"They did nothing to deserve this."

Fighting for Flint: A Virginia Tech team exposes lead poisoning

Fantastic Four
Meet Virginia Tech's first quadruplets

Class of 2047
Envisioning the university of the future

“Take Big Swings”
Entrepreneur empowers online publishers

“THEY DID NOTHING TO DESERVE THIS.”

Fighting for Flint: A Virginia Tech team exposes lead poisoning
Eroding trust: (Above) Ph.D. student Anurag Mantha, a key member of the Virginia Tech team that brought national attention to the crisis in Flint, Michigan, meets with a Flint resident during a spring break visit in March. (Left) On the city’s decades-old unofficial community message board known as The Rock, one resident expressed disdain for PSI, a business the city hired to test the water, and a special bond, Virginia Tech’s first set of quadruplets have found their own paths.

Class of 2047
Envision the future: If, a generation from now, Virginia Tech has succeeded beyond its wildest dreams, what will it look like? And how will the university position itself to solve society’s most vexing problems? These topics are on the minds of the university’s leaders, three of whom share why they’ve chosen to make Blacksburg home.

Fantastic Four
One is Evel Knievel, another is ever careful. One’s a troublemaker, another a teacher’s pet. While they share a birthday and a special bond, Virginia Tech’s first set of quadruplets have found their own paths.

Fighting for Flint
Poisoned by lead-tainted water and ignored by elected officials and government agencies, residents of Flint, Michigan, turned to Virginia Tech’s Marc Edwards, who led a team of students into an ongoing crusade to protect the public’s welfare.

“Take Big Swings”
Ads are to the Internet what April showers are to May flowers: inevitable, inconvenient, indispensable. Sourcepoint, the latest company launched by entrepreneur Ben Barokas (agricultural and applied economics ’96), seeks to empower advertisers and provide compensation to publishers that provide us with all of that free content.

On the cover and at right: Gavin Walters, with his mother Lee-Anne, holds a bottle of water taken from his home in Flint, Michigan—water that gave him lead poisoning. Photo by Logan Wallace.
People aspire to lead meaningful lives. This aspiration is a key factor that contributes to our overall sense of well-being—and it’s also one of the reasons students choose Virginia Tech. This issue of Virginia Tech Magazine is being shared with families of our undergraduates. If you are a new member of the Hokie Nation, I want to take a moment to say welcome, and thank you for being part of our community. With the efforts of our dedicated faculty and staff and remarkable leadership from such people as Vice President for Student Affairs Patty Perillo and Provost Thanassis Rikakis, a Virginia Tech education can be a transformational experience for students, their families, and their communities.

I’ve often said that Virginia Tech can become known as the “service-to-humanity academy.” We proudly live our motto, “To Serve.” To our overall sense of well-being—and it’s also one of the reasons students choose Virginia Tech. This issue of Virginia Tech Magazine is being shared with families of our undergraduates. If you are a new member of the Hokie Nation, I want to take a moment to say welcome, and thank you for being part of our community. With the efforts of our dedicated faculty and staff and remarkable leadership from such people as Vice President for Student Affairs Patty Perillo and Provost Thanassis Rikakis, a Virginia Tech education can be a transformational experience for students, their families, and their communities.

I’ve often said that Virginia Tech can become known as the “service-to-humanity academy.” We proudly live our motto, “To Serve.” To a second-grader, Bryce, reading your spring 2015 article, “Firefighter Earns Sea Legs.” This kid has been telling us for about a year that he wants to become a robotics engineer at Virginia Tech! This article is awesome. Not only are you showing how great Virginia Tech’s programs are, you’re inspiring the next generation.

Valerie Moore Mullins (management ’92), Clayton, North Carolina
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Family matters:
For the full Q-and-A, visit vtmag.vt.edu. For more information on the Division of Student Affairs Parent Committee and other resources for Hokie families, contact Penny Helms White, director of family and alumni relations, at phwhite@vt.edu or 540-231-3284.

College of Science dean named
Sally C. Morton, professor and chair in the Depart- ment of Biostatistics in the Graduate School of Public Health at the University of Pittsburgh, will begin July 1 as Virginia Tech’s College of Science dean, succeeding Lay Nam Chang.

Provost Thanasia Rika-kis said that Morton “has a strong record of research and scholarship and brings great strength in her collaborative, multidisciplinary approach to programs, research, and leadership. Her unique combina- tion of experience and leadership bridging academia and industry will enable the college to continue building innovative programs and leverage existing and emerging strengths in ways that will advance the college and the university.”

At the University of Pittsburgh, Morton also directs the Comparative Effective- ness Research Center in the Health Policy Institute and holds appointments in the university’s Graduate School of Public and International Affairs, Department of Statis- tics, and Clinical and Translation Science Institute. She has more than 30 years of experience in academic and research settings, focusing on patient-centered comparative effectiveness and evidence synthesis.

Drillfield

What made David choose Virginia Tech?
In high school, David liked his chemistry and physics classes. He wanted to major in chemical engineering. David wanted a large campus and a college with a great school spirit. David also liked the architecture of the buildings, the large Drill- field, and the overall welcoming feel on campus.

What did David do outside the classroom that enhanced his education?
David developed a mentor relationship with Preston Dur- rill, one of his chemical engineering professors. Working with Career Services, David secured an internship with Bayer and a co-op with Cargill, giving him opportunities to “test-drive” the direction he wanted to go.

Why is it important for families to be involved in their stu- dents’ education?
The college experience is what you make of it. That includes the students and their families. When families are involved and knowledgeable, they can help guide their children’s ed- ucation and pursuit of a career.

What are you most proud of?
We are most proud of David’s perseverance. He has a can- do attitude. Chemical engineering is a difficult major and David had to study hard. He learned not be disappointed by setbacks and to overcome barriers. Due to an unfortunate childhood injury, David learned during his first year at Tech that he would need two additional surgeries on his right knee. During winter break, he had his first surgery and returned to campus in January. Schiffert Health Center removed his sutures. His next knee surgery, a cartilage transplant and bone graft, occurred that summer. He had 10 weeks of physical therapy. Again, David returned to college, navigated the large campus, and maintained his academic schedule.

Why did you become involved with the parent committee?
Our daughter, Rachael, attended Indiana University. We at- tended parents weekends and football games but never felt connected to the university. When we were asked to join the parent committee at Virginia Tech, however, we thought it was a great opportunity to learn about the university’s past, present, and future. We feel like Hokies and are connected to a great community.

The Virginia Tech experience: A parental perspective

We recently had a chance to talk with David’s parents, Steve and Terri Tunick of Sewickley, Pennsylvania, who are members of the Division of Student Affairs Parent Committee at Virginia Tech.

When David Tunick graduates this spring, he will leave with a degree in chemical engineering and a wealth of career-related experience. Alongside his academic pursuits, David found a mentor, joined a fraternity, was a member of a living-learning community, and lived the university motto, Ut Prosim (That I May Serve).

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During Benson’s tenure at Virginia Tech, faculty members adopted a hands-on, minds-on philosophy of learning, an approach that produced highly sought-after engineering graduates.

“Under [Benson’s] leadership, our College of Engineering has experienced record growth—doubling the number of students and growing enrollment to close to 8,000 undergraduates and 2,300 graduate students—and the college is at its highest-ever ranking in the National Science Foundation’s report on engineering schools’ research expenditures, with more than $200 million,” said Virginia Tech President Tim Sands.

“The national and international reputation of Virginia Tech engineering has never been stronger because of all that [Benson] has accomplished.”

In 2014, Benson presided over the opening of Goodwin Hall, a $100 million building that includes classrooms, an auditorium, and more than 40 instructional and research laboratories and offices.

Virginia Tech received a record 25,200 undergraduate applications for admission to the Class of 2020. The pool includes an 8 percent increase among 15 students from 65 countries, a new national record 25,200 undergraduate applicants and is the most diverse student pool ever.

Swimmer Brandon Fiala represented the Atlantic Coast Conference (ACC) on the voting delegations at the 2016 NCAA Convention. Fiala was among 15 students from 65 universities in the ACC, Big 12, Big Ten, Pacific-12, and Southeastern conferences.

Invasive plant expert Jacob Barney, assistant professor in the Department of Plant Pathology, Physiology, and Weed Science, briefed congressional staff members on increasing the use of plants for biofuels without sowing an environmental nightmare.

Although plants used for biofuels remain a vital player in creating more forms of alternative energy, careless planting can lead to an unwanted invasion of exotic plants that can push out native species and create ecological havoc.

Robo-roaches and ethics

Two cockroaches scuttle into earthquake rubble looking for survivors. One cockroach is a robot, driven by remote control. The other cockroach—a living insect—bears a backpack wired with electrodes that allow the bug to be steered using a smartphone app.

Which cockroach does the job better? Are both options ethical?

Students enrolled in Michael Colliver’s robotics class at Blacksburg High School are debating those questions in a course unit developed by Virginia Tech researchers David Schmale and David Lally and local educators Colliver and Cindy Bohland.

The project, “Wired for Controversy: i-Cockroaches vs. RoboRoaches,” which encourages students to think critically about the ethics of new technologies, such as drones and autonomous vehicles, was highlighted in the December 2015 edition of The Science Teacher.

“Autonomous vehicles are poised to become part of our everyday lives, and scientists are now studying ways to integrate similar robotic technology into living organisms,” said Schmale, an associate professor of plant pathology, physiology, and weed science in the College of Agriculture and Life Sciences and a Fralin Life Science Institute affiliate.

“Insect cyborgs could one day be used for military intelligence and rescue operations, and we need to develop scientifically literate citizens to make well-reasoned ethical decisions about the potential use of this technology.”

Land-grant lager

Long known for research and outreach that has boosted the commonwealth’s wine industry, Virginia Tech now has a brewhouse in the Department of Food Science and Technology’s Innovation Collaboratory designed to serve Virginia’s burgeoning craft beer businesses.

Ingredients for a Virginia Tech land-grant lager:

Research—Carl Griffey, professor of crop and soil environmental sciences, is developing winter malt barley varieties suitable for the eastern U.S., and the brewhouse offers him a quality-control lab. And Holly Scoggins, associate professor of horticulture, has just planted an experimental hops yard to help identify the varieties that grow best during Virginia’s shorter summers.

Learning—The gleaming, German-built, 2.5-hectoliter Esau & Hueber system teaches students about malting, brewing, and fermentation. Some of the machinery’s automation has been removed to force students to learn, for instance, when to throw the valves to control temperature. “If you make a mistake, you’ve got to learn how to fix it,” said plant manager Brian Wiersema.

Sustainability—Researchers are investigating methods to turn used barley into plastic and fuel, and the brewhouse itself runs as a true farm-to-glass operation.

Economic outreach—Regional breweries can use the facility, which has a capacity of 66 gallons of beer per batch, to develop new varieties of ales and lagers and to test local ingredients without taking their own facilities off-line. Also, the brewhouse could help attract breweries to the area, while the agricultural research may yield new crop varieties for farmers.

Global education—The university is planning a partnership with the Technical University of Munich, where students could test their classroom experience in the heart of Bavaria.

Good cheer—What could be better than taking a college course in advanced malting and brewing? Well, the Innovation Collaboratory will soon have a distillery unit for research and education.

The bad news for Hokies longing for a taste of land-grant lager: the student-brewed beer isn’t available for public consumption.
Brian Mathews is associate dean for learning in Virginia Tech’s University Libraries.

Q: Do libraries have a future?

A: When people ask this question, what they usually want to know is whether print books have a future. The assumption is that as more information becomes available online, we won’t need books and therefore won’t need libraries.

It’s unlikely that the book format will ever completely go away. Librarians, though, are focused on an even larger question: How will the shape of knowledge evolve? We are concerned with how information is collected, organized, described, and utilized. Although there is a lot of content online, that doesn’t mean it is free. We work hard to provide people with seamless access to what they need.

We’re also concerned about future compatibility. As formats and operating systems change, the files and tools that we use now might be obsolete in 10, 20, or 100 years. Libraries are in it for the long haul. We want to ensure that the information created today is available tomorrow.

Learning is changing, too. Students are writing code, designing graphics, composing videos, and developing Web content. They participate in undergraduate research programs and service-learning projects, and some students are even launching start-up companies. Librarians aim to support the students and faculty toward being more creative, more collaborative, and more innovative.

We are designing spaces that propel students and faculty toward understanding their duty when they graduate. Librarians teach our children the importance of the flag, how to care for it properly, and what it represents, and how it impacts their lives,” said Forrest Doss, the 2015-16 color guard commander.

“Visiting elementary schools allows us to teach children, who are the future of our nation, the importance of the flag, what it represents, and how it impacts their lives,” said Doss, a junior cadet and Air Force ROTC member from Leesburg, Virginia, who is majoring in computer science. “In addition, by performing various flag details for events, we hope to instill in others an appreciation for this country and the people who brought us all here today.”

For three years, color guard members have worked with the fifth-grade students of the color guard. For an elementary school’s field trip to Virginia Tech, as well as for a visit by homeschooled students.

A dedicated group of 12 to 17 cadets, the color guard is responsible for raising and lowering the flag over the Upper Quad each day, representing the corps and the university at events on campus and around the country, and maintaining all flags and equipment.

The cadets call themselves a faceless organization because their faces are often hidden by the flag. Anonymity is exactly what they want. Nonetheless, the color guard is one of the university’s most recognized symbols and has a significant impact on the campus and community.

“I joined the color guard because I wanted to challenge myself as both a person and a leader. I not only have gained confidence and experience as a leader, but have become a member of a close-knit family that I will remain in contact with for life,” said cadet Adam Moritz, a junior chemical engineering major from Downingtown, Pennsylvania.

Maj. Carrie Cox (M.S. civil engineering ’99) is the Corps of Cadets’ executive officer.

In the past year, color guard members taught at an after-school program for third-, fourth-, and fifth-graders at nearby Dublin Elementary School in Pulaski County; shared their expertise with a Girl Scout troop; visited a preschool, and taught flag etiquette for an elementary school’s field trip to Virginia Tech, as well as for a visit by homeschooled students.
Leonardo da Vinci was a mathematician. Pablo Picasso and Salvador Dalí studied fourth-dimensional geometry. So Sarah Hammer, a junior at Virginia Tech, doesn’t see why anybody would find it remarkable that she’s double-majoring in studio art and mathematics or that she called on her artistic talents to enhance her undergraduate neurobiology research, which led to first-author credit on a published paper.

“I think the mindset that people can’t be both left- and right-brained thinkers is a really big misconception,” Hammer said. “Being an artist shouldn’t imply a lack of skill or interest in mathematics and vice versa. I think artists can learn a lot from mathematics.”

Hammer came to Tech as a university studies major, but quickly fell in love with her fundamental art classes. She was accepted into the art program after a portfolio review. “I really wanted to be in studio art because they have a specific focus called creative technologies,” she said. One year later, Hammer added math to the mix.

Even before arriving at Tech, Hammer combined the two. During her senior year at the Roanoke Valley Governor’s School, she had the opportunity to spend one month on a research project of her choice. Michael Fox, an associate professor at the Virginia Tech Carilion Research Institute, told her about a project involving brain imaging and 3-D reconstructions. She went to work, and Fox became her mentor through high school and into college.

Fox and his team used two different techniques to examine and illustrate how retinal ganglion cells—neurons that live in the retina and transmit information to the brain’s visual centers—develop in a mouse model. In one of those techniques, Hammer traced individual retinal terminals, which had been tagged with proteins that fluoresce different colors, through each of hundreds of serial images captured by an electron microscope. The results, which were published in the journal Cell Reports, challenged accepted theories about intricacies of the brain’s visual circuitry.

“She had to learn how to read all of those images, which is really difficult; it is a skill that takes years and years to teach graduate students,” Fox said. “Whether she ends up in science or in math, or in art, she … has the potential to change any one of those fields because of her different perspectives. That’s why Virginia Tech develops these innovative interdisciplinary programs: to help students excel.”

“It was fun to create something that had scientific meaning, but also had to look good in order to convey all the concepts behind it,” said Hammer, who is an ambassador for the School of Visual Arts and eventually wants to earn a doctorate. “That’s what creating art is, finding a balance between meaning and aesthetic. It’s about communicating an idea.”

Art, math, and the brain: In a piece she described as fractal art (seen at right), Sarah Hammer (above) used repetitive shapes to link her love for math with lessons from art class about color and composition.
A stench in time

Oil smells may cause a wrinkle of the nose, but sometimes they can save lives, too.

Melanie Kiechle, assistant professor of history, studies scents at the intersection of urban and environmental history. She documents how people react to problems they perceive through their sense of smell—such as the 19th-century Industrial Revolution’s pollution in New York City—and what those moments tell us about cultural and societal changes.

One of her studies centered on an 1880s civic dispute over whether the scents of Brooklyn-based industries were carrying to midtown Manhattan. Examining the papers of Charles Frederick Chandler, a 19th-century professor at Columbia University and former president of the Manhattan Board of Health, Kiechle found a map titled “Map showing location of odor producing industries in New York City.”

“Oil refiners used (sulfuric) acid to filter impurities out of the oil, creating something they called ‘sludge acid.’ The oil refiners then sold sludge acid to fertilizer manufacturers, who spread it on carcasses to speed the decomposition process. That had to create a powerful stench,” Kiechle said.

“In 2010, Newtown Creek, which is the creek that runs in between Brooklyn and Queens, was named an EPA Superfund site. That’s the creek they were complaining about in the 1880s. People were realizing that the area was already problematic and dangerous in 1880. It seems so odd today that a bad smell would make people sick, because we think about germs and viruses—but in fact, by reacting to odors, 19th-century New Yorkers were identifying what was indeed dangerous in their own time.”

Long story short

In August, Virginia Tech will host the 2016 Hispanic College Institute, a three-day program for Hispanic high school sophomores and juniors in Virginia. The event was initiated in 2012 by the Virginia Latino Higher Education Network (VALHEN) to combat myths and misconceptions about the college-search process and to prepare Hispanic students for higher education.

The White House recently recognized VALHEN and the Hispanic College Institute as a “Bright Spot in Hispanic Education.”

In an article in the Proceedings of the National Academy of Sciences, Virginia Tech Transportation Institute researchers reported that drivers increase their crash risk nearly tenfold when they get behind the wheel while observably angry, sad, crying, or emotionally agitated. In addition, drivers more than double their crash risk when they engage in distracting activities that require them to take their eyes off the road, such as using a handheld cell phone, reading or writing, or using touchscreen menus on a vehicle instrument panel. According to the institute’s research, drivers engage in some type of distracting activity more than 90 percent of the time they’re behind the wheel.

Cosmopolitan Hokies

Virginia Tech’s Global Education Office helps students explore, learn, and engage with other cultures in order to challenge their assumptions, broaden their perspectives, and understand what it means to be responsible citizens of their nation and the world.

Spring

- 9 programs
- 22 faculty/staff
- 193 students

Destinations:
- Dominican Republic
- England, India, Ireland
- Switzerland, Trinidad
- United Arab Emirates

World travelers: 
- Antarctica, Australia, Costa Rica, Dominican Republic, Ecuador, Italy, Japan, Morocco, New Zealand, Panama, South Africa

Winter

- 15 programs
- 21 faculty/staff
- 214 students

Destinations:
- Antarctica, Australia, Costa Rica, Dominican Republic, Ecuador, Italy, Japan, Morocco, New Zealand, Panama, South Africa

Alumni Distinguished Professor of Spanish Jacqueline E. Bixler and University Distinguished Professor of Geosciences Michael F. Hochella Jr. received the 2016 State Council of Higher Education for Virginia Outstanding Faculty Award.
specific substrates—lactate and formate—produced more energy than either did separately. This work will help take the mystery out of how electrochemically active bacteria create energy and could assist in further developing a new treatment system called a microbial fuel cell. “This is a step toward the growing trend to make wastewater treatment centers self-sustaining in the energy they use,” said Feng. He’s research also includes wastewater ammonia. Mohan Qin, a doctoral student in He’s lab, built a system that recovers ammonia and removes other contaminants while generating electricity. The idea earned an award for best technological advancement from the International Society for Microbial Electrochemistry and Technology.

Waste not: For a video on the wastewater research, visit vtmag.vt.edu.

Flushed with success
Toilet power might be closer than ever to making local wastewater treatment facilities more energy efficient, thanks to research by biological systems engineer Xueyang Feng and environmental engineer Jason He.

An article in Scientific Reports detailed how Feng and He traced wastewater bacteria and discovered that the working relationship between two

School of Neuroscience opening in fall
In early November 2015, the Virginia Tech Board of Visitors voted to create a School of Neuroscience—the first of its kind in the U.S.—to be administratively housed in the College of Science, but with close ties to the Virginia Tech Carilion Research Institute.

The school, which was approved in late March by the State Council of Higher Education for Virginia and will be directed by Professor Harold Sontheim (above), is expected to increase the quality of undergraduate programs and the number of students completing graduate degrees in neuroscience—a broad and interdisciplinary field that seeks to understand the workings of the human neurological system, including decision-making and creativity.

Brain power: For a podcast interview with Sontheimer and a video about Tech’s current neuroscience program, go to vtmag.vt.edu.

Long story short
Devi Parikh, assistant professor in the Bradley Department of Electrical and Computer Engineering, is using images to teach a computer to respond to questions, an innovation that could revolutionize the quality of life for low-vision or blind individuals.

With the outbreak of viruses like Zika, chikungunya, and dengue on the rise, researchers Zhijian “Jake” Tu and Zach Adelman are exploring genetically engineering mosquitoes to be male since female mosquitoes are responsible for d charitable transmission.

During competition for the U.S. Department of Energy’s Wave Energy Prize—which will award more than $2 million in funding—Virginia Tech engineers tested a wave energy converter inspired by the movement of squids through water.

Walter O’Brian (mechanical engineering ’10), the J. Bernhard Jones Professor of Engineering in Mechanical Engineering, was selected as a Fellow of the American Institute of Aeronautics and Astronautics (AIAA).
The warmth of springtime may be upon us, but in the winter we can’t wait on temperatures to melt ice and snow on Virginia Tech’s 22 miles of sidewalks and 34 lane miles of roads and service drives. When frigid weather whips into Blacksburg, more than 300 people—from tractor drivers to shovel wielders—fight to keep dining centers open and classes in session. Here’s how it happens, according to Anthony Watson, associate director of facilities, buildings, and grounds.

1. As the potential for a storm increases, John Beach, chief of staff for facilities operations, starts watching forecast models and talking to the National Weather Service.

2. When snow or a freezing mix is coming, crews pretreat the streets and parking lots (as well as sidewalks and stairs, if there’s time) with 23 percent salt brine taken straight from the tanks at the Power Plant. The process is a vast improvement over the past when the brine was mixed by hand.

3. If more than 4 inches in forecast, administrators post a notice for owners to remove their vehicles from emergency snow routes, which allows plowers to push snow over the curb and into the grass.

4. In the morning of a storm, Sherwood Wilson, vice president for administration, is collecting road-condition and readiness reports to decide along with other administrators whether the university opens, starts late, or stays closed. These days, the decision depends heavily on whether Blacksburg Transit can operate. “If BT can’t run, we don’t open,” said Watson.

5. Once the snow (or ice) starts, eight grounds workers plow roads, loading docks, and service drives in 12-hour shifts. Operators of more than a dozen tractors, utility task vehicles, and skid steers help clear main sidewalks. More than 200 trade shop workers and housekeepers break out the shovels, and student resident advisors even pitch in. “We can touch just about everything on campus in two hours,” Watson said. “It’s really a group effort.”

6. Once the storm is over, workers “that everything hard,” Watson said, widening paths through the snow on sidewalks and roads. Contrast crews clear parking lots (tech workers try to keep parking lot drive lanes plowed during the storm). Assigned people report early, sometimes for days after a storm, to treat any melt that has refrozen.

“All hands on deck: Virginia Tech workers (from left to right) Randy Blankenship, Bobby Owen, Trent Cheeck, Henry Price, and John Terry clear a path near Burruss Hall, while Windell Jones operates the motor grader at lower left.”

—Anthony Watson

“WE CAN TOUCH JUST ABOUT EVERYTHING ON CAMPUS IN TWO HOURS.”

20.0
Jan. 10, 1921

15.4
Feb. 13, 1960

14.1
Mar. 13, 1993

14.0
Jan. 7, 1996

14.0
Dec. 26, 1969

14.0
Dec. 17, 1930

13.6
Jan. 22, 1966

12.4
Mar. 2, 1960

12.0
Dec. 18, 1969

12.0
Dec. 17, 1930

12.0
Jan. 29, 1966
Donors energized by immediate impact

New society recognizes annual gifts

by ERICA STACY and ALBERT RABOTEAU

In a rapidly changing world, the tall task of educating tomorrow’s leaders requires a university that is flexible—and a form of giving that embodies the same flexibility.

Annual gifts—which can be immediately applied toward university priorities—offer flexibility to the university and to donors who are drawn to Virginia Tech’s forward momentum.

Robert Harrison (dairy science ’80), a self-employed farmer who lives in Troy, Virginia, said he’s most comfortable making annual gifts instead of pledging toward an endowment because his yearly income fluctuates in response to a range of factors.

“There are so many exciting things happening at Virginia Tech,” said Harrison, who splits his giving between athletics and the university priorities—offer flexibility to the university and to donors who are drawn to Virginia Tech’s forward momentum.

Virginia Tech has introduced a new giving society, the 1872 Society, to recognize donors who make an immediate impact by giving leadership-level annual gifts. Honoring those who make $5,000 or more in donations during the fiscal year, the society joins three other recognition groups: the Ut Prosim Society, Legacy Society, and Pylon Society.

Virginia Tech’s fiscal year runs from July 1 through June 30. Alumni and friends who had already made qualifying gifts in FY16 were recently informed of their membership in the 1872 Society. Members remain in the society for as long as they continue to make gifts totaling $5,000 or more each fiscal year.

The society has three levels of membership, known as circles of distinction. The Grove Circle comprises those whose qualifying gifts total $25,000 or more, Burruss Hall Circle is for members who have given between $10,000 and $24,999, and Drillfield Circle is for those who have given between $5,000 and $9,999.

The leeway that the university has in spending annual gifts amplifies their value. And the flexibility in making such gifts also appeals to many philanthropically minded alumni and friends. Among the inaugural members of the Burruss Hall Circle are Kryssa Cooper (animal science ’88) and David Cooper (marketing management ’83, M.B.A. ’87), of Encinitas, California, who split their annual giving among the Pamplin College of Business, the German Club, and the university’s lacrosse program.

Those donors whose lifetime giving totals are $100,000 or more, the Legacy Society; for those who have earmarked estate gifts or other planned gifts to Virginia Tech; and the Pylon Society, for those who have given in two or more consecutive fiscal years to academic areas.

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Virginia Tech is a way to express sincere appreciation to our most generous annual donors.

In recognition of people, such as Harrison, who make generous annual gifts, Virginia Tech has introduced a new giving society: the 1872 Society, honoring those who give $5,000 or more during the fiscal year to any area of the university, including athletics.

“There are so many exciting things happening at Virginia Tech,” said Harrison, who splits his giving between athletics and the College of Agriculture and Life Sciences. “I feel that the university recognizes annual gifts instead of pledging toward an endowment because his yearly income fluctuates in response to a range of factors.

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As the sun rises over Blacksburg, the thwack of balls drilling the back of a net fills Virginia Tech’s cavernous Indoor Practice Facility.

“Don’t let her turn you!” shouts women’s soccer coach Charles “Chugger” Adair. Forward Murielle Tiernan maneuvers around defending teammates and scores. There are smirks and smiles all around. Adair’s instructions are easier said than done.

A natural on the field, Tiernan has scored with every body part legal in the game, and opponents have no choice but to double-mark her during goal-threatening opportunities. Despite the defensive efforts, the 5-foot-11 junior from Ashburn, Virginia, is the Hokies’ all-time leading goal scorer, with 39 goals in just three years.

“I’ve never been focused on records or scoring,” Tiernan said. “Honestly, as long as we’re winning the game, as long as we’re doing well, I don’t care who’s scoring, I don’t care how we’re scoring, [and] I don’t care if it’s pretty. I just care that we win.”

Named to the 2015 National Soccer Coaches Association of America All-American third team and the All-Atlantic Coast Conference (ACC) first team, Tiernan, who’s majoring in residential environments and design, is relentless in the classroom, too. She’s been named to the ACC All-Academic Team each year of her college career.

While some players agonize over game film and spend hours getting touches on the ball, Tiernan relies on her strength, speed, and innate ability to be in the right place at the right time. “I just try to go out and do the best I can every game without overthinking it,” she said.

Among her many successes, Tiernan points to Tech’s 2013 trip to the College Cup as an outstanding moment. That year, her penalty kick advanced the Hokies to the NCAA tournament’s Elite Eight for the first time in school history. When the ball hit the back of the net, she wasn’t even aware that the Hokies had won.

Aside from tangling with the best defenders in the country, Tiernan fights another battle. Diagnosed with cystic fibrosis at age 6, she’ll tell you she’s neither amazing nor commendable; it’s just who she is. She’s that good.

The pitch

Delia Maresco, a senior majoring in communication, is a midfielder on the women’s soccer team.
When it comes to water, Maggie Carolan understands that every drop counts.

One of the first students to pursue a new interdisciplinary water degree at Virginia Tech, Maggie is passionate about sustainability and wise water use. That’s what inspired her to join a research team led by civil engineering Professor Marc Edwards that earned international recognition for its role in exposing the water crisis in Flint, Michigan.

Maggie’s work on Edwards’ team has given her an extraordinary opportunity to put her passion to work. Her education has also been enhanced thanks to a scholarship and to donated funding that supports student research.

Though still a sophomore, Maggie is already creating ripples that flow toward a safe, sustainable future.

To learn more about how philanthropy makes an impact at Virginia Tech or to make your own gift, visit givingto.vt.edu.

To picture Virginia Tech in the year 2047—and to prepare the institution for that future—university leaders are refining one guiding concept and undertaking two initiatives:

The VT-shaped Individual

Beyond Boundaries

Destination Areas

In the following pages, three vice presidents new to Virginia Tech reflect on why they’ve chosen to make Blacksburg home.

The VT-shaped Individual: In higher education circles, leaders have made much of the so-called T-shaped learner: one whose disciplinary depth is complemented by interdisciplinary know-how. At Virginia Tech, for obvious reasons, we see a VT-shaped individual: one whose “T” is enriched by technological literacy, informal communal learning, and guided experiential learning.

As Provost Thanassis Rikakis has said, gone are the days when a mechanical engineering major graduates and spends an entire career working with 35 other mechanical engineers. Instead, the mechanical engineer will collaborate with others on diverse, interdisciplinary teams, solving complex problems that evolve over time.

Beyond Boundaries: Peering into the future, university leaders have embarked on the Beyond Boundaries visioning process to identify how to best advance as a global land-grant institution, prepare students for the world in which they will live and work, discover new funding models, and envision what Virginia Tech might look like in 2047, the university’s 175th anniversary.

Destination Areas: In the near term, before the university’s sesquicentennial in 2022, Virginia Tech will be deeply involved with proposed Destination Areas—sites of interdisciplinary collaboration where experts are positioned to address the full complexities of broad problems—all while the university maintains comprehensive excellence across Tech’s colleges and research institutes.

CLASS OF 2047
ENVISIONING THE FUTURE

To learn more about the visioning process and Destination Areas, visit beyondboundaries.vt.edu and beyondboundaries.vt.edu/destination-areas.

The first five Destination Areas, now under development, are:

• Data and Decision Sciences
• Integrated Security
• Intelligent Infrastructure and Human-Centered Communities
• Resilient Earth Systems
• Adaptive Brain and Behavior Across the Life Span
Executive Vice President and Provost Thanassis Rikakis is a tenured professor in the Department of Biomedical Engineering and Mechanics in the College of Engineering and holds a joint appointment as a music professor in the School of Performing Arts in the College of Liberal Arts and Human Sciences. Formerly the vice provost for design, arts, and technology at Carnegie Mellon University, Rikakis earned doctoral and master’s degrees from Columbia University and a bachelor’s degree from Ithaca College, all in music composition.

**Why Here? Why Now?**

In a time of unprecedented disruption, the field of higher education faces a number of challenges—challenges that are also opportunities to rethink how we do business.

First, personalized learning will become the norm. For too long, higher education has held up a narrow definition of excellence. We must move toward an inclusive system of education that allows for different ways of learning. Why? Multidimensional knowledge and achievement feed diverse approaches that are better suited to deal with the diverse complexities of societal problems.

Second, universities are beginning to understand that graduates with disciplinary specialization also must be connected, in an interdisciplinary fashion, to a problem’s full range of complexity. Security, for example, isn’t just code, but is also interpersonal relationships—and about understanding differences in circumstances and motivations. If we are to produce graduates who can embrace complexity, we must be more inclusive in whom we admit, what knowledge we offer, and how we bring people together.

Third, higher education will become customized. We are moving from a single-peak landscape to a multipeak landscape in which institutions specialize in different educational experiences instead of chasing the same top spots in the rankings.

Fourth, another philosophical change is a greater emphasis on lifelong learning. We can’t focus only on a student’s years on campus. We must enrich the K-16 education pipeline, partnering with local school districts to create customized pathways toward excellence that assist all Virginia residents. At the same time, we want alumni to partner with us in our teaching and research endeavors, all the while learning from our faculty and students.

Most universities promise to tackle some of the transformative challenges in education at the periphery of their mission, but Virginia Tech has placed them at the core of the contemporary land-grant university—and that’s what brought me here. President Sands has a nice way of explaining why Virginia Tech is well positioned: When you look at how this community teaches, investigates, and communicates, the emphasis is on societal impact and service rather than on enriching a specific discipline alone. We understand the importance of disciplines and support them, but we also connect the knowledge arising from disciplines to real-world problems. Virginia Tech has a responsiveness to the world’s needs that is unique. Some institutions uphold an artificial, outdated binary that creating knowledge is a higher calling than preparing people to get jobs, when, of course, both can be done.

In addition to societal impact and service, Virginia Tech acknowledges the whole person. When I’m late to a 9 a.m. meeting, Tim [President Sands] makes a point to tell people I had to drop off my daughter, and everybody says, “Awww.” That’s the experience here—and I love it.

“When you look at how this community teaches, investigates, and communicates, the emphasis is on societal impact and service.”
Menah Pratt-Clarke is the vice provost for inclusion and diversity and vice president for strategic affairs. Formerly the associate chancellor for strategic affairs and the associate provost for diversity at the University of Illinois at Urbana-Champaign, Pratt-Clarke earned undergraduate and master’s degrees from the University of Iowa and master’s, doctoral, and law degrees from Vanderbilt University.

Why Here?

Two things struck me when I first visited the Blacksburg campus for search committee interviews: the university’s motto and the kindness of the community.

As an African-American woman, and someone who is not typically fond of small towns or cold weather, I needed to feel that I could live here. I needed to be able to see myself here. During that visit, I encountered a level of genuine kindness that I had never encountered before, even after living in the South for 20 years.

The Ut Prosim (That I May Serve) motto left an equally powerful impression on me. The power of the motto is a phenomenal foundation for our diversity and inclusion work, as are the university’s Principles of Community and the existing efforts to improve inclusion and diversity. These were the factors that drew me to Virginia Tech.

At Virginia Tech, the InclusiveVT framework—in which the responsibility for advancing diversity and inclusion is shared across the university community—is tremendously valuable. And the leadership of President Tim Sands and Provost Thanassis Rikakis gave me the sense that we are well positioned to move forward.

Achieving a sustainable transformation toward a more diverse and inclusive environment, however, will require a collective determination of the entire community. When we consider the history of civil rights movements and historical change in the U.S., we realize that many people with different identities and from different backgrounds came together with a fierce determination to advance a common cause. They were willing to work hard and invest time, energy, and resources to achieve change.

Such work is part of Virginia Tech’s responsibility as a land-grant institution. We must ensure that students understand the history of the U.S. and its different populations and are prepared to interact with, engage, and serve those around them. The goal should be to improve society based on a true appreciation of the issues of identity and difference.

If our motto is truly “That I May Serve,” I believe that we must do so in the spirit of inclusion and diversity.

Why Now?

The power of the motto is a phenomenal foundation for our diversity & inclusion work.
Theresa Mayer, the vice president for research and innovation, was most recently at Penn State University as a distinguished professor of electrical engineering and materials science and engineering and the College of Engineering’s associate dean for research and innovation. Mayer earned a bachelor’s degree from Virginia Tech and master’s and doctoral degrees from Purdue University, all in electrical engineering.

Why Here? Why Now?

I was an undergraduate in electrical engineering and mathematics when Virginia Tech first required students to use laptop computers. I remember lugging my computer all over campus—this was the late 1980s, years before most universities embraced this technology—and laptops then were not nearly as light and portable as they are today.

The memory comes to mind now that I have returned to Virginia Tech as the vice president for research and innovation. In those early days of personal computing, thought leaders at Virginia Tech recognized how human-computer interactions enriched the arts and sciences, and they made sure that students had those tools and knew how to use them.

That experience is a reminder of how natural it is for Virginia Tech to be on the leading edge of education and research. It’s expected. We have always been a university of action; we create and share useful knowledge; and we tackle society’s greatest challenges with the conviction of our motto, Ut Prosim (That I May Serve).

Today, as we compete in a world that has never before been so highly connected and complex, Virginia Tech is rebooting the land-grant model to serve a world in fast motion. It is thrilling to be part of that effort.

Having spent my career at land-grant institutions, I saw opportunity at Virginia Tech. First, I thought of how land-grant missions must focus on urban challenges, as well as challenges typically addressed through agricultural and mechanical arts. Unlike many of our peers, we are well positioned to make national and global impact because of our presence in the National Capital Region. We increasingly provide opportunities for students to learn and equip them to meet the information and technology needs of employers, and we offer living labs in an urban region with global reach. Considering our dual centers of influence—in Northern Virginia in addition to the innovation and economic efforts in the New River Valley—Tech truly has a dynamic reach.

The timing could not be better. Virginia Tech is on a unique upward trajectory. Because of the compelling Beyond Boundaries vision of the university’s leadership and because of the legacy of strategic research investments over the past 15 years, we are poised to make tremendous strides. In addition, student enrollment and faculty hires are on the rise.

Beyond that, Virginia Tech is a lot like I remembered it. Hokie Stone is everywhere, and Skipper still fires during special occasions. And if you see me on my way to a brainstorming session, chances are I will have a laptop with me. Some things don’t change.

Why now?

“Virginia Tech is rebooting the land-grant model to serve a world in fast motion.”
It’s a ritual as time-honored as commencement exercises themselves: Scanning a lively sea of gowns and decorated mortarboard hats in Lane Stadium this May, family members will seek out their favorite Hokie among the colorful regalia.

For parents Steve and Tina Lomaka, however, the effort will be fourfold. Their children—Greg, Steve, Chris, and Kate—will make Virginia Tech history as the first set of quadruplets to enroll and graduate from the university.

Of more than 4 million live births in 1993 in the U.S., the Lomaka quadruplets were among just 277 sets of quads born that year. While it’s nearly impossible to determine how often quadruplets attend the same university and graduate together, we do know that each of the Lomakas discovered a distinct academic path at Virginia Tech, and their paths have prepared them to take flight upon graduation.

Having met as students at Villanova University and married a year after graduation, Steve and Tina Lomaka tried for years to have a child. When told by three different sets of doctors that biological children would not be possible, the couple adopted a newborn girl they named Lauren.

After Lauren had turned 3 years old, Steve and Tina decided to meet with one more doctor and then try infertility treatments, which can lead to multiple births. On April Fools’ Day in 1993, they discovered that Tina was pregnant with three babies. A few weeks later, a fourth baby popped up on the ultrasound.

“At approximately 31 weeks into Tina’s pregnancy, the quadruplets were born. “There were probably 25 people in the operating room—doctors and nurses who worked with Tina [a labor and delivery nurse at the Philadelphia-area hospital],” Steve said. “The first one came out around 11:55 p.m. and I thought, ‘They are going to have different birthdays. There’s no way!’ But [the babies were delivered at] 11:55, 11:56, 11:57, and 11:58.”

Needless to say, “normal” was hard to pull off with quadruplets and a toddler at home. Steve worked Monday to Friday, while Tina took 12-hour weekend shifts at the hospital. Each night, they prepared 24 bottles to accommodate feedings every four hours, which required some two hours to complete.

When the quadruplets were still toddlers, Tina became pregnant, even though she had been told it was improbable without fertility treatments. Their family was complete when a son, Matt, was born. “He was a miracle baby,” Steve said. He and Tina continued their opposite work shifts so they could care for Matt, who has Down syndrome, and his growing siblings.

Before the quadruplets began school, the family of eight moved to Richmond, Virginia, for Steve’s job. Enrolled in a small Catholic school where they were known as “the quads,” Greg, Steve, Chris, and Kate became part of a tight-knit community and developed their own identities and interests.
Let the good-natured jabs and compliments commence! Independent of each other, each quad rated the other three while parents Steve and Tina and older sister Lauren rated all four. Check out the full quiz results and comments at wmgwtau.

Analyzing Steve
1. He’s definitely the loud, outgoing one.
2. He is not afraid to speak his mind and appears very comfortable with groups of people. Maybe he’s a product of a large family.
3. Steve is a talker and class clown, headstrong and lovable.
4. Steve thinks my 11 p.m. bedtime is early. He is consistently up until 2 a.m., usually getting wrapped up in Reddit/YouTube/Facebook.
5. The finger were always pointed at Steve for starting arguments. He has quick wit and a quick mouth. Luckily, he also is quick to apologize.
6. He is perceived as being the party boy, but is very diligent in his studies and responsibilities.

Evaluating Chris
1. Chris is the most stubborn and opinionated out of the four of us.
2. When he was a kid, I took him to a baseball tryout. During one run around the bases, he tripped and fell. Quite embarrassed, he finished with some tears in his eyes and went to the fielding and throwing station, where he threw these balls into the gym ceiling, nowhere near the coaches. As we left, he was crying. He showed us the arm that braced his fall—and it was broken. I commend him to this day for following through and not quitting.
3. Chris used to be the least scholarly. But he has taken more credits per semester than any of us. I’m super impressed with how Virginia Tech has pushed him to be one of the hardest workers out of the four of us.
4. Whether he was eating a bug off the floor at age 2 or crawling into a swimming pool, he gave my parents some even grey hairs.
5. Chris only needs one ingredient for any dish he makes: pesto.

Ranking Kate
1. She is extremely personable and outgoing and is probably the best listener I know.
2. Kate will say she’s introverted, but I don’t see that whatsoever. She likes her nights in, but she is very outgoing.
3. Everyone goes to Kate with their problems. She is the glue that holds the quads as one.
4. She is so conservative, in some ways, but then will do a Tough Mudder race and hang off a mountain.
5. She makes me cringe with pictures of her feet hanging off the rocks at McAfee’s Knob.

Assessing Greg
1. He’s our token nerd.
2. Greg is my most conservative. He has the biggest heart in the world and would do anything for you without you even asking.
3. Much more cautious and methodical than anyone else in the family.
4. Greg is the most naturally smart. His AOL screen name back in the day was mathwhiz1008. I think that says it all.
5. Greg is such a natural-born runner. Growing up, we would run together, and he would hold the conversation together while I was huffing and puffing. I ran my first half-marathon with 12 weeks of preparation. Greg ran his first with about two weeks of preparation—and beat my time by several minutes.

Birth order: Oct. 8, 1993

Birth weight:
2 lbs. 2 lbs. 2 lbs. 3 lbs.
2 oz. 11 oz. 13 oz. 10 oz.

Senior quotes:

Steve: “He’s definitely the loud, outgoing one.”
Chris: “Chris is the most stubborn and opinionated out of the four of us.”
Kate: “She is so conservative, in some ways, but then will do a Tough Mudder race and hang off a mountain.”
Greg: “He’s our token nerd.”

COS in Hillcrest
The quads, Tina and Steve assumed, would spread out when it came time to attend college—but that didn’t come to pass. “I always knew I wanted to go to Virginia Tech,” son Steve said. He applied early decision and received his acceptance letter in December of his senior year in high school. The following February, Greg found out he’d been accepted to Tech, though he was considering two other schools. Then, on the same day in April, Chris and Kate learned they’d also been accepted. Chris almost hadn’t applied, thinking he wouldn’t make the cut. “I purposely didn’t [visit] Virginia Tech because I didn’t want to get my hopes up,” Chris said. As the deadline to pick a school approached, each sibling was drawn to Virginia Tech. “They made the decision themselves,” Tina said. “I was sleeping [after] working night shift, and when I got up, they told me they were all going to Virginia Tech.”

In addition, older sister Lauren had already committed to the Edward Via College of Osteopathic Medicine in Blacksburg. “It was awesome to know that five of them would be in the same place,” Tina said.

On campus, the quadruplets have had unique experiences. Each pursued divergent majors in separate colleges. “We were able to maintain our own identities. Nobody ever came up to me and asked if I was part of the quadruplets at Virginia Tech,” Kate said. Beyond academics, they also enjoyed their own activities, jobs, clubs, and friends. Chris admitted that he may have tried to do too much, but he’s glad he did. “I never wanted to look back and say, ‘I wish I had done that,’” he said.

Greg, Steve, and Kate each served as a residential advisor. “I had such a good experience with the community aspect of it all [my first year]. I really wanted to pass that on to other freshmen,” Kate said. “There is no place like this school.”

Despite their diverse endeavors, the siblings took advantage of being able to meet for dinner, grab coffee, or attend one of the fitness classes Kate taught. Catching up on a whim won’t be possible after graduation, however. By mid-summer, they will be as many as 5,000 miles apart. In their lives, the quads’ farthest separation was about 1,200 miles—for only a week.
**Give them wings**

After Chris had been offered a field engineering job with Hansel Phelps in Honolulu, he gathered his siblings to discuss the opportunity. “To have that special moment—he wants us in on this big life decision because he wants us to know this is hard for him, too,” Kate said.

A few months later, Greg received a job offer from Elephant Insurance Co. He will move overseas to Wales for a year of training and then will work in Richmond.

Closer to home, Steve accepted a position with Deloitte Consulting in Arlington, Virginia, and Kate will pursue a doctorate in physical therapy at Virginia Commonwealth University.

While the quads are ironing out the logistics of their upcoming moves and are excited by what’s ahead, they also realize that the separation will be an adjustment. “For some reason, if you are part of twins or triplets or, in our case, quadruplets, everyone thinks that you are with each other all of the time. But for us, it’s not that way. We are definitely close, but have our own lives,” Chris said. “It’s exciting to see everyone branch out and find their own interests.”

“I wanted the kids to spread their wings,” Tina said. "They certainly took me up on that!”

Alison Matthiessen is the communications coordinator in the Office of the Executive Vice President and Provost.

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**On the quads:**

Don’t miss out on the longer version of the story and the full quiz results, along with videos of the quads now and as freshmen. Visit vtmag.vt.edu.
“THEY DID NOTHING TO DESERVE THIS.”

A Virginia Tech team exposes lead poisoning

water, clouded by the rusting of iron main pipes, taken from Lee-Anne Walters’ home.
In January, Lee-Anne Walters picked up two bottles of filthy, yellow water and turned to her twins, Gavin and Garrett, in a Durham Hall laboratory on Virginia Tech’s campus.

“Let’s see if you guys remember this,” she said, holding up the bottles. “Do you remember what this is? What is that?”

“THAT’S THE YUCKY WATER,” Gavin replied.

The boys understood. And their mother understood all too well.

In late 2014 at her home in Flint, Michigan, Walters was at a breaking point. The tap water was giving the twins persistent rashes. Her eyelashes had begun to fall out, as had her older daughter’s hair, and her older son suffered from abdominal pain. City testing found high levels of lead in her home’s water, but she couldn’t get further help from city and Michigan Department of Environmental Quality (MDEQ) officials.

An Environmental Protection Agency (EPA) official referred Walters to a scientist whose reputation for protecting the public preceded him: Marc Edwards, the Charles Lunsford Professor of Civil and Environmental Engineering at Virginia Tech.

By then, Walters, out of necessity, was fast becoming a citizen-scientist and advocate for Flint residents. In an April 2015 phone call, Edwards taught Walters how to properly collect water samples from her faucets. Of the 30 samples Edwards tested in his lab at Virginia Tech, the lowest lead level was 300 parts per billion (ppb). The average was 2,000 ppb, and the highest was more than 13,000 ppb.

The level regarded as actionable by the EPA was 15 ppb.

The level regarded as safe? Zero ppb.

“That was a sleepless night,” Edwards said. “We got [the testing] done within 24 hours. We didn’t believe it. We ran the samples again the next day. Unfortunately, the results were correct. It was the worst lead in water I’d seen in 25-plus years, and I’d seen a lot.”

The world now knows what happened next: Edwards and a team of student researchers determined that Flint faced widespread elevated levels of lead and dangerous Legionella bacteria; united a coalition of Flint residents and others; and helped to expose a citywide health crisis that should serve as a warning for all communities facing crumbling infrastructure.

“The MOST POWERFUL FORCE IN THE UNIVERSE”

In late January, Walters and her family traveled to Blacksburg, where she received a heroism award during a presentation by Tech’s Flint Water Study research team. In opening remarks, Provost Thanassis Rikakis called the work a stellar example of a contemporary land-grant university solving problems in a real-world context, with Flint as the classroom.

More than 300 people filled the Quellen Family Auditorium and two overflow rooms at Goodwin Hall, and 1,900 others watched a livestream broadcast to hear from the Hokies who had merged their academic skills with the spirit of Ut Prosim (That I May Serve) to champion and safeguard the health of Flint residents—affectionately known as “Flintstones”—and expose governmental malpractice.

That evening, student researchers described how they had detected high lead levels, the presence of dangerous microbes, and the lack of proper corrosion control in Flint water. Some fought back tears as they described their interactions with both frightened residents and skeptical bureaucrats who had openly questioned the Tech team’s methods and reputation and denied the existence of a problem for years. Even after the team had announced its results.

“For 18 months, 100,000 residents were exposed to toxic water,” said Siddhartha Roy, a civil engineering Ph.D. student. “They did nothing to deserve this. Nine thousand kids were potentially exposed.”

Lead poisoning causes irreversible damage: learning disabilities and mental impairment; along with a variety of physical symptoms, including abdominal pains, fatigue, headaches, loss of developmental skills, and more. In Flint, the poisoning was widespread. In some zip codes in summer 2015, 1 in 10 children had elevated blood lead levels.

Speaking in the Quellen auditorium, Roy described a call he had received from a woman who was in tears because she had given her children and grandchildren tap water. “She told me she poisoned her kids,” Roy said. “It wasn’t her fault. But a mother’s heart could never accept that. She thanked all of us for what we did. This is why we spent the last six months of our life pulling all-nighters, pulling weekends together, because we cared. And it changed who we are as human beings.”

Edwards, the driving force behind the Virginia Tech effort, turned the credit back to Flint residents—specifically Lee-Anne Walters.

“I tell my students if they learn one thing from their class, it’s that the most powerful force in the universe is a mother worried about the health of her child,” Edwards told the crowd. “If you threaten that, Mama will come and mess you up, even if you’re a powerful government agency.”
hands, introducing even more volatility to an already difficult dynamic.

In March 2013, the Flint City Council opted to stop buying water from Detroit and to join a regional water authority that would draw water from Lake Huron and send it to Flint by pipeline. While the pipeline was under construction, a process that continues today, the emergency manager decided that Flint should use the Flint River as its water source. As soon as the switch was made in April 2014, residents began complaining about the smell, taste, and color of their new water. Protesters soon packed city hall with bottles of discolored, cloudy water.

In a June 2015 memo, Miguel Del Toral, the regulations manager in the EPA’s groundwater and drinking water branch, who referred Walters to Edwards, released a memo outlining the lead levels, the timeline, and the laws (i.e., corrosion control) the city wasn’t following.

Edwards, unfortunately, recognized what could be happening. More than a decade ago, the Washington, D.C., water utility had invalidated samples that pointed to rising lead levels and had issued a report claiming the water met federal standards, while the Centers for Disease Control claimed the water was safe and that no D.C. residents had been harmed. Edwards, dubbed “The Plumbing Professor” by Time magazine in 2004, spent years fighting the agencies—with his own money and reputation on the line—in order to protect D.C. residents.

In other cities, too—Durham and Greenville, North Carolina; New Orleans; and more—Edwards has uncovered lead in the water and fought for the public. “It’s the same saga again,” Edwards said. “It’s the same ending. It’s the fifth time I’ve seen it, so it’s a little sad.”

**LEARNING FROM EXPERIENCE**

The lessons of D.C. formed the core of a three-year master’s course, Engineering Ethics and the Public, taught each fall in Blacksburg by Edwards and Yanna Lambrinidou, an adjunct assistant professor in the Department of Science and Technology Studies in Tech’s National Capital Region, who collaborated with Edwards on the D.C. crisis.

Taught since 2010, the course has had a powerful influence on the Flint team’s students, and Flint has influenced the course. The crisis served as a case study in the fall 2015 semester. Of primary importance in the curriculum is the first, fundamental canon in the National Society of Professional Engineers’ code of ethics: to hold paramount the safety, health, and welfare of the public. In recent years, however, and perhaps with increasing frequency, Edwards said, scientists and engineers avoid engagement by claiming that they only play an objective, numbers-based role. “There’s a role that scientists and engineers need to play and that society expects them to play, which is to act and react when they see wrongdoing,” Lambrinidou said. “Through inaction, you’re enabling the biggest or most powerful and oftentimes the most dangerous and harmful fish in the pool to win. You’re taking an active part in reinforcing existing infrastructures and existing imbalances and injustice by staying silent.”

Lambrinidou said that in both Washington, D.C., and Flint, residents and citizen-activists were the first to sound alarms about problems with the water. “It was ordinary people, non-experts, parents who discovered their children had elevated blood lead levels and called begging to have their service lines replaced,” Lambrinidou said. “We end up as a society and culture [creating] these narratives where we almost invariably place expert knowledge above the knowledge of ordinary people. Ignoring those [ordinary] voices is very, very risky.”
facing for Flint

In late January, the Walters family gathered with some of Tech’s Flint Water Study team for a potluck dinner at Professor Edwards’ home. When the team mobilized—going “all in for Flint,” as Edwards said—the students found themselves fighting alongside Edwards’ home. When the team mobilized—going “all in for Flint,” as Edwards said—the students found themselves fighting alongside

The Flint Water Study Team

All in for Flint: In late January, the Walters family gathered with some of Tech’s Flint Water Study team for a potluck dinner at Professor Edwards’ home. When the team mobilized—going “all in for Flint,” as Edwards said—the students found themselves fighting alongside

Names

- Owen Strom: 25, 32, 34, 36
- Maggie Carolan: 10, 24, 32, 36, 46
- William Rhoads: 5, 8, 32, 34, 36, 39
- Robert Bielitz: 14
- Siddhartha Roy: 7, 8, 20, 29, 31, 32, 34, 35, 38, 43
- Ni “Joyce” Zhu: 25, 52
- Robert Bielitz: 14
- Victoria Nystrom: 9, 22, 32, 34, 38
- Laurel Strom: 9, 32, 34, 36, 38
- Emily Garner: 8, 32, 36, 39
- Pan Ji: 8, 32, 36, 38
- Joni Metch: 11, 34
- Gavin Walters: 50
- Christina Devine: 8, 15, 32, 37
- Anuraj Martha: 8, 32, 35, 38, 40, 45, 46

NOT Pictures

- Amy Pruden: 2, 4
- Joseph Falkinham III: 3, 4
- Brandi Clark: 5, 6, 16
- Sheldon Masters: 6, 17, 28
- Jeffrey Parks: 6, 16, 18, 29, 30, 32, 35
- Kolrey Paper: 6, 19, 32
- Jake Match: 8, 32, 36
- Colin Richards: 9, 32, 34, 42
- Catherine Grey: 9, 23, 33, 35, 46
- Kim Hughes: 13, 32, 34, 36
- Rebecca Jones: 12, 32, 34
- Allison VICK: 11, 32, 34
- Maddie Brouse: 11, 33, 35, 46
- Matthew Dewild: 11, 33, 35, 46
- Sara Chergaoui: 11, 27, 33, 35, 46

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A FIRST FOR WATER

Margaret “Maggie” Carolan (right) is one of the first students to pursue Tech’s new bachelor’s degree in water—water: resources, policy, and management—a cross-disciplinary major that incorporates water science, policy, law, economics, management, and social science. Twenty-one students already have enrolled in the major, first offered in fall 2015. Carolan, a sophomore who is also majoring in geography, has received the Alumni Presidential Scholarship, along with two scholarships established by Jeff Rudd (philosophy, biology ’83); the Virginia Tech Sustainable Water Undergraduate Research Fund and the Virginia Tech Sustainable Water Scholarship.

“Water is one of the most important fields of the 21st century,” said Rudd. “The field offers a vast range of opportunities for work and study, such as establishing policies and engineering processes to conserve and recycle water, researching supply and consumption to assess the cost of water, and crafting strategies to help resolve stakeholder conflicts about ownership and use of water. The degree bridges the gaps between science and policy and theory and practice—and Virginia Tech is leading the way.”

Roles

1. Team’s faculty leader; Charles P. Lunsford Professor of Civil and Environmental Engineering, College of Engineering; and principal investigator, National Science Foundation (NSF) Rapid Response Research (RAPID) grant
2. College of Engineering professor and Graduate School associate dean and director of interdisciplinary graduate education
3. Professor of biological sciences, College of Science
4. Co-principal investigator, NSF RAPID grant
5. Helped with NSF grant proposal
6. Research scientist
7. Team’s student leader. Launched Flint-waterstudy.org; raised about $100,000 to support the team in Flint and for future work; and prepared a mini-documentary on the team’s response, designed to attract young students to environmental engineering
8. Ph.D. student, civil engineering
9. Master’s degree student, civil engineering
10. Undergraduate double major in geography and water: resources, policy, and management
11. Undergraduate, civil engineering
12. Undergraduate, environmental science
13. Biochemistry, biology ’15
14. Undergraduate, general engineering
15. Engineering science and mechanics ’14
16. M.S. environmental engineering ’12, Ph.D. civil engineering ’15
17. M.S. civil engineering ’11, Ph.D. ’15
18. M.S. environmental engineering ’01, Ph.D. civil engineering ’05
19. M.S. civil engineering ’11, Ph.D. biological systems engineering ’15
20. M.S. environmental engineering ’15
21. M.S. environmental engineering ’13
22. Biological systems engineering ’15
23. Civil engineering ’15
24. Research assistant
25. Master’s degree student, public health, Virginia-Maryland College of Veterinary Medicine
26. Civil engineering graduate student at Howard University, joining Edwards’ team in fall 2016 and pursuing a master’s in environmental engineering
27. Exchange student
28. Helped plan response to crisis
29. Prepared sampling video for residents
30. Overseas assembly, distribution, return, and pre-analysis prep of lead test kits and coordinated various sampling efforts
31. Conducted sampling in Flint
32. Assembled, processed, and analyzed lead testing kits
33. Distributed and collected lead test kits
34. Prepped test kits for analysis
35. Communicated with residents about testing
36. Assembled, processed, and analyzed microbial testing kits
37. Compared the corrosiveness of Flint water to Detroit’s and, via webcam, demonstrated the tests for Flint elementary school students who replicated the experiments
38. Freedom of Information Act requests and analyses
39. Tuition remission in support of studies
40. Handled logistics, managed data, raised money to distribute filters, oversaw social media outreach and correspondence
41. Compared Virginia Tech data to Michigan Department of Environmental Quality data
42. First trip to Flint
43. Second trip to Flint
44. Third trip to Flint
45. Fourth trip to Flint
46. Fifth trip to Flint (spring break)
47. Marc Edwards’ wife
48. Marc Edwards’ daughter
49. Rebekah Martin’s husband
50. Lee-Anne Walters’ family
51. Citizen-scientist

Virginia Tech Magazine spring 2016
By listening to and collaborating with local experts and mobilizing to address the complex problem on-site, the Tech research team perfectly embodies the powerful model for problem-solving that few institutions, apart from the contemporary land-grant university, have offered. In fact, water as an area of excellence is an emerging priority for Virginia Tech.

In a May 2015 speech on academic freedom that Edwards delivered just before analyzing Walters' water samples, the professor quoted Abraham Lincoln, who established the land-grant university system by signing the Morrill Act: “The system is being built on behalf of the people, who have invested in these public universities their hopes, their support, and their confidence.” Added Edwards, “The 21st century will surely provide us with many opportunities to prove ourselves worthy of the people, their hope, and confidence... but only if we can find the courage and strength to act on our convictions.”

**BORN HEROES**

In September and October 2015, Virginia Tech team members poured themselves into the Flint effort, pushing forward on multiple fronts. One game-changer, they said, was when Mona Hanna-Attisha, a pediatrician at Flint’s Hurley Medical Center, announced her findings. With access to citywide blood testing data and the Virginia Tech testing results posted online, Hanna-Attisha identified an increased incidence of elevated lead levels in infants and children. And the children whose blood displayed the worst increases in lead lived in neighborhoods that matched the areas where the highest levels of lead had been detected by Tech’s August sampling of 300 sites.

Hanna-Attisha’s findings underscored the direct impact on the health of children, whose developing bodies are especially susceptible to the dangers of lead, and accelerated the public health response: Genesee County and Flint officials declared public health emergencies, while Michigan Gov. Snyder announced $1 million in state funding for water filters in Flint (24,000 were handed out), along with immediate testing at city schools, expansion of lead testing for individuals, and expediting treatment of Flint water to control pipe corrosion. Snyder soon announced a multimillion-dollar plan for reconnecting Flint to Detroit water.

Guyette called the Flint situation the most meaningful project of his journalism career. “It’s kind of a double-edged sword in some ways. At the root of this is a tragedy: kids needlessly lead poisoned. That is the dark shadow hanging over all of this. But on the other hand, Marc, the students at Virginia Tech, the grassroots activists in Flint, me with my reporting—what we did do was stop [the tragedy] from going forward.”

The Tech team found themselves positioned to tackle a tremendously complex situation that stretched across traditional academic boundaries. Schwake said the team’s involvement went far beyond the basics. “It’s not just engineering. It’s not just the water industry. It’s not just public help. It’s also very much socioeconomic and political. The whole situation came about because of a lack of funds and decisions by government agencies. There’s also the social justice factor: that Flint is a very poor city with a lot of minorities and [did not have] the best water quality to begin with.”

Underlying all of those factors is the human element. At a supper in Flint, civil engineering Ph.D. student Rebekah Martin asked a pair of activists about their motivation. “They said, ‘This is our home,’” Martin recalled. “‘We’re not going to let our families be walked over and not heard when they’re being poisoned.’” The sentiment points back to the first canon of civil engineering—to protect the public. “As engineers,” Martin said, “a lot of times we sit in offices and design things. Or you may have some formula that goes into treating water or designing a system to treat water, but you don’t talk to the people who drink that water or who will be affected by what you’re designing. It’s important to get out there and listen to people.”
Edwards said Flint was a perfect example of how science failed at first, and science-based advocacy worked—and worked quickly. But because he has seen history repeat itself, he is realistic and cautious. “We are capable of learning something, but I’ll believe it when I see it … As long as lead pipes are there, it’s a time bomb waiting to go off.”

In the Engineering Ethics and the Public course, Edwards and Lamberdinosi help students understand who they want to be when—not if—they face an ethical dilemma. And as Edwards told the Goodwin Hall crowd, society must set its priorities to repair crumbling infrastructure, and individuals must display the courage to stand up and take action.

Said Edwards, “I maintain that people are born heroic.”

Heroism can surface anywhere—in Flint residents or in a Blacksburg classroom. “You don’t have to be running for president. You don’t have to be a Nobel laureate,” Ph.D. student Pan Ji said during the Goodwin Hall presentation. “You can just be a normal person fighting for a just cause.”

In depth:
For more on the Flint story and Marc Edwards—including the professor’s 2013 TEDxVirginiaTech talk, “Heroic by nature, cowardly by convenience”—visit vtmag.vt.edu and vt.edu/flintwater and use the hashtag #VTFlintWater.

For more on how the university approaches complex societal problems within its areas of excellence, such as water, visit beyondboundaries.vt.edu.
I love campus in the spring. Like a sleeping giant awakening, the campus comes alive. Runners, walkers, bicyclists, dogs, children, and sports enthusiasts magically appear on the Drillfield, around the Duck Pond, on tennis and basketball courts, on intramural fields, and at other campus outdoor spaces.

The Blacksburg campus, named the prettiest college campus in America in a February social media contest, is beautiful year-round. However, in the spring when the flowers and trees bloom, it is just spectacular.

Spring is also the most exciting time of the year in the Virginia Tech community. Juniors look forward to Ring Dance, a tradition dating from 1934, that ends with a ring exchange and students sporting their shiny, new jewelry and enjoying an elaborate fireworks display over the Drillfield. We also celebrate the accomplishments of our soon-to-be graduates as they conclude their senior years. Hokie bucket lists are completed, awards and scholarships are presented, career fairs are attended, and interviews are scheduled.

In May, Virginia Tech will send about 5,500 new Hokies into the world. These new graduates will make their impact through new jobs and serving their communities, honoring our motto, Ut Prosim (That I May Serve). As students at Virginia Tech, they have received a world-class education and training through experiences that are unique to the Hokie Nation and shared by about 250,000 alumni.

We want our new alumni to connect with Hokies living around the world and remain attached to their alma mater, giving back through mentorships and scholarship support, providing jobs and internships to fellow Hokies, and contributing to the success of new Destination Areas being identified by President Tim Sands. Giving back to Virginia Tech is how we give back to the world.

Lyrics taken from our alma mater seem especially appropriate today:

Happy spring to all!

Matthew M. Winston Jr. (marketing management ’90) is senior associate vice president for alumni relations.
Exhibit honors black alumni artists

An exhibition featuring the works of three Virginia Tech alumni artists is on display at the Holtzman Alumni Center through mid-May.

Natalie Titus (biology ’88, D.V.M. ’91), Stanley Barner Jr. (sociology, fine arts ’09), and Rhakim Smith (fine arts ’15) were recognized at a reception kicking off the magnificent, breathtaking scenes, but beauty that exists all around us, not just in art photographs almost as much as she loves animal portraits, she was named VVMA Mentor of the Year in 2015.

Additionally, for several years she has volunteered as an alumni interviewer for prospective veterinary students at Virginia Tech. A role model to numerous veterinary students, she was named VVMA Mentor of the Year in 2015. Legacy in letters

Do you still have your Virginia Tech acceptance letter? The Burriss family of Virginia Beach does. Proud parents Lisa (communication ’91) and Dean (liberal arts and sciences ’89) posed with their daughter, Ashley, a member of the Class of 2020 holding her 2016 letter. Said Lisa, “We’re so glad we kept the letters all these years.” Unfortunately, her father, Wayne Hanks (business ’63), tossed his letter many years ago.

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Natalie Titus (biology ’88, D.V.M. ’91), Stanley Barner Jr. (sociology, fine arts ’09), and Rhakim Smith (fine arts ’15) were recognized at a reception kicking off Black History Month and the exhibition.

Titus, who practices veterinary medicine at Haven Lake Animal Hospital in Milford, Delaware, said she “loves photography almost as much as she loves animals.” In her eight photographs in the exhibit, she said she attempted “to show the beauty that exists all around us, not just in the magnificent, breathtaking scenes, but also in the small, silent moments that tend to slip by unnoticed and not remembered.”

Barner Jr., of Chesapeake, Virginia, considers himself to be a conceptual artist whose work is based on socio-economic happenings; he said he aims “to present these prevailing themes in a way that invokes thought and emotion in order to empower or incite change in views or behavior.” His works on display, crafted in oil, watercolor, acrylic, paper, and wood, focus on the black male experience.

Smith, a native of Hampton, Virginia, uses primarily pencil and ink to create drawings of some of his closest friends and most sentimental moments. “Pencil was the first drawing utensil I ever used, and I feel as if it’s the most basic tool you can use to convey any idea,” said Smith, who is pursuing a master’s degree at the Savannah College of Art and Design in Atlanta. His seven submissions feature graphite, ink, and watercolor.

The alumni center’s second-floor gallery is free and open to the public from 8 a.m. to 5 p.m. Monday through Friday.

New face of civil engineering

Environmental and water resources engineer Rajan Jha (M.S. civil engineering ’13) has been named one of 2016’s New Faces of Civil Engineering Professionals by the American Society of Civil Engineers, the oldest engineering society.

He will represent civil engineering, along with honorees from other engineering societies, in the New Faces of Engineering program, which recognizes the talents of the next generation of engineering leaders.

A native of India, Jha now lives in Richmond, where he has worked for ARCADIS US since receiving his master’s degree at Tech. “Virginia Tech changed my life,” Jha said. “People I met there made me believe that I am special and that I can make a difference.” And he is making a difference, solving water resources problems around the world, from India to the U.S. to Zambia.

Jha has a passion for real-world water and sanitation challenges and works to bring sustainable solutions to these environmental concerns. His technical skills lie mainly in exploring the physics and philosophies behind river-flow behavior and how the flow can be returned to its natural state of equilibrium. Actively involved with the Water for People and Engineers Without Borders organizations, Jha planned, monitored, and evaluated lead levels in a Zambian school water supply system. Jha has also mentored student engineering chapters from Virginia Tech, Virginia Commonwealth University, and James Madison University on community-based projects, such as the design of a bio-sand filter in Honduras and wastewater management for a Guatemalan school.

A veterinarian and mentor

Claudia True fell in love with horses as a 9-year-old when she visited Chincoteague Island and rode a pony there. At age 11, she started riding regularly, and she received her first horse at age 16.

Fast forward to today: The Fairfax County native was recently named the Virginia Veterinary Medical Association’s (VVMA) Veterinarian of the Year.

A double Hokie, True (biology ’81, D.V.M. ’86) completed an internship at Texas A&M University and then began practicing at Woodside Equine Clinic in Ashland, Virginia, where she still works today.

True’s career has been highlighted by her willingness to serve. In addition to sitting on the Virginia Tech Alumni Association board, she has been president and a director of the VVMA board and president of the Virginia Association of Equine Practitioners. She is a founding veterinarian of the Potomac Regional Veterinary Conference and has served as Virginia’s equine program committee member since 2011.

Additionally, for several years she has volunteered as an alumni interviewer for prospective veterinary students at Virginia Tech. A role model to numerous veterinary students, she was named VVMA Mentor of the Year in 2015.

Virginia Tech Magazine spring 2016
Dedicated Hokies gather with like-minded friends on the 2015 Coastal Alaska cruise.

More than 100 Virginia Tech alumni, students, and university staff convened in Richmond in early February for the 18th annual Hokie Day at the Virginia Capitol. Hosted by the Richmond Alumni Chapter, the group first gathered at the Richmond Crowne Plaza, where President Tim Sands and others spoke about state funding initiatives that support the university.

Students also heard directly from two alumni legislators: Sen. Mark D. Obenshain (economics, history ’84) and Sen. Amanda F. Chase (business ’92). The experience was an “amazing opportunity for Hokies to meet with Virginia Tech alumni involved with state politics,” said biological systems engineering Ph.D. student Chelsea Corkins.

The group then ascended to The Hill, where they met with General Assembly senators and delegates and advocated for Virginia Tech priorities. After gathering on the Capitol steps for an official photo, the group was surprised by Gov. Terry McAuliffe, who announced that Feb. 4 was “Frank Beamer Day” and presented the newly retired coach and 1969 alumnus with a state proclamation.

And that was just the beginning. Coach Beamer was then escorted into the Senate chamber, where Del. Joseph Yost presented a joint resolution commending Beamer for his coaching career and for guiding the Hokies to 22 straight winning seasons and 22 consecutive bowl appearances. The beloved coach received a standing ovation from the lawmaking body—and Hokie Day participants experienced a day they’ll not soon forget.

Upcoming Alumni Association events

Drillfield Series, Human and Animal Health: We’re All In This Together, June 10-11: Learn how human and animal medicine are tied together in an interactive program with experts from the Virginia Tech Carilion School of Medicine, Virginia-Maryland College of Veterinary Medicine, and Edward Via College of Osteopathic Medicine. $99 per adult, $49 high school ages and below.

Drillfield Series, A Day in the Life of College Admissions, July 8-9: Parents and their 2017 and 2018 high school graduates will get a behind-the-scenes look at the admissions process. $130 per adult, $100 per student.

Visit alumni.vt.edu/drillfieldseries to register and learn more. Secure the special alumni lodging rate of $117 per night at The Inn at Virginia Tech (based on availability; taxes not included).

Old Guard Alumni Reunion, May 18-20: Hokie alumni who graduated in 1965 and earlier are invited to return to campus for special anniversary dinners, college breakfasts, and more. For a tentative schedule of events and to register, visit alumni.vt.edu/oldguard.

Hokie treks

Travel with the Hokie Nation

Why travel with the Virginia Tech Alumni Association? We’ll introduce you to fascinating cultures and breathtaking sights in the company of fellow Hokies and friends. We offer secure travel with top tour operators in the industry—and we guarantee lifelong memories. View our complete list of alumni travel tours at alumni.vt.edu/travel.

June

4-13 | Southern Culture and Civil War
5-14 | Southwest National Parks
13-24 | Regal Routes of Northern Europe
25-July 3 | Mediterranean Crossroads

July

12-23 | Baltic and Scandinavian Treasures
22-30 | Town and Country Life: Oxford, English Countryside, Cotswolds
25-Aug. 4 | Alaska Passages

August

11-17 | Canadian Rockies Parks and Lodges
22-31 | The Magnificent Great Lakes
25-Aug. 4 | Alaska Passages

September

17-25 | Great Pacific Northwest

October

1-9 | Grecian Delights
2-11 | Symphony on the Blue Danube
6-14 | Cuban Discovery
8-16 | Captivating Mediterranean
14-22 | European Empires and Artistry
23-31 | Country and Blues

November

1-9 | Adriatic Gems

December

6-17 | Holiday Markets

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Connect with local Hokies

Hokies participate in alumni events around the world every day. Join your local chapter for community service projects, career networking opportunities, young alumni events, raising money for student scholarships, cheering on Virginia Tech athletic teams, and more! Find your local Hokies at alumni.vt.edu.

Forty members of the Dallas/Fort Worth Chapter served the Fort Worth Community Food Bank by stuffing grocery bags and sorting food items. First State (Delaware) Hokies gathered for the annual Polar Bear Plunge to benefit Delaware Special Olympics. Alumni in Kaiserslautern gathered for their first Hokie Meet-Up in Germany.

The Denver Chapter hosted its fourth annual A-Basin Beach Party, with more than 100 Hokies hitting the slopes. Alumni in Charleston, South Carolina, cheered on the Hokies when the baseball team took on the Citadel. Charlotte Hokies volunteered at the Crisis Assistance Ministry’s Free Store to sort, inspect, and hang donated clothing.

Go to vtmag.vt.edu to see additional photos from the Tidewater Chapter, which turned out in full force to cheer on Coach Frank Beamer and the Hokies during the 2015 Independence Bowl, and the National Capital Region Chapter, which hosted a First Friday Black Alumni Happy Hour and Mixer to recognize Black History Month and mark the 50th anniversary of the university’s first black women graduates.

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Virginia Tech Magazine spring 2016
There are some people who enjoy the comfort of employment at a big company with a boss, minimum risk, and a pension. And then there are entrepreneurs like Ben Barokas. Ever since he was a boy cleaning out gutters and painting houses, he knew he wanted to be his own boss, and control his own future. After recently selling one of the latest companies he helped start (Have there been five or six? Sometimes he loses count.) for a reported $400 million, it’s clear not only that Barokas (agricultural and applied economics ’96) has learned a thing or two about entrepreneurship, but that he relishes the challenges.

“We all work way too much not to love what we do,” said Barokas. “You have to find something you are passionate about and dive into it head-first and roll around in it. You have to learn new things every day.”

Barokas’ journey to self-made international businessman is a circuitous one that started in Colombia, made a stop at Virginia Tech and the community, so she encouraged her son to apply. Barokas had been to an all-sports camp at Tech and fondly remembered the outdoor activities, especially the rolling Blue Ridge Mountains, so he listened to Mom. Before long, he was in Blacksburg studying global agricultural economics while riding horses and hiking with his Great Danes on the weekends. Agricultural and applied economics Professor Jeff Alwang said he could tell that Barokas had big plans early on. “He had his wheels spinning all the time,” Alwang remembers. “He was friendly and outgoing and seemed to have a plan without knowing it himself.”

Barokas spent a semester studying economics in Budapest and summers working at the U.S. Department of Agriculture’s Foreign Agricultural Service. But the entrepreneurial bug was biting at him, so he took a semester off and tried to launch a record label. “It allows you to create an environment in which people want to excel and are proud to be passionate.”

“Take big swings at the ball.”

Jeff Alwang said he could tell that Barokas had big plans early on. “He was friendly and outgoing and seemed to have a plan without knowing it himself.”

Barokas returned to the states and began working at AOL, where he started to learn—and excel in—the world of online advertising. He was a founding employee of a start-up called Fifth Street which went bankrupt and another called JumpTV that he also opened an internet café. But when the coffee shop down the block was blown up in a terrorist attack, it was a hard sell to get anyone to come to his. He closed the café, but kept plugging away on other ideas.

“Owning your own business allows you to curate your own community and chose the people you work with who have ambitious goals and driven to change the world,” he said from his home in New York City. “It allows you to create an environment in which people want to excel and are proud to be passionate.”

And if he could offer any advice to a young Ben Barokas siting in a Virginia Tech classroom and dreaming of what his future may hold?

“Take big swings at the ball.”

Zeke Barlow is the College of Agriculture and Life Sciences’ assistant director of communications.
Eight Things Horse Racing Stewards Do

Odds were squarely at even money that Erin Higgins (animal sciences ’09, M.S. ’11), a native of Saratoga Springs, New York, would pursue a career in the thoroughbred horse racing industry.

The daughter of a trainer and an exercise rider—and the great-niece of National Museum of Racing’s Hall of Fame trainer Charlie Whittingham—Higgins made history last year as the first female to serve as a steward at the New York Racing Association’s three tracks: Aqueduct, Belmont, and Saratoga.

Having completed the Racing Officials Accreditation Program in 2014, Higgins currently serves New York State Gaming Commission as the alternate steward at Finger Lakes Racetrack in Farmington.

1) It is standard practice for a racetrack to have three stewards who oversee races, much like referees in other sports.

2) During each race, the stewards watch for any incident or infraction, including issues at the start line, that may have affected the race’s outcome.

3) If an incident or infraction occurs during a race, the stewards will launch an inquiry. Jockeys can also lodge an objection against another rider or horse if they feel their horse’s progress was impeded. As with all competition, fouls do occur.

4) Upon an inquiry or claim of foul, the stewards review the race video—multiple angles of each race are recorded by cameras placed in various spots around the course.

5) By way of a phone near the finish line, the stewards also talk to the jockeys involved.

6) Based on the information gathered, the three stewards decide whether to disqualify the horse in question.

7) Stewards can suspend jockeys for infractions during the course of the race.

8) To ensure compliance with all rules and regulations, stewards also serve as a regulatory body overseeing the conduct of all licensees at the track, including jockeys, trainers, owners, and grooms.

To view a race that triggered a stewards’ inquiry, go to vmag.vt.edu.
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**Balancing acts**

As manager of Monomoy National Wildlife Refuge, a trio of islands stretching eight miles off the elbow of Cape Cod, Matthew Hillman (M.S. fisheries and wildlife sciences, 2012) maintains critical habitat for migratory shorebirds, sea ducks, spawning horseshoe crabs, and a variety of other protected species—but also educates local residents and governments. Here’s how he achieves that balance:

1. **Educate the public about Monomoy’s ecological role and recreational activities consistent with that role.** “We help people understand uses appropriate to the refuge—canoeing, kayaking, hiking on the islands, birdwatching. We want people to understand why the refuge is so important, on a hemispheric scale, as a crucial place for birds not only to nest, but to stop over during migration.”

2. **Draw the line when necessary—and use the moment as an opportunity to teach.** “To use the example of prohibiting kiteboarding, there are places where people can kiteboard on Cape Cod, but the wildlife refuge is not an appropriate place. It falls on us to educate those users as to why.”

3. **Emphasize the positives that come with the wilderness designation, the highest level of federal land protection.** “Visitors don’t have to deal with anything like a weed whacker or ATV driving by. It’s rare to have a 8-mile stretch of beach that’s completely natural—no sea walls, no vehicles. You can go and experience this wilderness character for yourself, which many of our visitors really love.”

For the full story, visit vtmag.vt.edu.

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**'69** Robert A. Archer (MKTG), Stable, Va., was elected to the Virginia War Memorial Foundation Board of Directors.

**'69** Jon W. Meredith (AST, 24E, ’75), Blackburn, Va., received the Virginia Trade& Commerce Innovator of the Year Award from the Virginia Conference on World Trade.


**'70** David C. Russell (GEOIL, BAD ’72), McBain, Fla., wrote a novel, “The Ancient Contracts.”

**'71** D.J. Berts (BAD), Hyderdale, Calif., 9/10/15.

**'71** Mary L. Peter (BIOL), Silver Spring, Md., 9/8/15.

**'71** Thomas E. Johnson (EE ’71), Orange, Va., 9/8/15.

**'71** Thomas V. Mukai (EE), Alexandria, Va., received the project management professional certification from the Project Management Institute.

**'71** Daniel W. Rissell (GEOIL), Farmville, Va., 11/22/15.

**'72** Suzanne Peery (EE), Savannah, Ga., 9/15/15.

**'72** D.J. Bertz (BAD), Hyderdale, Calif., 9/10/15.

**'72** Mary L. Peter (BIOL), Silver Spring, Md., 9/8/15.

**'72** Thomas E. Johnson (EE ’71), Orange, Va., 9/8/15.

**'73** Linda Swart (GEOIL), Alexandria, Va., is the U.S. ambassador to Barbados, with responsibilities for St. Kitts and Nevis, Saint Lucia, Antigua and Barbuda, Dominica, Grenada, and St. Vincent and the Grenadines.

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For the full story, visit vtmag.vt.edu.
What’s a Hokie spouse of 40 years to do after all these years of Hokie football? Knit a score-board scarf for the 2015 season! I watched every game, knitting as the scores unfolded. . . . Why a B-plus? It was great to commemorate Coach Beamer’s last season, but I wish we would’ve won more games.”

—Michelle Trahan, wife of Jim Taylor (architecture ’72), got the idea from scoreboardkal.com. Michelle loaned the scarf to their friends Jim and Linda Hinson, who will show it off in Lane Stadium this fall.

Maroon: 403 rows, one for each Hokie point
Orange: 342 rows, one for each opponent point

Grade: B+

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7 wins
6 losses

8’6” long

Center for the Arts at Virginia Tech (Miss Art Center) $75

Michael K. Williams ’97 and Mandy Terrill, Suffolk, Va., 9/26/15.

“The biggest mishap on the wedding day was losing to East Carolina in football—and rain, so [the wedding] had to be indoors.”

—Michael Williams

“Virginia Tech football is one of our favorite things in life, as I grow up going to games. Wife’s middle name is in honor of Lane Stadium because it is symbolic of our beloved alma mater that brought us together and the lifetime of memories we’ve made there.”

—Courtney Anderson

class notes

Offering the most extensive collection of original watercolors, giclées, etchings and offset lithographs by P. Buckley Moss, America’s most celebrated living artist and Virginia Tech’s own Outreach Fellow for the Arts.

Kevin Patrick (PSCI), Blacks, Colo., authored a political thriller, “Unholy Alliances.”


William “Tore” West Jr. (HORT), Mechanicsville, Va., 11/20/15.

75 Michael F. Hochella Jr. (GEOL, GEOL ’77), Blacksburg, Va., received the 2016 Outstanding Faculty Award from the State Council of Higher Education for Virginia. Benjamin M. Tomlin III (MKTG), Pensacola, Fla., was part of Gulf Power Company project team that was awarded a 2016 sustainable design award by the Precast Concrete Institute.

Linda J. Allen (EDIC) ’76, Neshannock, Pa., 8/14/15.

Ralph W. Petroski (HED ’76), Blacksburg, Va., 8/27/15.

Mary Whaley (EDIC) ’76, Har-
m Kerwood, Va., 10/31/15.

76 John A. Coster II (PADI), Horseheads, N.Y., authored a book, “Casting on Campus: History of Hilly-
rd School in the United States.” Deborah Ayes Koller (BRL), Chesapeake, Va., was inducted into the Virginia Tech College of Science Hall of Distinction.

Wililin N. Klumczak (EE), Souza, Md., 8/17/15.

Dabny T. Waring (ECON), Char- lesmont, Va., 11/2/15.

77 Mary F. Raptopis (FW) ’78, Laramie, Wyo., authored a book, “Altitude Adjustment: A Quest for Home, Honor, and Healing in the Tetons,” that appeared on the New York Times’ hardcover best-seller list for non-fiction. It was named the Northwest Regional Council Independent Book of the Year and was added to the Foreword Review’s 2014 INDIEFAB Book of the Year gold winner in the biography and memoir category.

Margaret “Peggy” Hilton Caronna (MKTG), Parkersburg, W.Va., 7/25/15.

Stephen P. Griffin (CS), Berkeley- wood, Va., 8/20/15.

Anna Baldwin Heck (EBHS ’78), Hawaii Kai, WA, 9/1/15.


Robert S. Munson (FW), Ashland, Va., 9/7/15.

78 Michael K. Williams (ECON), Blacksburg, Va., was named Alumnus of the Year by the Virginia Tech Alumni Association.

Daryl J. Hodge (EE), Arnold, Md., retired after 35 years with the National Security Agency.

Grade: B+

Fan knits season’s scores

Michael K. Williams ’97 and Mandy Terrill, Suffolk, Va., 9/26/15.
Through "The Alumni Insurance Program," Hessies can take advantage of insurance plans that sting when you with
you need them, unlike most employer plans.

Call 1-800-922-1246 today or visit www.TheAlp.com/VT for a full list of products including Life, Health, Auto, Home, and Travel.
**Hindsight**

A superintendent’s first classroom

“I was so excited to have my first classroom. I spent countless hours decorating the room and composing these grand lesson plans. However, after my first year, I realized that I should have invested some quality time learning strategies on exhibiting patience, persistence, personalized learning, and grading. I learned these lessons the hardest way possible—trial and error.”

—A. Katrina Peers (Ed.D., educational leadership and policy '14), the National Association of School Superintendents' 2015-16 Superintendents of the Year, reflecting on what she wished she had learned on her first day of teaching in 1994.

26 years ago, students’ technology needs in their dorm rooms were quite different from today’s needs.

28 years ago, the Virginia Tech Transportation Institute (VTTI), then called the Center for Transportation Research, was founded. Shortly after, Tech began developing plans for the Smart Road, an “electronically monitored highway of the future.” Today, VTTI leads the way in autonomous vehicle technology.

30 years ago, Virginia Tech celebrated Founders Day for the first time. A superintendent’s vision of an educational institution for students thought a sailing seedboard might be a creative way to get around campus.

30 years ago, students thought a sailing seedboard might be a creative way to get around campus.

**BY KIM BASSLER ’12, UNIVERSITY LIBRARIES COMMUNICATIONS COORDINATOR. IMAGES COURTESY OF LIBRARIES’ SPECIAL COLLECTIONS; MORE CAN BE FOUND AT IMAGEBASE.LIB.VT.EDU.**

**- 12 - LIBRARY UNIVERSITY LIBRARIES COMMUNICATIONS COORDINATOR. IMAGES COURTESY OF LIBRARIES’ SPECIAL COLLECTIONS; MORE CAN BE FOUND AT IMAGEBASE.LIB.VT.EDU.- 12 -**
**13** John W. Goodman (HBF), Miami, Fla., was named the Hokie Hero for the football game versus the University of Miami.

**14** Rebeca S. Alvarado (ECE, CS), Austin, Texas, was named the Hokie Hero for the Independent Bowl game versus the University of Tulsa.

**15** Nicole B. Craig (CS), New York, N.Y., was named the Hokie Hero for the Spring Game versus the University of Virginia.

**16** Michael A. Jordan (ME), Arvada, Colo., was named the Hokie Hero for the football game versus the University of Colorado.

**17** Thomas W. Johnson (EC), Newport News, Va., was named the Hokie Hero for the basketball game versus the University of Virginia.

**18** Andrew R. Ross (ME), Wilmette, Ill., was named the Hokie Hero for the football game versus the University of North Carolina.

**19** Rachel L. Browne (CHE), Citrus Heights, Calif., was named the Hokie Hero for the football game versus the University of Arizona.

**20** Eric A. Martinez (ME), Houston, Texas, was named the Hokie Hero for the football game versus the University of Texas.

**21** Jennifer L. Rodriguez (ME), Woodland, Calif., was named the Hokie Hero for the football game versus the University of Washington.

**22** Josh A. Long (ME), Austin, Texas, was named the Hokie Hero for the football game versus the University of Texas-Austin.

**23** Jason L. Miller (ME), Fort Lauderdale, Fla., was named the Hokie Hero for the football game versus the University of Florida.

**24** Sarah M. Hulse (ME), San Diego, Calif., was named the Hokie Hero for the football game versus the University of California.

**25** John J. Scott (ME), New York, N.Y., was named the Hokie Hero for the football game versus the University of Notre Dame.

**26** Samantha L. Davis (ME), Fort Worth, Texas, was named the Hokie Hero for the football game versus the University of Oklahoma.

**27** Rebecca A. Ford (ME), Lake Park, Fla., was named the Hokie Hero for the football game versus the University of Georgia.

**28** Elizabeth G. Brown (ME), Naples, Fla., was named the Hokie Hero for the football game versus the University of Florida.

**29** Michael J. Dill (ME), El Paso, Texas, was named the Hokie Hero for the football game versus the University of Texas.

**30** Sarah L. Cook (ME), Orlando, Fla., was named the Hokie Hero for the football game versus the University of Florida.

**31** Kevin L. Johnson (ME), Austin, Texas, was named the Hokie Hero for the football game versus the University of Texas.

**32** Jennifer L. Rodriguez (ME), Woodland, Calif., was named the Hokie Hero for the football game versus the University of California.

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Homecomings

September 3
Liberty
College of Agriculture and Life Sciences

September 17
Boston College
Corps of Cadets
Virginia-Maryland College of Veterinary Medicine

September 24
East Carolina (University homecoming)
Holtzman Alumni Center Open House and Tailgate
College of Engineering
College of Architecture and Urban Studies
Highty-Tighty alumni
Marching Virginians alumni

September 20
Miami (Thursday night game)
College of Science
Multicultural alumni

October 24
East Carolina
Class of 1966 – 50th reunion

October 20
Miami (Thursday night game)
Class of 1971 – 45th Reunion
Class of 1976 – 40th Reunion

November 12
Georgia Tech
Class of 1991 – 25th Reunion

November 26
Virginia
Class of 1981 – 35th Reunion
Class of 1986 – 30th Reunion

alumni.vt.edu/reunion