROCK, AND ELECTRONIC MUSICS."

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 1 will be installed prior to Commencement.

wpi.edu/+bricks
Distinguished researchers who tackle some of the most critical environmental challenges of our time joined the WPI faculty in the fall to fill two endowed professorships.

**Jennifer Wilcox**, the James H. Manning Professor of Chemical Engineering, is known for her research on methods for capturing CO₂ from power plant emissions, and her even more novel visions for what she calls “negative emissions,” or pulling CO₂ out of the air with large-scale “synthetic forests.” In a 2018 TED Talk, she said removing CO₂ from the air may be the only viable means of reversing the trend of human-aided climate change.

Wilcox returns to WPI following appointments at Stanford University and Colorado School of Mines. She is the author of *Carbon Capture* (Springer Publishing, 2012), the first engineering book and the first textbook on the subject.

**Harold Walker**, the Alena and David M. Schwaber Professor of Environmental Engineering, comes to WPI from Stony Brook University, where he was the founding director and chair of the Department of Civil Engineering. Walker explores new treatment technology for wastewater and drinking water.

The author of *Harmful Algae Blooms in Drinking Water: Removal of Cyanobacterial Cells and Toxins* (CRC Press, 2015), he developed methods for removing nutrients, like nitrogen and phosphorous, from water supplies, where they can stimulate toxic algae blooms and create low-oxygen “dead zones.”

Learn more: wpi.edu/meetwilcox and wpi.edu/meetwalker

**TRACING THE COMPLEX PATTERNS OF DISEASE**

The more scientists look at the molecular and genetic underpinnings of disease, the more complex that picture appears. It once seemed that a fairly simple line could be drawn between genetic mutations and disorders like cancer and diabetes; now it’s known that the pathway is not linear at all, but is instead an intricate web of molecular interactions involving genes, RNA molecules, and proteins. Understanding those interactions could yield profound insights into why some people with particular sets of mutations become sick and others don’t, or why some cancer patients respond to treatment and others see no improvement.

Sussing out the intricacies of complex molecular networks in the laboratory can be extremely time consuming and expensive, notes computer scientist Dmitry Korkin, who directs WPI’s Bioinformatics and Computational Biology program. He believes that an artificial intelligence technique known as machine learning can help by sifting through the vast amount of data about molecular interactions in the cell that are now becoming available and creating computational models can trace those interactions, determine how genetic mutations may disrupt them, and then make predictions about the ultimate impact of those mutations. His research is funded by a two-year, $347,000 award from the National Institutes of Health.

Korkin says the computational tools he is developing reflect some emerging ideas in molecular biology that are changing the way we look at the machinery of disease. For example, it is becoming clear that examining how proteins interact in cells can reveal more about the onset and progress of diseases than simply knowing whether particular mutations are present. “In fact, understanding just the mutations associated with a disease tells us very little about the functions those mutations affect,” he says. “With our new NIH award, we will have the resources to take our machine learning tools to the next level and help contribute to the most exciting new areas of biology and personalized medicine.”

—Michael Dorsey
Can you explain what MS4SSA is and how it works?
Math and Science for Schools in Sub-Saharan Africa was launched by the World Bank in 2016, and offers countries assistance to enhance learning outcomes in STEM subjects among primary and secondary school students. The team at WPI focuses on giving entire school systems the tools they need to succeed. We provide trainers from regions across Africa updated content knowledge, classroom pedagogical practices, teaching materials, and tools. We also offer continuing guidance, mentoring, and technical support.

We connect the training of trainers and teachers with the training of students. This is a sustainable and scalable approach that can be employed in any community or country. In our case, by working with the governments of 18 African countries, we are hoping to use digital training approaches and project-based learning to prepare the next generation of Africans who can use STEM to develop their countries.

Why is this work so important to you personally?
I believe that STEM education has the potential to transform the lives of every African boy and girl in ways that could empower them to use science and technology as engines of African development. As a young boy in Nigeria, I was given the opportunity to get a good education that provided me a strong foundation on which I built my career as an engineer and educator. However, large numbers of African youth are struggling in mathematics and science. A lack of highly trained teachers in STEM fields is one reason for this systemic problem; a lack of knowledge and collaborations that cross boundaries, both geographic and socio-economic. Solutions require the creative minds of people with varied backgrounds and perspectives. This is where WPI’s approach to education is most notable. We recognize that there is not a one-size-fits-all approach to teaching and learning. By engaging representatives from a wide range of areas, we can identify the best approach to lasting STEM engagement. Together we are training and inspiring the next generation of leaders in this field and promoting important collaborations between engineers and scientists in the United States and Africa.

— Colleen Wamback
Jagan Srinivasan  
Associate Professor, Department of Biology and Biotechnology

SCIEN CE TEXTBOOKS  
NEUROSCIENCE. I BELIEVE THAT IT IS ONE OF THE MOST EXCITING BRANCHES OF SCIENCE. WHY? BECAUSE OUR BRAINS ARE UNIQUE, AND THEY DEFINE WHO WE ARE. UNDERSTANDING HOW THE BRAIN FUNCTIONS WITH NEW EMERGING TECHNOLOGIES AND FINDING A WAY TO COMMUNICATE THAT TO MY STUDENTS IS NOT JUST A JOB, BUT A PASSION FOR ME.

SPOTLIGHT  
MY JOURNEY AS A TEACHER AND A SCIENTIST BEGAN DURING MY UNDERGRADUATE YEARS, WHEN I TOOK A COURSE IN IMPROV COMEDY. IMPROV TAUGHT ME TO THINK SPONTANEOUSLY. THERE IS NO SET SCRIPT OR DIALOGUE, BUT CHARACTERS ARE CREATED COLLABORATIVELY IN REAL TIME. MY IMPROV TRAINING ALSO MOTIVATES MY RESEARCH—THE IMPORTANCE OF UNDERSTANDING BEHAVIOR AND MOTIVATION THROUGH THE STUDY OF CHEMISTRY OF THE NERVOUS SYSTEM. IT’S NOT AT ALL SURPRISING THAT I SHOULD FIND A HAPPY HOME HERE AT WPI, WHERE WE FOCUS ON THE TECHNICAL THROUGH EDUCATING AND MOTIVATING THE WHOLE STUDENT.

DIPLOMAS  
ALL OF THE ACCOMPLISHMENTS IN MY SCIENTIFIC CAREER—FROM MY PHD THESIS TO THE AWARD OF TENURE FROM WPI—CAN BE FOUND ON THIS WALL. EVERY TIME I OPEN THE OFFICE DOOR, IT REMINDS ME OF WHAT I HAVE ACHIEVED, BUT ALSO MAKES ME ASK, “WHAT MORE CAN I DO?”

WPI JOURNAL  wpi.edu/news/wpijournal  |  winter 2018
BULLETIN BOARD
HERE HANGS OUR PUBLISHED RESEARCH FROM THE PAST FEW YEARS. SEEING THE NAMES OF MY GRADUATE STUDENTS ON THESE PEER-REVIEWED PUBLICATIONS IS A CONSTANT REMINDER THAT GREAT SCIENCE IS ONLY ACCOMPLISHED IN TEAMS.

LETTER FROM YOUNGSTER
MOLLY WAS MY FIRST PEN PAL AT WPI—SHE WAS 5 YEARS OLD WHEN SHE WROTE THIS LETTER. OUR LAB’S RESEARCH IS INVOLVED IN PUBLIC OUTREACH VIA TOUCHTOMORROW, AND ONE OF THE PROJECTS INVOLVED UNDERSTANDING YOUR BACKYARD’S SOIL COMPOSITION AND ECOLOGY. MOLLY AND HER PARENTS WERE THE FIRST PEOPLE TO SEND US THEIR SOIL SAMPLE WITH MOLLY’S SWEET NOTES ON HER EXPERIENCE AS A SOIL SCIENTIST. THIS LETTER IS A CONSTANT REMINDER THAT THERE IS NOT AN AGE LIMIT TO SCIENCE.

“DA WORM” 
CAENORHABDITIS ELEGANS IS A NON-PARASITIC ROUNDWORM WITH WHICH WE CONDUCT RESEARCH IN OUR LABORATORY. AS NEUROSCIENTISTS, WE ARE INTERESTED IN UNDERSTANDING THE MECHANISMS THAT UNDERLY HOW NEURONS (CELLS OF THE NERVOUS SYSTEM) WORK IN NETWORKS TO COORDINATE BEHAVIORS. OUR WORK ON WORMS INVOLVES UNDERSTANDING THE ROLE OF SMELL IN NEURODEGENERATIVE DISEASES SUCH AS ALZHEIMER’S.

CHINESE FISH
ONE OF THE GIFTS MY MQP STUDENT (HUAMING SUN) GAVE ME WHEN WE SUBMITTED HIS QUALIFYING THESIS IN COMPUTATIONAL BIOLOGY. THE SYMBOLISM OF THIS DECORATIVE FISH IS ABUNDANCE, SUCCESS, AND WEALTH.

CUP
THIS COFFEE CUP WAS ONE OF MY FIRST POSSESSIONS WHEN I STARTED AT WPI IN AUGUST 2012. EVERY MORNING AS I FILL THE CUP WITH HOT COFFEE, IT REMINDS ME OF MY ROLE AS A SCIENTIST AND TEACHER. DRINKING COFFEE WITH THIS CUP IS INSPIRATIONAL!

INDIAN DEITIES
THESE TWO INDIAN DEITIES, LORD GANESHA AND MAHALAKSHMI, CAN BE FOUND IN EVERY WORKPLACE AND HOUSE IN INDIA. I KEEP THEM IN MY OFFICE BECAUSE THEY CONTINUOUSLY REMIND ME OF MY CULTURE AND ALSO THAT YOU CAN TAKE ME AWAY FROM MY HOMELAND, BUT YOU CANNOT TAKE MY HOMELAND AWAY FROM ME.
THE 35-YEAR CAREER OF PHIL RUBIN ‘79 (ME) touched many aspects of process and manufacturing industries as he rose to corporate VP roles. His profession spanned the globe, carrying him to Asia for 10 years and Europe for five, with international assignments in 38 countries. So what did this supply chain leader do upon retiring at 62? He relaxed into community service— as mayor of Hideout, Utah.

Phil and his wife, Lynn, moved to the state full-time after years of splitting their vacations between two seasonal homes (Delaware and Utah), waving goodbye to the lengthy daily commute to their homes in Atlanta.

"Lynn and I ran our numbers and thought that we could probably retire fairly soon," he recalls, "but if so, what did we want from life? We decided it was time to pull the plug on traffic and move to a healthier life style." The couple’s retirement to-do list was short and simple: live a healthy and balanced life; eat right; work out; get outdoors; stay intellectually stimulated; work toward a greater good.

Phil says that the majority of their list items were checked off simply by being in Utah full-time. But one item remained: giving back. Soon Lynn was volunteering at the local women’s shelter and working on a community farm; Phil found himself attending Town Council meetings.

"I was listening to the community complain about various issues and hearing residents say things like ‘someone should do something,’” he says. "I realized I could say the same thing—or I could do something." After much discussion with Lynn, Phil decided to run for public office. "In June 2017," he says, "I filled out the forms to run, and in November—much to our surprise—I was elected mayor ... with 62 percent of the vote!"

In this beautiful town (of just under 900 residents) nestled in the northwestern corner of Wasatch County in the northern part of the state, Phil shares that the prior administration of this young town (incorporated in 2008) was composed of people who had full-time jobs elsewhere and limited time for community issues.

"It’s been very rewarding to leverage my educational and professional background to drive improvements in the community," he says. His office has been busy maintaining water and sewer systems, and making safety improvements throughout the community. "We now have a modern website, and the municipal employees all have PCs and mobile phones, as well as a network infrastructure that enables file sharing and improves document control."

He says that his engineering background has helped ensure that the town’s fledgling infrastructure is being managed and maintained properly. "I am responsible for its civil, electrical, mechanical, financial, and IT infrastructure,” he says, “all facets I was exposed to as part of my WPI education.”

Phil’s turning point has been about engineering a future for his community; he admits that transitioning to a mayoral role has been “both fascinating and challenging.” As he speaks warmly of his new adopted home and all that it has to offer—especially its “perfect weather and unbeatable views from our deck”—one can’t help but imagine that this is a wonderful way to retire.

—Doreen Manning
Susan Mockus ’99

By Joan Killough-Miller
Photography Kathleen Doher
decoding the language of cancer
Imagine that you’ve just heard a terrible sentence:

You have lung cancer.

Four terrible words, but you haven’t heard anything yet.

“Lung” is merely where the cancer lives—like a country, or even a whole continent. “Cancer” is not a single disease—it’s a blanket word for myriad ways that cells can go wrong. One small defect in a single gene sequence is enough to make cells multiply out of control. It’s important to know which one is affecting you.

A sampling of cells is sent off to a pathology lab, and more precise words come back. Adenocarcinoma, non-small cell lung cancer... it’s all a blur to you. Through gene sequencing, your mutation is narrowed down to a specific site. Now you have a label for your cancer: EGFR T790M. Even if your doctor translates some of that [EGFR stands for “epithelial growth factor receptor”], it’s still just a jumble of letters and numbers to you. To an oncologist, it’s like GPS coordinates—a precise location that can be targeted by a “personalized” therapy—if only your doctor can sort through the massive heaps of scientific research published every day and zero in on the information that could help you.

FIFTY WAYS TO NAME YOUR CANCER

Sitting in a sleek office along the steel-and-glass spiral of The Jackson Laboratory (JAX), in Farmington, Conn., Sue Mockus opens her laptop and demonstrates how hard it can be to pinpoint the right information. She types in your mutation—EGFR T790M—and instantly gets 1,419 hits on the PubMed database. Google Scholar returns more than 20,000 article titles. “Your doctor doesn’t have time to read through all that,” she states flatly, in her no-nonsense manner.

Mockus then runs the same search on the research organization’s genomic database—the JAX Clinical Knowledgebase. It’s her baby, so she gets to call it by its pet name—CKB. This time, the screen displays an orderly grid that racks up the relevant results by category. There’s detail on the known cancer gene variants, and links to relevant treatment options. By clicking on the “Efficacy Evidence” tab, your doctor can find out which drugs are FDA approved, which are in clinical trials, and which trials might be open to patients like you.

“I call it a digital and dynamic encyclopedia of cancer mutations,” Mockus says. She’s quick to point out that the software doesn’t make treatment decisions—it’s a tool that helps doctors and researchers zero in on the relevant findings. Unlike other databases that are crowd-sourced, CKB is professionally “curated” in-house by the team of PhDs she leads, all of whom have the expertise and the hands-on lab experience to know a sound experiment when they see one. CKB also channels the nomenclature used by different researchers and publications through a standardized filter. “There’s 50 ways to say the same thing,” Mockus points out.

“Part of the job of building CKB was to harmonize the vocabulary so they all speak the same language.”

CKB was born out of an in-house need at JAX, to address what Mockus dubs a “bottleneck” at the end of the bioinformatics pipeline. “We initially built this to support our own tumor testing lab,” she says. “People think the biggest challenge is in the wet lab technology [where tissue samples are analyzed]. But actually it’s not. The biggest bottleneck is interpreting all this information and communicating it back to physicians, so they can use it to help patients.”

Mockus didn’t have much of a blueprint when she first came to JAX. Her role—and the helix-shaped building—were still under construction. “I don’t even remember the job I actually applied for,” she laughs. “Nor did they know exactly what I was going to do when they hired me.”

After helping establish the wet lab, where DNA sequencing is done, and seeing no commercial product robust enough to organize the resulting data, she stepped up to the challenge of building the database from scratch. It launched publicly in 2016, and continues to evolve.

(See sidebar.)

“I was given almost complete autonomy to take this from concept all the way through to business development,” Mockus says. “Science has always been my passion, ever since I started at WPI. But my job now is like being an entrepreneur within a nonprofit enterprise. My business skills and an MBA [from Yale] enable me to do that part better.” She relishes the mix—from interacting with primary investigators on medical research, to managing product development and promotion, to working with the revenue-generating arm of JAX, which channels all surplus back into the lab’s nonprofit mission of sustaining innovative research. Her satisfaction comes equally from growing the enterprise and from staying close to “the hottest science that’s going on.”

BARK FOR THE CURE

Recently, Mockus’s dream job went to the dogs—in a good way. Last year, an anonymous donation enabled JAX to expand its work with Tallwood Canine Cancer Research Initiative. With deadpan humor, Mockus reenacts the moment when her boss, Charles Lee, approached her with a formal request to utilize the CKB in the canine research project.

“Charles,” she replied, with exaggerated firmness, “Not only can you use it, but I love dogs, and I want to be part of this project.” As she puts it, “I basically inserted myself and took over the project.” Her outreach includes “onboarding” more veterinary practices to supply samples from “volunteers”—that is, dogs whose owners choose to provide cells from the naturally occurring tumors that were removed from pets. (No dogs receive care at JAX—the project’s goal is to closely study their gene mutations, with the hope that this knowledge will accelerate advances for both species.)

Canine cancers share many similarities with human cancers, Mockus points out, and some cancers that are rare in humans are more common in dogs, which yields a larger sample pool. For example, osteosarcomas tend to affect large dogs, like Patrick, the shaggy Irish wolfhound that belongs to the Tallwood project’s initial donor. Patrick—who is not plagued by cancer—makes an endearing poster dog for the project. He partners (and poses) with Mockus at fundraising events like the American Cancer Society’s Bark For Life, an outdoor day of fun and learning for dog lovers and their pets. “We’ve done so much on the human side,” she says, “getting away from these dirty chemo drugs that are highly toxic, to more targeted therapies and immunotherapies. I haven’t seen that for our canine companions.”

THE ART OF THE CODE

Mockus knows the pain of canine cancer well. Her first dog, back in her postdoctoral days at the University of Washington, was Georgia, a fox terrier who was prone to mast cell tumors. There were numerous
Founded in 1929, the Jackson Laboratory (jax.org) is an independent, nonprofit biomedical research institution. Its mission is to discover precise genomic solutions for disease and to empower the global biomedical community through curation of data and provision of critical research models and services—including 10,000 strains of genetically defined mice.

The JAX Clinical Knowledgebase (CKB) has more than 35,000 users in 121 countries. Initially developed for in-house use, it is now publicly available in three versions:

- **CKB Core™** provides free access to 86 of the most highly actionable genes
- **CKB Flex™** provides scalable and flexible content integration for 1,000+ genes
- **CKB Boost™** provides web-based access to 1,000+ genes
Susan Mochus with rescue dog Sophie
biopsies, always an ordeal for both pet and owner. She dreamed of developing a simple diagnostic blood test. When the Tallwood Canine project came along, it was a dream opportunity to be part of research that could benefit the people and the dogs in her life.

Georgia was named for Georgia O’Keeffe. Mockus’s current rescue dogs are all named for artists: [Andrew] Wyeth, [Ansel] Adams, and Sophie [Pemberton]. What moves a biotechnology major/MBA with a PhD in pharmacology and neuroscience to name her dogs for those masters?

“I’ve always loved art,” Mockus replies. Her art history and architecture classes at WPI are some of her favorite memories, and field trips to the Worcester Art Museum have led her to seek out museums wherever she travels. Her Humanities Sufficiency analyzed the work of Salvador Dali and the surrealist school. A quarter-century later, Professor Dave Samson recalls reading and dissecting the founding manifestos of the surrealist movement with her, and discussing Freudian theory in relationship to Dali’s work. He comments, “A student that smart who put so much natural energy into her classwork—even as a non-major—makes a [then] new-ish faculty member happy to be teaching here. For quite a while I used to bring Sue’s Sufficiency paper to HUA open houses and new student orientations as an example of the excellent things WPI students do.”

“That’s what I loved about WPI,” Mockus reflects. “I could major in science and still have a concentration in a subject I loved. People think of science as very structured, but there’s a whole avenue of creativity. I think finding different outlets to explore that creativity makes you better at what you do, no matter what your field.”

Not many schools had a biotechnology program in the early 1990s, and that’s what drew her to WPI. Work within her major served as stepping stones for her career. She interned at Collaborative Research in Waltham, Mass., known for pioneering work on the human genome. Her MQP there created a database for forensic testing, based on DNA analysis. “Susan took my Cell Biology and Advanced Cell Biology classes,” says Professor Dave Adams, “where we explore DNA fingerprinting techniques, among other topics.” Research articles form the basis of this class, and it was here, and in a student club that Mockus learned to decipher scientific papers.

“They were extremely intimidating at first,” she says, but with experience it got easier. Later, when she undertook her MBA at Yale, she was initially thrown by the jargon of her classes in economics and accounting. “But it’s just a different language,” she says now. “The underlying principles and the ways of thinking are the same. Just the language and the acronyms are different; once you get over that, it’s easy.”

Asked what draws her to genetics, she again refers to the challenges of deciphering a cryptic language.

“There’s an instruction manual there,” she elaborates, “but we don’t yet have all the tools we need to read it. If you gave me a manual in Chinese, I might be able to pick up on some of it through exposure and reading. But there’s still a code I need to unravel. Once I do, I can start to see how things work, and how they integrate. When things break, if we have the instruction manual, we can fix it. That’s what appeals to me—the fun of discovery, and the knowledge that can enable us to fix what’s broken.”
ALDEN SOCIETY
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in a life income gift?
as a beneficiary of life insurance,
IRA, or other retirement account?

Membership is about giving you
recognition NOW for your plans to
support WPI in the FUTURE. To join
visit plannedgiving.wpi.edu.

“I feel incredibly blessed
to memorialize Bernard
Brenner’s life and work in
partnership with WPI.”

Rebecca’s gift of the sculptures,
a bequest through her estate
and the establishment
of two endowments in her
father’s name are incredibly
thoughtful and generous ways
to honor his legacy. “My father
would have loved WPI.”

FOR MORE INFORMATION
Contact Lynne Feraco
Executive Director of Gift Planning
888-974-4438
lferaco@wpi.edu

Rebecca Brenner,
friend of WPI
From the bustling makerspace to the high-tech classrooms to the Messenger Residence Hall, WPI’s distinctive project-based approach comes to life in the Foisie Innovation Studio, opened September 2018.

Like Alumni Gym that stood in this place, it’s the generosity and vision of alumni donors—and other friends of WPI—that made this building, and the opportunities it holds, possible.

We opened the doors, so our students can open their imaginations.

openspaces.
openminds.
openpossibilities.
Foisie Innovation Studio

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openspaces.
openminds.
openpossibilities.
Increased self confidence. Credibility among peers. Self discipline. Improved communication. Global thinking. Curiosity. For many, these are the tangibles of an MBA degree.

Just ask Kathryn Cooney, on track for an MBA from WPI's Foisie Business School in 2019. The Framingham resident and 9-year veteran of Hanover Insurance Company graduated with a strategic management concentration from Babson College in 2009.

“I loved my time and experience at Babson, but when the time came to look at programs, I wanted to try a different school for a distinctive perspective,” says Cooney. “For me, WPI was that school.”

Cooney felt that securing her MBA could aid her as a member of Hanover’s Program Management Office, working mainly on the build-out of technology strategy in support of its overall organizational strategy.

Initially seeing this degree as an accessible opportunity that encouraged a work-life balance, Cooney admits that at first a blended (a combination of online and traditional classroom) course load felt intimidating. “I thought that online learning was going to be more difficult for me,” she says. “I learn by engaging, discussing, and applying. The online courses of yesterday (in my mind) were ‘read the text, take a test, and move on to the next subject.’ This program offers a model that is so much more than that.”

From online discussion boards that keep her accountable, to the group project framework, Cooney explains that her classmates “get into a rhythm. We know our team’s inherent strengths and weaknesses and are able to push ourselves and each other.”

When asked about a favorite course to date, she easily shares that Financial Intelligence for Strategic Decision Making made the top of her list. “I really enjoyed the way Professor Fabienne Miller structured the course with the intersection of strategy, finance, and ethics—and the guest speakers brought the topics to life,” says Cooney. She says the course was timely, as she was beginning a new step into strategy work at Hanover at the time, “so having the structured support and development from learning in the class was supplementing what I was learning on the job.”

With WPI’s strong project-based curriculum, it should be no surprise that Cooney says teamwork has been a key element of her grad work. “I learned a new dimension to working on teams and how they function through this program. You are there to further your team, and your team is there to further you.”

The biggest takeaway from the MBA program has been in the depth of connections and relationships Cooney has developed. “Part of my pursuit of a blended program versus a program that is strictly online was for the opportunity to network in person,” she explains. “I have developed really strong friendships with my classmates – I talk with them daily and our conversations have expanded to further than just the school work we have going on that day. I’ve gone to them for work advice, coaching, mentoring, and comic relief! Their friendships bring a lot of diversity in background, thinking, and experience to my perspective.”
Joshua Resnick ’01

RESNICK OUTSIDE TESLA’S DUMBARTON FACILITY IN CALIFORNIA
Helping build a revolutionary big rig
Some 34 million semi trucks—also known as tractor-trailers or 18-wheelers—are currently in operation across the United States, hauling more than 10 billion tons of goods every year. In 2016 commercial trucks used 38.8 billion gallons of diesel fuel, at a cost of nearly $90 billion. And while trucking is a vital element in the national and world economy, according to the Environmental Protection Agency, medium- and heavy-duty trucks are also responsible for spewing 470 million tons of carbon dioxide into the atmosphere every year—a number that has nearly doubled over the last two decades.

But the era of noisy, polluting diesel trucks may soon be coming to an end, thanks to a team of engineers at Tesla who are working on a revolutionary new kind of big rig. The Tesla Semi will be able to travel as far as 5 miles on a single charge, consuming less than 1 kilowatt-hour per mile. That’s good news for the environment and a boon for trucking companies, which can expect to save as much as $100,000 per vehicle, per year, that they’d otherwise have spent on fuel. The Tesla Semi is also billed as the safest truck ever, with an “Enhanced Autopilot” system that helps avoid collisions. And instead of a roaring engine, it makes a quiet, spaceship-like sound as it revs from 0 to 60 miles per hour—fully loaded—in 20 seconds or less.

“This will have a huge impact on the economics of trucking,” says Joshua Resnick, a senior engineer on Tesla’s semi team who has worked on the truck since the program’s inception in 2015 and designed the system architecture for its electronic controls. “There’s a ton of interest and a ton of people who have pre-ordered the vehicle.”

Building the world’s first all-electric semi truck is a challenge that makes sense for the electrical engineering alum, whose friends call him “the mad scientist.” In a career that has taken him from a basement lab in WPI’s Atwater Kent Laboratories, to a remote Alaskan fishing community, to the foothills outside America’s high-tech capital (Palo Alto), Resnick has spent his life tinkering with everything from fusion reactors to fishing boats. But building things is not his only passion. With a master’s in theology and experience working with at-risk youth, he is also driven by a mission to do good. And that, he says, is what makes Tesla the perfect fit.

“We’re a very ideological company,” he explains. “We’re focused on transitioning the world to sustainable transportation, and it’s exciting to work at a company that’s on the leading edge. Because for me, what matters at the end of the day is, am I doing something that matters?”

**CREATIVE FREEDOM**

When Resnick arrived at WPI in the fall of 1997, he was already an amateur engineer—he had spent his high school years avidly building and flying radio-controlled airplanes and helicopters, experimenting with the possibilities of flight. Once on campus, he immediately sought out the machine shop.

“It was great, because I could just walk into the shop and make whatever I wanted,” he recalls. “I liked having that freedom and having all those good tools to work with. Even
while I was taking my core classes, I had the opportunity to be creative on my own, and that’s really where I thrive the most. I was just making stuff!”

Some of the stuff Resnick wound up making was far from ordinary.

“The Tesla coil got me in trouble with Campus Security,” he confesses. “My roommate and I were outside the dorm turning it on and making these giant electrical discharges—like, literally, I’m talking continuous eight-foot sparks. It’s a pretty scary contraption and it makes a lot of noise—it sounds like a machine gun.”

Noticing the spectacle, a security officer stepped out of his car. While he couldn’t determine if the freshmen were technically breaking a rule, he told them the sparks needed to stop flying.

“I wonder if they added ‘no building Tesla coils’ to the campus rule book later,” he muses.

Other extracurricular projects received a better reception, like a tabletop nuclear fusion reactor, which earned him a mention in American Scientist magazine when he was a sophomore. Soon, faculty began to seek out Resnick’s help on their own research projects. Professor Alexander Emanuel offered him a disused lab space in the basement, complete with voltage generators and other power equipment. Professor David Cyganski asked for his assistance on a series of physics experiments, and their collaboration eventually led to an MQP that Cyganski still marvels over.

“The things he wanted to tackle were outside the realm of what many students might be interested in,” he says.

Resnick’s project investigated a phenomenon observed in prior radioactivity studies that seemed to violate the laws of physics. Believing the anomaly might be caused by environmental irregularities, he began with a commercial refrigerator, which he converted into an apparatus that controlled temperature to within 1/1,000 of a degree. After experimenting with temperature, air pressure, humidity, and other factors, Resnick and Cyganski were stunned to learn that the anomaly was caused by an error with a very commonly used sensor.

“No one would have seen it coming,” Cyganski says. “His project was an absolute tour de force.”

**LOOKING FOR ANSWERS**

After graduation, Resnick surprised his WPI professors when he went on to earn a master’s degree in theology from Hellenic College Holy Cross, in Brookline, Mass.

“I was very interested in the intersection between faith and science,” Resnick explains. “I feel that it is important to maintain a perspective of awe and mystery in the face of nature and the universe, and not think we have all the answers. Ultimately, realizing we don’t have all the answers is what drives scientists and theologians alike to seek for deeper understanding. The problem is when either discipline takes its own answers too seriously—or stops looking deeper.”

That perspective would influence the next phase of Resnick’s life, an adventure that took him to Kodiak Island, off the southern coast of Alaska. With a population of about 13,000 and an economy that revolves around fishing, Kodiak also has its share of social problems, including drug abuse and alcoholism. Resnick worked with at-risk youth, mentoring high school students and running a science camp. But he soon realized he was still an engineer at heart, and he found his way to working on the island’s fleet of fishing boats. Eventually, he started his own company, installing power systems designed to survive challenging conditions at sea.

“If you’ve ever seen the TV series Deadliest Catch,” he says, “I literally worked on many of those boats. They typically have anywhere between 250 kilowatts to half a megawatt of installed electrical power—those are some pretty big generators, and those systems require a lot of engineering and maintenance.”

The business alerted Resnick to opportunities for innovation—the boats were running the same type of equipment, including polluting diesel generators, that they’d been using for decades.

“A lot of these boats could be all-electric,” he says. “And so I think there’s a lot of opportunity in that space—a lot that could happen to improve their energy efficiency and sustainability.”

A $500,000 grant from Alaska’s Emerging Energy Technology Fund allowed Resnick to assemble a small team of researchers to explore the possibilities. They wound up developing new technology for battery-powered electric propulsion and enhanced efficiency of diesel generators, providing the state with a blueprint for modernizing the fleet. But while the technology was solid, Resnick and his family (he and his wife, Lucia, now have five children) were in need of a change of scenery. Long a fan of Tesla’s work toward sustainable transportation, he sought out a recruiter and wound up finding a perfect opportunity.

**TEAM DYNAMICS**

In 2015 Resnick moved from Kodiak to California, settling south of Silicon Valley in a redwood forest outside Santa Cruz. Once a small business owner in a remote fishing community, now he’d be working at a top emerging technology company—one with a charismatic, if sometimes controversial, founder, Elon Musk, who had the eyes of the world trained on what he would do next. It was a bit of an adjustment.

“Tesla is very team-oriented, and I found this to be a growth point for myself,” Resnick says, explaining that there is a small team of engineers working intently on the semi truck. But like most Tesla projects it’s the product of a company-wide effort. “Learning how to work on these larger teams has been a new experience for me,” he says. “People are always leaning on each other’s expertise.”

Resnick’s own expertise is in the truck’s system architecture, which connects the controllers for the various sub-modules that make up its electronics—everything from the drive inverters that power the motors, to the door latches and headlights. He also led the team that designed the wiring harness, which he describes as the truck’s “nervous system.”

At present, the team is designing its production vehicle—one that will be sold to the first round of customers. Pre-orders have already been made by companies like J.B. Hunt, one of the largest logistics companies in the U.S., along with UPS, Pepsi, Walmart, and Anheuser-Busch. Two semis are already on the road, hauling equipment for Tesla’s own use, and excited Tesla fans have made a hobby of reporting sightings on the Internet, posting photos and videos of the trucks in states as far-flung as Colorado, Oklahoma, Arkansas, and Illinois.

It’s easy to see why, unlike the currently ubiquitous diesel-powered tractor-trailer, Tesla’s Semi has inspired such buzz. Beyond the revolutionary potential for reducing greenhouse gas emissions, it also boasts sleek, aerodynamic lines, much like the company’s passenger cars—in fact, the Semi, Resnick says, is essentially an extra-large version of the vehicles Tesla is already known for.

“If you compare the feel of our truck to a regular diesel truck, it’s a totally different experience,” he enthuses. “The acceleration is very smooth, and it accelerates many times faster—even with a payload—than a regular truck. Braking is smoother, and the driver sits in the center, which gives you a much better view of the road. All of the systems are fully integrated, and it’s just a much cleaner experience.”

As Resnick lists the features of the Semi, it’s clear that he is still, at heart, the mad scientist driven by a love and a talent for building things. In fact, he is beginning to sound a little like that WPI freshman who built his own Tesla coil just for the joy of watching sparks fly. J
Finn Arnold ’83

finding resonance
after 35 years with Bose

BY KATE SILVER | PHOTOGRAPHY MATT FURMAN
Arnold with his Kitfox Series 7 on the runway of Worcester Airport
Arnold was always drawn to music, having been raised in a family where it was not a question of whether you played an instrument but which instrument you played. While—by his own admission—not as talented as his siblings, he focused his energies on recreating vs. creating music. As a student majoring in electrical engineering and minoring in music, this resulted in learning how to program a computer to synthesize the sound of musical instruments. Later, during his career with Bose, it meant working with teams of engineers to build products that would deliver superior sound through technology.

Arnold learned during his 35-year career that his greatest satisfaction came from being a conductor and an instructor, leading teams whose talents and energies together could create something bigger and better than anything they could do on their own. As a manager, a mentor, and—at the heart of it—an engineer, he was driven to lead in a manner he calls “on resonance.” Now that he’s retired, he’s searching for that next wave: sound, or otherwise.

**FINDING HIS PASSION**

It began with a chip. As a teen growing up in the small town of Harvard, Mass., Arnold heard that Radio Shack was selling a kind of synthesizer on a chip. This, he thought, would be his chance to play with sound. A synthesizer would be cool and it inspired dreams of a new endeavor. He bought the little wafer-thin device, with prongs that were meant to plug into a circuit board, and realized when he got it home that he had no clue what to do with it. So he began researching. He learned about resistors, capacitors, and proto boards—also learning how to interface them to a TRS-80 computer.

“If you did it right, you could make something that, when hooked up to a speaker, would make a wide variety of sounds,” he recalls. “You could make different pitches. You could make things that sounded like sirens or explosions.”

It gave him his first taste of engineering. At the same time, he says, it distracted him from high school. “That was how I would spend my time, and what I was motivated by. Doing my homework and grades and things along those lines never really rose to much importance.”

But just a couple of years later, college would consume his focus in the same way the synthesizer did. WPI gave him the opportunity to flourish. His older brother was a student at the school, so Arnold knew all about the science focus, and loved the idea of solving engineering problems, from both a technical and a theoretical perspective. Plus, he says, WPI had a way of teasing out the best in students.

“I had struggled in high school because in high school there’s a lot of telling you what you have to learn,” he says. “And I found at WPI it was much more ‘what can we help you learn?’”

His love of music grew, as he learned about the mathematical formulas behind it. His Humanities Sufficiency project allowed him another chance to explore the synthesizer.

He was intrigued by the concept of trying to create something from nothing. He wondered: Can you understand sound to the point where you can rebuild it? For his project, he transposed an entire piece of music, mathematically describing each instrument and note in order for the computer to actually create the music.

“You quickly realize how incredibly complex it is,” he says, “to try to make something that sounds anything like a real-world instrument.”

He says he learned a great deal from one electrical engineering professor in particular: Dan Wolaver, who pushed him to be a better engineer. Wolaver was experienced in the industry, which allowed him to help students understand the difference between theoretical engineering and how a project might actually manifest in the real world. “He helped you tease out your own thinking,” says Arnold.

In his senior year, Bose came to campus to recruit. For Arnold, the notion of working for the audio
Arnold built his Kitfox Series 7 with his three sons over a 2 1/2-year span (his vision: flight 2010). He admits, “It’s been flying,” and the adventure and the opportunity to share the unique perspective with a passenger that keeps him flying.
electronics company, known for investing deeply in its projects and its employees, was a dream that would allow him to combine the two things he was most passionate about: music and engineering. The on-campus meeting led to multiple visits to Bose, for a tour and subsequent interviews. While there, he saw two cutting-edge technologies for 1983—a noise-canceling headset prototype, and a Sony CD player—and was in awe of both. Once hired, he got to work on, even came to oversee, projects just as cutting-edge in their own right.

FROM ENGINEERING PRODUCTS TO PROJECTS

In his early days as an engineer with Bose, Arnold was in the automotive division, bringing high-quality music to cars. At the time, the company would partner with car manufacturers, working closely to design a stellar audio system. Today good sound systems are often expected, but back then, Arnold recalls, the Bose engineers were pioneers.

“At that time the first thing anybody who was serious about audio would do is tear out the system in the car and then go to the aftermarket and assemble something of their own,” he says. “But if you could really design the audio system, if you could measure all the acoustics of your car, understand the different locations for the speakers in the car and really design it integrally, you could do a tremendously better job in how that gets done.”

For a 20-something recent college grad, it was about the best experience he could hope for. “You’re working on vehicles that haven’t been released yet, driving around in a pre-released Corvette to make sure it sounded good on a sunny day with the top down,” he recalls. “Life wasn’t so harsh.”

In the late ’80s he worked on a noise-cancelling headset that was aimed at private pilots. He’d recently earned his own pilot’s license, and recalls telling other aviators that the headphones could make them fly faster. “When flying long distances, I would limit how fast I would fly the plane, because it got pretty noisy,” he says. “Of course, with noise-cancelling headsets, I could fly whatever the limit of the plane was” To him, that truly meant flying faster.

As his experience grew, so did his responsibility, and Arnold was soon leading departments: as chief engineer responsible for product development in the automotive division; as head of acoustics research; as director of product development for the home entertainment division (filing for about 20 patents along the way). In time, he became vice president of research and emerging business, overseeing a team of more than 150 engineers, scientists, and creative entrepreneurs.

With the shifting roles came shifting passion. Early on, he loved engineering for the euphoria he felt when he successfully built a circuit or wrote a program or connected a synthesizer. As a manager, something else drove him: the magic feeling that arose when he connected the right people with the right project. He refers to it in scientific terms: managing on-resonance. “On-resonance is really finding someone’s natural drive, natural passion, and bringing that to the forefront,” he says. “When it works, it’s tremendous.”

It reminded him of a time growing up when his sister was taking horseback riding lessons, and was about to learn jumping. He overheard her asking her instructor, “How do you make a horse jump?” Her teacher looked at her and said, “You don’t teach a horse to jump. You let it.”

It’s a poetic way of summing up “on-resonance,” and it’s a lyrical way of looking at his own life. In hindsight, Arnold believes that he found his own resonance at WPI, when he was given the opportunity to stoke his mind and grow. He brought that philosophy to Bose with his management style. “How do you get people to do a good job? You don’t,” he says. “You let people do a good job. You help them do a good job. They’re going to do that naturally.”
Santiago Carvajal ’89 saw the university’s influence firsthand. The fellow alumnus worked under Arnold in the research department at Bose. “One of the great things about WPI is how it’s not just theoretical, it’s very practical in how it teaches. And it does a really good job of connecting students to real jobs and real problems of industry, and then applying an engineering mindset or problem-solving approach to those,” he says. “Arnold exuded that. There’s no doubt in my mind that’s the case.”

Carvajal thinks back to a project he worked on with Arnold, called 9ideoWave. The goal was to create a simplified in-home theatre with a flat-screen television that gave off incredible sound. The resulting product was so expensive it was never a commercial success. But from a quality and satisfaction viewpoint, he recalls, it was a winner. “The product knocked everybody’s socks off, including ours! Every time they would develop it further, they would improve it in ways we’d never imagine possible. We were all blown away by what the engineering team was able to do,” he says.

He attributes that success to Arnold’s leadership. “He had this knack for knowing how to influence people,” he says, “and knowing who the right people to influence would be to actually get something big and new and different done.”

Arnold says the project was one of his proudest moments in management. The evolution of the project reminds him of the fable “Stone Soup,” when the townspeople each brought something of value to the pot. When there was a challenge for one engineer (the array didn’t handle high frequency sound well), another engineer stepped up with technology (phase guides) that could solve the problem. “It got better and better and better as it went through the system with people excited to be part of it,” he says. It was, in other words, on-resonance.

THE KNACK

In her 15 years with Bose, Kathy Krisch, a director in the Bose Consumer Wellness division responsible for the hearing assistance business, also noticed Arnold’s knack for working with people. “He would be able to put the right people and the right technologies and the right goals in place and then kind of let ‘er rip,” says Krisch. In fact, her division, which creates devices that help people hear better, is a new direction into the wellness space for Bose, and it’s something that Arnold helped move forward. He believed in the product, advocated for it, and made it a priority at the company.

“He always shows that instinct,” says Krisch. “He bets on ideas and he bets on people.”

But he also leaves a lasting mark. Arnold acted as a mentor to Krisch, Carvajal, and countless others, encouraging them to bring the best out in people, just as he endeavored to do. “He put people first. He really believed in people, in helping them grow, helping them reach their fullest potential, coaching them,” she says. “He was a huge advocate up and down the organization in developing people, and the thought that from this, good things would come.”

FOLLOWING THE MUSIC

Arnold retired last March after more than three decades at Bose. In the months since, he’s been tinkering. He’s fixing up the house that he and his wife, Jody (they met at Bose), designed and built. He’s working on the plane he assembled. He’s planning a trip to visit one of their three sons. And while he’s enjoying the time, he says he’s also starting to feel the itch of “What’s next?”

“I’ve been thinking ... where does one contribute in the future?” he muses. He’s been asking around about opportunities that would allow him to coach companies or even students. In those conversations, he shares who he is and what he’s passionate about, and then inquires, “Is there anything I can help you do?”

At WPI and at Bose, that approach has worked out beautifully. He’s betting it will continue to do so, as he seeks to find his new resonance.

Residing on 42 acres of beautiful New England land, Arnold hasn’t slowed down much, but occasionally pauses to enjoy the view.
FROM THE DESK OF
David Wheeler ’93, ’04 MS
Alumni Association President

TO DO—
✓ Visit TechConnect—the new online portal just for WPI alumni—and sign up. New features will be rolling out this spring, so get TechConnected at wpi.edu/+techconnect.
✓ Make your gift to the WPI Fund: wpi.edu/+give.

CONGRATS—
TO THE WPI COMMUNITY— on another spirit-filled Homecoming on October 27—relive the excitement at wpi.edu/+homecoming.

TO PROFESSOR DIRAN APELIAN—
2018 WPI INNOVATOR OF THE YEAR.

TO THE ALUMNI, STUDENTS, PARENTS, FACULTY, STAFF, AND FRIENDS— who made November 27 WPI’s biggest Giving Day yet—wpi.edu/+givingday.

COMING SOON—
✓ The opening of the Alumni Center at Higgins House, May 30, at the start of Alumni Weekend—watch for details about this celebration of WPI’s first Alumni Center and the donors who made it possible. So many events, activities, and opportunities for involvement this spring—wpi.edu/+techconnect

SAVE THE DATE—
✓ ALUMNI WEEKEND 2019—MAY 30–JUNE 2—details and registration coming soon, so stay tuned to your mail and email, and watch for updates at wpi.edu/+alumniweekend.

ENJOY THE WINTER!

From the Desk Of
David Wheeler ’93, ’04 MS
Alumni Association President

wheelerda@alum.wpi.edu

Save The Date—
Alumni Weekend 2019—May 30–June 2—details and registration coming soon, so stay tuned to your mail and email, and watch for updates at wpi.edu/+alumniweekend.

Enjoy The Winter!

Wheelerda@alum.wpi.edu
HOMECOMING ARRIVED ON THE HILL AT THE END OF OCTOBER WITH A RAGING NOR’EASTER. BUT IT TAKES A LOT MORE THAN RAIN TO KEEP THE GOATS DOWN. THE FESTIVITIES CONTINUED WITH A CELEBRATION OF THE 50TH ANNIVERSARY OF UNDERGRADUATE WOMEN AT WPI IN THE FOISIE INNOVATION STUDIO, A RIBBON CUTTING ON THE NEW ATHLETIC HALL OF FAME, ACTIVITIES FOR KIDS IN THE RUBIN CAMPUS CENTER, ATHLETIC COMPETITIONS, AND MORE.
There are nine academic degrees among four Stratouly siblings, and seven of them are from Worcester Polytechnic Institute. The family had a presence at WPI for 18 years—from 1970 when the eldest enrolled, to 1988 when the youngest received her PhD. But it wasn’t fealty to family or university that brought the brothers and sisters to Worcester. Rather, they followed their own paths and made their education uniquely their own—with the exception of one endeavor where they stood in lockstep: crew.

“If there was one legacy, it was that I had to row—that was an expectation, from the coach and from my family,” says Lauren Stratouly Baker ’82, ’85 (MS ME), ’88 (PhD). Her siblings, Dean Stratouly Jr. ’74 (CE), Paula Stratouly Phillips ’76 (ME), and Brian Stratouly ’77, ’80 (MS ME) were rowers, coxswains, or both. The youngest Stratouly sibling, Adriene, graduated from the University of Massachusetts, Amherst.

Their father (Dean Sr.), a Navy veteran and engineer, was the force behind his children’s education and career choices. The family was living in Westerly, R.I., when Dean Jr. began thinking about studying anthropology at the University of Southern California. His father talked him into what he felt was a more practical choice, and Dean found his way to WPI, where he studied civil engineering.

Paula spent her freshman year at a college in Rhode Island, but she felt she needed a greater challenge. Her father encouraged her to pursue her talent in math and science at a time when women were steered away from those fields. They visited engineering schools, and he supported her when one director of admissions predicted Paula wouldn’t make it as an engineer.

“My father said, ‘You can be anything you want, don’t listen to that guy,’” Paula remembers. That fall, she joined her brother at WPI. The school had opened enrollment to women just five years earlier and Paula was one of 28 women in her class—one of only two in the mechanical engineering major. Dean was a resident advisor in her residence hall.

Dean went on to earn his MBA at Central Michigan University and Paula earned a master’s in finance at Texas A&M. Though friendly rivals in school (Dean still talks about earning a better grade in the English class they shared, while Paula insists Dean and his friends copied off her tests), the two siblings now work together at the company Dean founded, Congress Group Ventures. He is president of the Boston-based commercial real estate investment and development company, and she is chief operating officer.

With his brother and older sister in Worcester, Brian Stratouly wrapped up high school a year early and won a scholarship to WPI. He thrived under the WPI Plan and its self-directed, project-based learning. Having siblings on campus offered perks, he remembers. Brian and Paula shared a car on campus and he took over her job in the mailroom when she graduated. After earning his bachelor’s degree, Brian spent a year doing graduate work in ocean engineering at the University of Florida, then returned to WPI to pursue a master’s in mechanical engineering. He lives in Orange, Calif., where he runs Aero Environmental Services, the environmental and engineering consulting company he founded 22 years ago.

As he did with Paula, Dean Sr. encouraged Lauren to choose a school that would prepare her to be an engineer. Its project-based curriculum drew her to WPI—and having Brian there as a graduate student eased the transition to college, she remembers. Still, Lauren was determined to find her own way. “I was number four out of the whole tribe going to WPI,” she says. “My siblings got master’s degrees, so I thought, ‘I’ve got to one-up them.’ It was a little bit of my own competitive spirit.”

Lauren is president and CEO of Boston Biomedical Associates, a clinical research organization that provides clinical trial and clinical and regulatory consulting services. She founded the firm in 2000. [See WPI Journal, Winter 2017.]

Now more than 30 years after Lauren earned her PhD from WPI, the next generation of family is on campus. Lauren’s son, Jackson, is a first-year mechanical engineering student. He’s a rower, too, but he’s decided to get settled in before joining the crew team.

Jackson’s mom reports, “He told me, ‘I need some distance from you guys!’”
[ DONOR profile ]
IT TOOK NICK TSAPATSARIS
'86 (CE), '87 (MS SE), 15 years, two master's degrees, and a professional license to achieve his career goal of designing and constructing buildings. So when he learned that WPI’s Architectural Engineering program would have gotten him there faster, he was eager to throw his support behind it.

He and his wife, Stacey, have committed $50,000 to endow the Nicholas and Stacey Tsapatsaris Architectural Engineering Fund. The fund will enable the university to better develop innovative programs, more competitively attract motivated students, and successfully seek and retain a world-class architectural engineering faculty.

Nick is also a member of WPI’s Architectural Engineering Advisory Board and the Engineering Dean’s Council.

“The spot where I am in life right now is exactly where this particular program would have taken me in 1986,” he says. “Perhaps that education then would have saved me a decade’s worth of additional education.”

WPI created its architectural engineering program in 2012. It’s the only one of its kind in New England and one of only 20 in the country. Nick says it equips students to become the field’s “decathletes,” proficient in every aspect of building and design.

“The future of what we do is to be a decathlete of the process,” he says, “to be knowledgeable about a variety of different things that happen when you build a building.”

Their own firm, Tsapatsaris & Associates in Ridgewood, N.J., handles all phases of a building’s lifecycle. Nick leads the architecture, engineering, construction, and development, while Stacey fulfills the crucial role of marketing, leasing, and asset management. Last year their firm won a New Jersey Smart Growth Award for its adaptive reuse of the century-old Guenther Mill building in the town of Dover.

Nick’s interest in building and design began in Greece, where he grew up. He came to the United States to attend WPI, which promised a route to his professional goals. “My dream program at the time was at WPI,” he says, “but had there been the architectural degree program, it would have been a super dream.”

He majored in civil engineering, then stayed on to earn a master’s in structural engineering. He received a second master’s, this time in real estate development, from MIT. Roughly 15 years after leaving WPI, he became a licensed architect.

Nick lost touch with his alma mater during the years he spent building his firm, raising three daughters with Stacey, and competing in Iron Man competitions (he may be a decathlete professionally, but he’s a triathlete on the race course). Then, a few years ago, he met President Laurie Leshin at an alumni event in New York City. Her long-term vision for WPI resonated with him, he says. When he learned about the university’s architectural engineering program, he knew he wanted to become involved.

“That’s what reengaged me,” he says. The firm has since hired WPI graduates, who bring more than technical proficiency to the job. “They also understand why they’re doing it in the broader context of society. That’s important.”

Their own office in the 15-year-old theatre he refurbished serves as both an exhibit of his work and a metaphor for his approach. It’s in the former fly loft—the space above the stage where the crew would operate the curtain, scenery, lights, and equipment. The office is sleek and modern, but the Tsapatsarises preserved the iron beams, pulleys, and cables as a reminder of the various and often hidden functions that go into any successful project.

“If I had to show an aspiring student what I do, my office is a pretty good example,” he says. “The architectural engineering program is what would train somebody for something like this.”
DIRAN APELIAN
Alcoa-Howmet Professor of Mechanical Engineering at WPI
Founding Director of the Metal Processing Institute
Director of the Advanced Casting Research Center

Widely recognized for his innovative work in metal processing and for his leadership as a researcher and educator, Diran Apelian has done breakthrough work in the fields of molten metal processing, plasma processing, spray casting, and shape casting of aluminum alloys. His development of technologies to recover and recycle materials is critically important for a sustainable future. His scholarship is valued and used by the industrial sector; he has a talent for bridging industrial and academic communities, and for identifying fundamental scientific issues. He is the recipient of many distinguished national and international honors and awards, and was one of four WPI faculty members recognized with the 2016 Bernard Gordon Prize for Innovation in Engineering Education. He is a member of the National Academy of Engineering, the Armenian National Academy of Sciences, the European Academy of Sciences, and the National Academy of Inventors.
1951
Dick Davis writes, “After a career at Monsanto and a stint in consulting, I returned to school and graduated magna cum laude, obtaining a license as a doctor of chiropractic also licensed in acupuncture. In 2009 I left my practice, and with my wife, Susan, moved to the woods on a farm of 134 acres with dogs, cats, chickens, gardens, a fish pond, and an orchard. I still see 10-15 patients every Tuesday as a mission rather than a business. In November I’ll celebrate my 90th birthday and am so thankful for the health and stamina I’ve been blessed with.”

1954
Owen Allen reports, “Candy and I have just rounded out four years in a cottage at Briarwood Retirement Community in Worcester, near West Boylston. We find it a very suitable and hospitable place to be. Still doing occasional pieces of work for the company I retired from, where they find my experience to be useful. For those who enjoy New England four-season weather we recommend this place.”

1956
Don Lathrop writes, “I thought I’d let classmates know that both my wife, Marion, and I are still alive and kicking. Later this month we will take a trip to Japan to say goodbye, as it were, to our many friends there that we made over 10 previous visits in which we recruited 57 volunteers who came primarily to the U.S. and Canada (plus a few other countries) to make over 11,845 presentations to over 371,219 people, mostly in 38 states and D.C., about the effects of our nuclear weapons on the residents of Hiroshima and Nagasaki. The effort was called “The Never Again Campaign” and drew to a close in 2011.”

1957
Spike Vrushi of Vero Beach, Fla., had a small part in the Vero Beach Theatre Guild production of 12 Angry Men. “My first stint at acting was in high school,” he writes. “Then I appeared in three plays at WPI, and in an off-Broadway production at a church in NYC. This will be my sixth play, and in every one I have had the opening line.”

1958
Bill Rabinovitch posted on Facebook about the very real possibility of going to the Moon. “Mindboggling,” he writes, about an hour-long press conference with Elon Musk at SpaceX in LA, with Japanese collector Yusaku Maezawa. “Figure I’ve a shot at this, to be on Space X BFR’s first manned flight around the Moon, as this young Japanese billionaire art collector has just stepped forward with phenomenal funds to assist the BFR project and to himself be part of the crew—perhaps even with Musk himself. Yusaku will select six to eight artists to accompany him in 2023, in order to see what they will be inspired to do. As an engineer, jet pilot/space scientist who has worked with NASA—and a longtime artist/filmmaker, I would go in a shot if I’m selected.”

1960
Bruce Maccabee writes, “My most recent book has just been published: The Legacy of 1952: Year of the UFO. This joins my previous three books on the subject, Three Minutes in June: The UFO Sighting That Changed the World, Abduction In My Family, and the classic history of the early days of UFOs and flying saucers, The FBI—UFO Connection. All four books are available at Amazon, or contact me through my web site, www.brumac.mysite.com.”

1961
Bill Rabinovitch posts this recap, “Finally finished WPI after Prof. Carl Koontz (CE) hired me to work on a government-funded study as I completed a degree in economics. It was there that I met an incredible girl, Carolyn. She had worked in two WPI departments, and had an office in the Alden Memorial Bell Tower, near Professor Lewis Curran’s. (Carolyn was an honorary member of the Men’s Glee Club.) We left after 10 years, for the ‘big money’ in the outside world.

1962
Douglas Pike sends this recap, “After a career at Monsanto and a stint in consulting, I returned to school and graduated magna cum laude, obtaining a license as a doctor of chiropractic also licensed in acupuncture. In 2009 I left my practice, and with my wife, Susan, moved to the woods on a farm of 134 acres with dogs, cats, chickens, gardens, a fish pond, and an orchard. I still see 10-15 patients every Tuesday as a mission rather than a business. In November I’ll celebrate my 90th birthday and am so thankful for the health and stamina I’ve been blessed with.”

1963
Bob Magnant writes, “My latest book, We are all Storytellers, has finally arrived, and you can download it to all of your Apple devices. It has been almost a year since I posted my first iBook, and now I’m looking for allies to achieve consensus and to gain some momentum.”

1964
Elliot Whipple tuned in to the All-Star Baseball Game in July and recognized a WPI classmate in the pre-game ceremony to honor recipients of the Medal of Honor. Brian Thacker, a TKE brother, started with the Class of 1967 and left WPI to join the ROTC program at Weber State College in Utah. He served as a 1st Lieutenant in Vietnam with the Army’s 1st Battalion, 92nd Artillery. In 1971, under fire in Konturn Province, he risked his life to enable the team he led to withdraw to safety, and was then stranded for over a week without food or water before he could make his way back to base. He was awarded the Medal of Honor by President Nixon in 1973.

1965
Brian is one of the heroes profiled in Medal of Honor, Portraits of Valor Beyond the Call of Duty, by Peter Collier, in a chapter called “Eight Days in the Forest.” He tells his story in a related video posted on YouTube, and urges soldiers to reach out for support on a message on the Medal of Honor Speakout website.

1966
Dwight Eddy reports several changes in his life. “Retired at the end of October 2017 from Synopsys, after working there for 21 years. Moved at the end of July 2018 from New Hampshire to Naples, Fla., after living there for 33 years.”

1967
Joel Cohn writes, “I’ve moved to the seaside town of Cambria, Calif., but I’m failing at retirement. Still working part-time doing environmental studies. I’m making time to bicycle along the Pacific Ocean on Highway 1, building and flying RC model airplanes, and I just finished acting in a play at our community theater. (A shout-out to my Masque co-alumnus!) Looking forward to attending the 50th reunion and reconnecting with ’60ers I haven’t seen for a while.”

1968
Cary Palulis shares, “Susan and I finally retired. I put in just under 50 years in the oil/chemical business, and I wouldn’t trade it for any other career. However, I do not miss the airlines, hotels, or rental cars. We have a house in Port Saint Lucie, Fla., and will still spend summers in Avon, Conn. Our daughter, Lauren, teaches six miles away from our Connecticut home. Golfing and fishing a lot more, and catching up on house maintenance projects. I still see many of my classmates and fraternity brothers often, usually for golf, boating, or sporting events.”

1969
Brian is one of the heroes profiled in Medal of Honor, Portraits of Valor Beyond the Call of Duty, by Peter Collier, in a chapter called “Eight Days in the Forest.” He tells his story in a related video posted on YouTube, and urges soldiers to reach out for support on a message on the Medal of Honor Speakout website.

1970
Rakjijan “Ron” Hirant writes, “I have always been proud of being a WPI graduate. At first I thought I was just lucky, but after three jobs I knew for sure it was the three letters ‘WPI’ that made the difference. Even though most people I met did not even know where Worcester was or how to pronounce it, I was always pleasantly surprised when they knew all about WPI. I was hired by Farrell USM in Ansonia, Conn., through the WPI recruiting department. After four years, we moved to Los Angeles to escape from the East Coast’s four seasons with freezing winters, and ‘HHH’ (hot, humid, and hazy) summers. Now we enjoy the LA’s two seasons: Summer and Pollution.”

(continued)
I worked at Garret Corp. Air-Research Co. (now Honeywell) for eight years. I was hired by my current employer, The Aerospace Corp. in El Segundo. I'm now a senior project engineer for the GPS program. WPI made news in Money magazine's September 2018 issue with the popular Great Problems Seminar for first-year students, helping them understand the environmental and societal causes of problems before they set out to create technical solutions. RPI, eat your heart out!

Jim Ingraham writes, “We left Massachusetts in 2018 and followed our sons and two grandchildren to California. We are now living in Santa Barbara. After working at MIT Lincoln Laboratory for 14 years, I am now heading up operations at Raytheon Vision Systems in Goleta.”

1975

Robert Andre writes, “Presently living in Myrtle Beach, S.C., and have been retired for five years. Eddie and I have six grandchildren (two more were expected at press time). We took a 13-day cruise in the Mediterranean in May, and a trip with our travel trailer to Michigan (NASCAR), Massachusetts, Connecticut, and New Jersey, visiting our children. We have another trip planned to New Orleans, Alabama, Mississippi, and the west coast of Florida.”

Paul Loomis writes, “Since May 2018 I am officially retired from the working world! Hooray! I worked for Olin Corp. and its spinoff Arch Chemicals, in the swimming pool chemicals group from 1979 until I became disabled in 2010. It was truly a great experience, and I enjoyed the professional and financial rewards, made possible by WPI. This weekend [9/9/18] my wife, Theresa, and I are celebrating our 40th anniversary. Last weekend I visited fellow classmates George Kingsley, Dave Eves, and Dick Oswald on a bit of a whirlwind tour of New England. Great fun, and the first time Dave and I had seen each other in over 43 years! Just like old times.”

1978

Greg Dunnells sends in his first update to WPI. “Back from our sojourn in Arabia. Did almost two years in Saudi, we could not handle the culture. Then three years in the UAE. Finally decided that we needed to come home to Texas. Have a golden retriever puppy that is either a pleasure or a complete PITAs. (Mostly a pleasure.) At the moment I’m retired, but seeking employment. Very much enjoying rain and green things.”

John Mcgee writes, “Donna (Philbrook) ’80 and I are still living in southwest Virginia. I recently retired from Wolfram Research and now teach part-time at Radford University.”

Pat Nicholson writes, “I am enjoying working at my own company and just passed 20 years in business in fire risk management. My work takes me all over the country, and after 11 years in Minnesota (Stillwater rocks!), I am now in Mississippi (Vicksburg rocks!). I get to visit home in Falmouth, Mass., but not as frequently as Chris and I would like. All four kids are on their own and living successful lives. A big shout-out to my friends from WPI—you know who you are—and also to my favorite professor, Bob Fitzgerald, who guided me along the path of working in fire protection engineering.”

1979

Sigifredo (Fred) Gonzalez writes, “Took early retirement in 2010 and moved overseas. Will probably move back to the U.S. in a few years.”

J. Paul Spinn (’97 MS FPE) shares, “It’s been a busy year renovating our house. Lynda and I are planning a trip to the Blue Ridge Mountains in the fall while visiting family. Work is good, but it’s hard to believe that I’m also planning for retirement.”

1980

David D’Antonio writes, “Thirty-plus years ago, on a fine fall day, I walked across Earle Bridge and onto the Quad; my destination was my dorm room on Daniels 3rd. It was an exciting time; going for a computer science degree back when there were punch card machines in WACCC in the library basement! I met lots of cool, smart, and friendly people, some of whom I’m still in touch with today. But finances intervened and I had to put it all aside.

“In 2018, on a rainy spring day, I again walked across Earle Bridge and onto the Quad but this time my destination was the stage where I would finally graduate with a bachelor’s degree! With family in the audience and even a mention from President Leshin, I completed the journey I had started more than three decades ago.

“If I can give any advice, it would be to persevere; there will be obstacles and detours, but you can complete important journeys; I did and I know others can, as well.”

Carlos Maltos writes, “Mexican born, and now living in Mexico City as a consultant financial independent advisor. In love with and proud of my México!”

1981

Mark FitzMaurice writes, “Here I am in Worcester, England, this past summer, in my WPI shirt and ball cap, feeling very much like the sign on the store says (Bygones of Worcester)! Hard to believe how fast the last 37 years have gone. Lots of great memories, though. If you are looking to hang out with a WPI alum and you happen to be in Portland, Ore., let me know.”

1982

Gary Adams was honored by Commscope during the company’s 2018 Innovators in Action Summit. He was one of more than 100 global employees recognized for their creative work and ideas that bring innovation to the wired and wireless industries the company serves.

Boston-based real estate attorney Paula Curry was selected for inclusion in Woodward & White’s 2019 edition of The Best Lawyers in America. A partner in the real estate practice of Sherin and Lodgen in Boston, she is a graduate of Boston College Law School.

Ingrid Siembek (’89 MBA) writes, “Tomorrow (9 September) will be 12 years to the day that I arrived with my husband and two cats in Switzerland, where my aim since arrival has been to gain Swiss citizenship. After meeting the criteria earlier this year, we are making our way through the process. While waiting, I continue to work through my company. Inaccord AG, providing contract management services to small- to medium-sized technology companies.”
1983

Andrew Crosby writes, “My company, ABCrosby & Co., an Ashburnham, Mass., industrial and commercial furniture manufacturer, had a small role in the construction of WPI’s Foisie Innovation Studio. Working with Morton Co., we designed and produced custom laminate table tops for the Noiles Teaching Laboratory. These silver laminate tops and the complementary-colored Lista benches bring a new state-of-the-art energy to the lab.

“Another fun fact is that not only were these tops supplied by a WPI alumnus, but a current WPI student helped manufacture them,” he says. My son, Dan, a senior majoring in Bio/ BioChem, worked on the production floor this summer and helped produce these tops.”

Jude Russell recently set up and ran the sound for a 2,500-person yoga class in West Hartford, Conn. — the 8th annual “Om Street: Yoga on LaSalle Road” event. The system included digital delays to satellite PA systems (the road is 800 feet long). “I was on the street at 4:30 a.m. to set up for the 8 a.m. class!” she writes. A consulting engineer (specializing in power quality since 1995 through her company, PowerLines), Jude has been teaching yoga since 2008 at West Hartford Yoga, where she is an integral part of the studio’s teacher training program.

1984

Irene Sotiriou writes, “I am still working as a project manager for New Hanover County Schools in Wilmington, N.C. Just came back from a trip to Greece, visiting family on the island of Corfu. As I write this note, we are evacuated due to Hurricane Florence and pray for the safety of everyone in her path.”

1985

Marge Motyka recently completed teaching the 9–10 grade Christian Education classes at St. Malachy Parish in Burlington, Mass. Forty students completed the program.

Amy Swotinsky writes, “I was promoted to VP of marketing for IBM’s North America Technology Services business, where I’m responsible for setting the marketing strategy for IBM’s largest business unit and geography. This is a welcome change that allows me to give my well-worn passport a rest, having traveled across Africa and India in my previous role.

“Last year I became the vice chair of the board for The Possibility Project, a nonprofit organization that empowers teenagers to transform their lives and communities. I am a member of WPI’s Women’s Impact Network (WIN). Still living in and loving NYC. I continue to be a lifelong Red Sox fan and can often be found at an early morning boot camp.”

Jean-Pierre Trevisani sends this update. “I’m still living in the Paris, France, area. I’ve recently changed jobs to join DBV Technologies as SVP & CIO. We have offices in the U.S., so after many years without visiting, I will be traveling back regularly. Mainly to NYC and around the Newark, N.J., area, but it creates the conditions for an escape to WPI. I’d be happy to connect with any alumni in the vicinity.”

1987

David Arcidiacono writes, “I’ve completed my 31st year with Sikorsky Aircraft, designing next-generation helicopters to support the men and women who protect our country. Michelle and I have four kids, ranging in age from 15 to 22. (Hello, college bills!)”

1989

Mark Macaulay met up with Matt Beaton ’01 at Berkshire Medical Center during the ribbon-cutting ceremony for the organization’s new CHP system and microgrid. “As Massachusetts Secretary of Energy and Environmental Affairs, Matt was excited with this installation being the first MassDOER-sponsored microgrid in a critical facility,” he writes. “Great day!”

1990

Michael McGreal (MS FPE) reports that Firedyne Engineering is celebrating its 25th anniversary. He established the fire protection engineering and code consulting firm in 1993.

1991

Holly (Morrison) Zimmerman recently published Ultramarathon Mom: From the Sahara to the Arctic, her chronicle of extreme running in some of the harshest and most beautiful places on Earth. Her races include the 257-km Marathon des Sables across the Sahara Desert, the Polar Circle Marathon in Greenland, and the Tenzing Hillary Everest Marathon. Now living in Germany with her husband and their four children, Holly works part-time in the tech industry and spends every spare moment running and racing.

1992

Dave Andrade writes, “I am happy to announce that I’ve been promoted to senior K-12 education strategist at CDWG. I will still assist schools with educational technology projects, planning, integration, and implementation, as well as consulting on other educational issues including professional development, learning space design, new technologies, security, and student data privacy. I retired from being a paramedic in 2010 after a serious back injury.” He adds, “I am also enjoying life with my wife, Cori, daughter, Abby (5), and our two cats.”

1993

Jeff Rembold writes, “My wife and I took four of our kids on a couple of camping trips over the summer, in West Virginia and along Lake Ontario. I continue to enjoy my work as an IoT technical presales engineer for PTC—learning new things all the time!”

1994

The parents of Christopher Graser write, “It is with great sadness that we notifying you that our son passed away unexpectedly on March 3, 2017. We will always remember Chris’s wonderful years at WPI. He was employed at ITT/Goulds Pumps at the time of his passing.”

1995

Patrick Delahanty and his wife, Svetlana Chmakova, are proud to announce the birth of their first child, a son, Iaiden, born May 3, 2018. Patrick and Svetlana were married in 2015 and live north of San Francisco, where Patrick works for TWiT.TV, a podcast network founded by Leo Laporte from TechTV.
Charles Gillis recently brought the vision of kinetic sculptor Anne Lilly to life. He performed all engineering design activities to produce her latest public art piece, including producing stamped engineering drawings, shop fabrication drawings for all components, and supporting construction and installation. The work, “Temple Of Mnemon,” is installed on the Rose Kennedy Greenway in Boston. Charles is an instructor in WPI’s Continuing and Professional Education Division.

Erica Iuzzolino Leonard and Darlene Prochniak Bohm, both BSMEs, reconnected after 20 years and now work together at Sikorsky Aircraft. Erica is program director for the Canadian Maritime Helicopter Program, and Darlene is a manager of business analytics. Together they presented “Utilizing Analytics to Simplify Estimates at Complete,” a key measurement of program execution, at a worldwide conference in 2018. Erica adds, “It has been amazing to not only to have reconnected, but to have an even stronger friendship than when at WPI.”

After working in the specialty geotechnical construction industry for 23 years with two area firms (Terra Drilling Company and Moretrench American Corp.) whose offices closed shortly after selling out to larger competitors, Bob Tonning decided that the only way to avoid a third acquisition was to build a new company from scratch. “And from the ashes,” Phoenix Foundation Company Inc. arose in the spring of 2018,” he recounts. Together with fellow WPI, AXI, and Moretrench alum Connor Johnson, Bob and company look to partner with clients throughout New England and beyond, building upon the strong foundations of nearly a quarter-century of experience, expertise, and relationships.

1996
Joseph Maraia, a partner at Boston-based Burns & Levinson, was named to this year’s “IP Stars” list by Managing Intellectual Property magazine.

Carrie Rocha, a vice president at HNTB Corp., was named Atlanta office leader. She previously served in a similar role for HNTB’s Connecticut operation.

2000
Ben Nawrath writes, “My wife, Jess, son, Jack, and I recently made the trek from Long Island up to York, Maine, for a mini family reunion! Some highlights of the trip for the 4-year-old were seeing a submarine in Groton from the ferry, playing in tidal pools, jumping waves with his cousins and Pop Pop, and going inside every single tent at LL Bean—four times! A highlight for me was finally showing Jess the WPI campus, even if it was from the car, and a lunch stop at The Boynton, an old favorite. It was great seeing the changes on campus, and I hope to bring them back up again soon!”

Victoria Valentine and Daniel De Dominic got engaged in March. A week or so later they visited campus and snapped a photo with “The Proud Goat.” The wedding is being planned for January.

2001
Paul Lamson-LaPlume (né LaPlume) writes, “I just started my 14th year of teaching at Yarmouth High School in Maine. By choice my role has expanded from math teacher to include our fledging computer science program and my continued passion for robotics.”

A group of WPI alumni working in the aerospace industry in the Los Angeles South Bay have established a regular happy hour gathering at Flights brewpub in Hawthorne, Calif., reports Amanda (Kight) Muller. Together they share memories of DAKA, IQP adventures, and the changing male-to-female ratio at WPI. The clan includes Justin Stocker ’11, Kevin MacDougall ’16, Abby Cervelloni ’16, Matt Murphy ’17, Brian Dumaine ’95, Amanda (Kight) Muller ’01.

2004
Tim Baird announces the publication of his second novel, Washington’s Dragon Hunter. “This is the exciting continuation of the Dragon in the Whites book series, and is available exclusively on Amazon,” he writes.

Brooke (Buchholz) Tropf participated in her first spacecraft launch this summer. She has worked on software for the Parker Solar Probe for the past four years, and she supported the launch from the Mission Operations Center in Maryland. “Although it was slightly disappointing not to be able to see the launch in person,” she writes, “it was very exciting to be in the MOC, waiting for telemetry to come in, and watching the software get the spacecraft into a safe, power-positive state. I continue to support Parker Solar Probe operations and am now getting started on my next mission, DART, scheduled to launch in 2021.”

Krystal (Tam) Yong writes, “We celebrated our daughter Ariel’s 6-month birthday this week!”

2005
William Herbert sends this update. “I have moved out of Boston and New England after calling the region home since arriving at WPI for NSO in August 2001. I have started a new role as a software engineer with The Walt Disney Company in Celebration, Fla., right around the block from Walt Disney World! I am very excited about the new job and equally excited about the warmer climate. Upon leaving Boston, I donated over a dozen scarves, five pairs of gloves, and four winter hats that I no longer have a use for!”

2008
Nicole DeCampo and her wife, Christine, welcomed their son, Lincoln Richard DeCampo, to the world on July 15. “He arrived a little over a month before his due date!” Nicole writes. “Big brother Mason loves having a little brother and both are already equipped with WPI gear!”

Mark Filomeno and his wife, Sandra, are excited to announce the arrival of their first child, Nikolas Mark Filomeno. “Both Niko and Mom are doing well,” Mark reports.
Dave Willens writes, “After graduating with my BS in mechanical engineering and manufacturing engineering, I took advantage of the BS/MS Program and earned a master’s in ME. My full-time employment began with Kinfac Corp., a metal forming machine tool builder in Worcester, which supported my summer internships while in college. I am now director of research and development. I’m also working on a PhD at WPI concentrated in materials science and metal forming, and I serve as the Phi Gamma Delta fraternity graduate advisor.

“This year I co-authored and published a book, Wain-Ray and the Invention of the Backhoe, which captures the story of how this popular earth-moving innovation was invented and developed locally using oil hydraulics in the late 1940s, and how it led to a multibillion dollar world-wide industry. I also co-authored a chapter (“Rolling Process”) in the McGraw-Hill Manufacturing Engineering Handbook. In my spare time I enjoy restoring antique cars, tractors, and machinery, and traveling the world.”

Samantha Wentzell and Tyler Carroll ’10, ’15 (MS CS) were married at Bourne Farm in Falmouth, Mass., on July 8. They were married by family and friends, including several WPI alumni.

This year Elena Ainley became Sr. Maria Mechtilde, OSB (Order of St. Benedict). She was clothed as a cloistered contemplative Benedictine novice at St. Scholastica Priory in Petersham, Mass. “The nuns and monks of the twin Roman Catholic monastic communities in Petersham chant the Psalms antiphonally in traditional Latin Gregorian chant,” she writes. “I’m grateful for my theatre major, because singing in front of people every day can be daunting!” She adds, “Sr. Mechtilde is extremely happy and excited to have found her calling!”

John Wilder writes, “I recently started a new job at Hanscom AFB working on the AWACS program. In my Masonic involvements, I am halfway through my first year as captain-commander of the Aleppo Shrine Minutemen, and I have recently affiliated with Boston Commandery #2, KT.”

Kokui (Francisa Dzefi) Adesokan writes, “I created Kokui’s Atelier after graduating from WPI with my MBA. I created the business to provide opportunities for others and to inspire women to express themselves. I must launched head scarves in my online store, kokuisatelier.com. I still work as an assistant engineering manager during the day and manage my business after work.”

Maddie Burris writes, “While at WPI, I did not have the funds to experience the destination IQP I so desired. However, I’m proud to share that I finally made it to Costa Rica. While it was not a 7+ week excursion, it was incredible all the same.”

Maddison Caron writes, “I just began a job at Massachusetts General Hospital as a cardiac device technician.”

Ama Biney writes, “After graduating in May, I started my first job with United Technologies Corp., in the Operations Leadership Program (OLP). Classmates Nde Nkimbeng and Brendan Nemes also joined me in the OLP. Here in West Palm Beach, Fla., I am working in commercial supply chain, which has been both challenging and fun! In my free time I enjoy taking advantage of the sights and sounds of Florida. As an ex-athlete it has been fun to find different leagues to plan in to stay active.”
ALEX PAPIANOU, Class of 1957

The WPI Community mourns the loss of Alex Papianou, known by many as “Al Pappy,” on Nov. 15. A dedicated member of the Class of 1957, he received a BS in chemical engineering, and went on to earn an MS at Northeastern University and an MBA at Suffolk University. He was a brother of Theta Chi; he participated in Masque, Men’s Glee Club, Track, and ROTC. He was tapped along with the Skull Class of 1998.

Al embodied WPI with his love for learning, his helping students thrive, and his passion for maintaining long-lasting connections with friends and alumni throughout the years. He received the Herbert F. Taylor Alumni Award for Distinguished Service to WPI; he served as vice president of Tech Old Timers and as vice president of the WPI Alumni Association; and he was instrumental in planning many Class of 1957 reunions. He leaves his wife, Marcia, and their children, Beth Papianou Giobbe ’83, David Papianou, and Todd Papianou.

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